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CHAPTER 23

Enhancing Language and Communication Development: Theoretical Foundations

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Communicative competence may be the primary factor determining the extent to which individuals with autism and Pervasive Developmental Disorder (PDD) can develop relationships with others and can participate in daily activities and routines at school, at home, and in the community. The level of communicative competence achieved by persons with autism and PDD is closely related to the development of social behavior (Garfin & Lord, 1986) and measures of outcome (Lotter, 1978; McEachin, Smith, & Lovaas, 1993). Moreover, gains in communication skills seem to be directly related to the reduction of challenging behavior (Carr & Durand, 1986; Smith, 1985).

Providing effective programming for communication enhancement for individuals with autism and related disorders is an extremely challenging endeavor. Although there is a clear consensus on the importance of enhancing communication abilities for persons with autism and PDD, intervention approaches vary greatly and may even appear diametrically opposed to the specific goals and procedures that are advocated. Past efforts at speech and language intervention have focused primarily on the form or structural dimensions of speech and language: that is, on building labeling vocabulary, phrases, and clauses through repetition and rote training. However, individuals with autism and PDD are most challenged by their limited understanding of the conventions of communication, including its communicative and cognitive functions. In addition to limitations in the development of conventional gestures and words, difficulties in the social use of nonverbal and verbal behavior have a major impact on communicative effectiveness (Prizant & Wetherby, 1987). Because of these dual challenges, the focus of communication enhancement efforts must be the development of functional communication abilities, rather than just the development of communicative means or behaviors.

The developmental and social-cognitive differences associated with autism and PDD must also be taken into account. The social-cognitive style demonstrated by many individuals with autism and PDD has a profound effect on the acquisition of symbols and communication systems, and possibly an even greater effect on the ability to use language effectively in social interactions. Caregivers and practitioners—and, indeed, persons with autism and PDD—are challenged by a complex interaction of communicative and language limitations, behavior problems, and an uneven profile of learning strengths and weaknesses. Such cognitive discrepancies—as reflected by the ability of many persons to reproduce, by rote, memorized speech in specific contexts—may mask the true communicative limitations and may result in challenging behavior that arises when expectations about a person's ability to communicate are unrealistic. This chapter examines communicative and social-cognitive differences from a communication enhancement perspective. The intent here is to establish the conceptual and philosophical basis for the next two chapters, in which more specific guidelines for assessment and communication enhancement are provided.

SOCIAL COMMUNICATION FRAMEWORK: A TRANSACTIONAL PERSPECTIVE

Approaches to communication enhancement must be rooted in sound theory or philosophy (Prizant & Wetherby, 1989); otherwise, clinical efforts will be unsystematic, ineffective, or inefficient, and may be frustrating to all involved. The philosophy should emphasize and focus on the social-affective basis of verbal and nonverbal communication in real-life contexts, rather than merely on the structural dimensions of speech and language training received in artificial and contrived settings (e.g., training of speech repetition). Professionals who wish to work effectively with individuals with autism and PDD must understand how and why these individuals communicate. Enhancing communication is not merely a matter of expanding a repertoire of words and sentences. Such skills are mostly superfluous if an individual has limited understanding of how to use them in a communicative interaction. This section addresses the importance of understanding the learning style and characteristics of individuals with autism and PDD in order to make an effective communication enhancement effort. Later sections review pertinent issues underlying the advocated intervention philosophy and approaches, which will be discussed in detail in Chapter 24 (on nonspeaking individuals) and Chapter 25 (on persons at language levels).

Understanding Communication in Autism and PDD

Earlier publications have suggested that the constructs of *intentionality* and *conventionality* contribute significantly to understanding communicative behavior of persons with autism (Prizant & Wetherby, 1987; Schuler & Prizant, 1985). Bates (1979) defined communicative intent as "signaling behavior in which the sender is aware a priori of the effect that a signal will have on his listener, and he persists in that behavior until the effect is obtained or failure is clearly indicated" (p. 36). However, not all communicative behaviors are intentional. Any behavior can serve a communicative function, regardless of whether the effect was intended (Dunst, Lowe, & Bartholomew, 1990). Alternatively, communicative behavior may fail to accomplish the purpose or function originally intended. Communicative competence is greatly determined by the ability to evaluate and monitor one's own communicative effectiveness and, when necessary, to fix or "repair" failed communicative attempts. The more effective the communicator, the more likely communicative behaviors will serve intended purposes.

Many individuals with autism and PDD show limited expression of communicative intentions that involve social goals, such as sharing experiences. This is especially true for young children and for persons with autism who have great limitations in communicative ability. Additionally, there may be particular difficulty in following and using common indicating strategies (e.g., pointing) to establish a joint focus of attention with communicative partners. Communicative acts, especially in early stages of communication and language development, are heavily skewed toward behavior regulation functions or need-based functions, such as requesting an object or protesting an event, as opposed to functions that are more social in nature, such as commenting, describing, or sharing emotions (Curcio, 1978; Mundy, Sigman, & Kasari, 1990; Wetherby & Prutting, 1984). This communicative pattern appears to be closely tied to social-cognitive differences; that is, motivations to communicate are focused on immediate needs and properties of the physical world rather than on social interactions and socioemotional concerns. This focus is analogous with Kanner's (1943) early claims of dissociations between person and object intelligence in autism.

Conventionality in communicative signaling refers to the degree to which the meaning of signals is shared or understood by a social community. At its most basic level, communicative behavior may be conceptualized along two dimensions: (a) as communicative means, or the behaviors used to communicate (e.g., gestures, words); and (b) as communicative function, or the goals that are actually accomplished through those means (e.g., requesting objects or actions, providing information). Typically developing children acquire communicative intentions on the basis of observed function—that is, children learn to communicate through the predictable

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reactions of others, first in response to their preintentional signals produced without specific purposes in mind, and eventually in response to intentional and purposeful prelinguistic and linguistic signals. Early in development, caregivers assign meaning to a range of vocal as well as nonvocal behaviors, and communicative means become increasingly conventionalized through reciprocal social exchanges (Ainsworth & Bell, 1974; Bates, 1979; Bruner, 1975; McLean, 1990).

It is now widely accepted that individuals with autism and PDD acquire unconventional behaviors to express communicative intentions in the absence of more conventional means (Prizant & Wetherby, 1987). Even speech production (e.g., delayed echolalia) may be unconventional in both form and function (Prizant & Rydell, 1993). In addition, nonverbal and paralinguistic behavior, including gesture, facial expression, intonation, and body orientation, typically is limited in augmenting communicative effectiveness (Fay & Schuler, 1980; Prizant, 1988; Ricks & Wing, 1975). The development of idiosyncratic communication patterns, which commonly incorporate unconventional and often undesirable communicative means, is frequently observed. These patterns may possibly emerge from the limited ability in imitating others and in social learning. Certain behaviors, previously dismissed as aberrant and nonfunctional, have been found through functional assessment to serve a variety of communicative purposes (Donnellan, Mirenda, Mesaros, & Fassbender, 1984). The use of unconventional and idiosyncratic communicative means places a greater burden on the communicative partner to be sensitive to body language and other subtle, difficult-to-read signals.

Contributions of a Developmental Framework

The burgeoning literature in social, communicative, and cognitive development provides a theoretical foundation both for understanding communication problems and for implementing effective and developmentally appropriate interventions. Three significant principles, drawn from the literature on communication development, are seen as crucial to understanding and enhancing the communication abilities of persons with autism (Prizant & Wetherby, 1989). First, communication development involves continuity from preverbal to verbal communication; that is, the development of preverbal communication is a necessary precursor to the development of the intentional use of language to communicate. Words should be mapped onto preverbal communication skills. For individuals with autism who do not speak, emphasis should be placed on developing preverbal social and communication skills. Second, a competent communicator is the product of a developmental interaction of cognitive, social-affective, and linguistic capacities. An individual's developmental profile across these domains should provide the basis for decision making for communication enhancement. Third, in a developmental framework, all behavior should be viewed in reference to the individual's relative level of functioning across developmental domains. Many of the challenging behaviors developed by individuals with autism and PDD can be understood as attempts to communicate if such behaviors are interpreted relative to developmental discrepancies and as coping strategies in the face of significant communicative limitations.

In attempting to understand the limitations in communicative intentions displayed by individuals with autism, it is helpful to consider the predictable sequences through which typically developing children acquire various communication skills (see Bates, O'Connell, & Shore, 1987; Lahey, 1988; and McLean, 1990, for reviews). As noted, research has documented that the development of preverbal communication is a necessary precursor to the development of the intentional use of language to communicate (Bates, 1979; Harding & Golinkoff, 1979). Children who are developing normally use prelinguistic gestures and vocalizations to communicate intentionally for a variety of purposes. Bruner (1981) suggested that three "innate communicative intentions" emerge during the first year of life:

1. Behavior regulation—communication used to regulate another's behavior for purposes of obtaining or restricting environmental goals.
2. Social interaction—communication used to direct another's attention to oneself for affiliative purposes.

3. Joint attention—communication used to direct another's attention for purposes of sharing the focus on an entity or event.

Prior to the emergence of words, normally developing children use intentional communicative signals for these three major functions (Wetherby, Cain, Yonclas, & Walker, 1988). Over the second year of life, these communicative intentions are expressed with more sophisticated and conventional signals, paving the way for the acquisition of symbolic communication.

Wetherby (1986) suggested that the easiest and first emerging communicative intention for persons with autism is behavior regulation, and the most difficult is joint attention, presumably because of the differing social underpinnings of these respective abilities. A lack of joint attention skills has become a hallmark of autism, as accumulated studies have documented this deficit in children with autism and PDD (Loveland & Landry, 1986; Mundy et al., 1990; Wetherby & Prutting, 1984). Because of the early emergence of joint attention in normal development, this limitation has important implications for early identification of autism and PDD (Baron-Cohen, Allen, & Gillberg, 1992; DiLavore, Lord, & Rutter, 1995; Mundy, Kasari, & Sigman, 1992; Prizant & Wetherby, 1987; Wetherby & Prizant, 1993). Furthermore, an individual's range of communicative intentions should be considered in deciding how to enhance communication development. Rather than setting goals based on form alone (e.g., gestures, words), enhancement should begin with an emphasis on function and form, such as use of gestures for behavior regulation, which is an easier-to-master and more specific functional goal for persons with autism and PDD. Once gains are made in behavior regulation, greater emphasis should be placed on communicating for more social purposes of social interaction and joint attention.

Pragmatic-social interactive theories since the late 1970s have focused on the role of social interaction in language development and have emphasized that successful communication involves reciprocity and mutual negotiation (Lahey, 1988; McLean, 1990). Joint action between the child and caregiver forms the social context in which children learn to talk (Bruner, 1978). From early in life, infants make deliberate attempts to share experiences with caregivers by sharing attention and affective states (Stern, 1985). Early displays of affect and directed eye gaze serve as signals to regulate interaction and help the caregiver read the infant's emotional state (Tronick, 1989). Children are viewed as active participants who learn to affect the behavior and ideas of others through active signaling, and who gradually acquire more sophisticated and conventional means to communicate, given the caregivers' contingent social responsiveness (Dunst et al., 1990). Thus, the combination of the readability of the child's signals and the caregiver's contingent social responsiveness influences the successful acquisition of communication and language.

Communication development reflects the mutual interaction of the child and significant others. The transactional model of development proposed by Sameroff (Sameroff, 1987; Sameroff & Chandler, 1975) underscores the developmental interplay between a child and his or her social environment. This model emphasizes child effects, implying that a child's behavior influences the caregiver's responsiveness, which, in turn, significantly influences the child's development. A compromised biology of early socialization will thus serve to transform the caregiving environment in a transactional fashion. The caregivers' ability to counteract these transactional effects and, ultimately, to foster successful communication will depend on the formal and informal supports available to them (Dunst et al., 1990).

The recent focus on encouraging individuals with autism to initiate more and to take a more active role in communicating should lead to the acquisition of greater knowledge of the reciprocal nature of communicative interactions, and, ultimately, conversation (Dawson & Galpert, 1986; Mirenda & Donnellan, 1986). Numerous intervention studies have demonstrated that providing opportunities to initiate communication and then responding contingently can result in meaningful gains in eye gaze and communicative behavior (Dawson & Adams, 1984; Klinger & Dawson, 1992; Mirenda & Donnellan, 1986; Peck, 1985). If responses to a child's communicative efforts are clear, consistent, and contingent on the meaning and intention expressed, the child is more likely to learn about the most effective

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The process of language acquisition may also be viewed from a broader cultural perspective. One of the unique qualities of humans is their ability to transmit and acquire knowledge from others, and to consider the perspective of others (Bruner, 1975; Vygotsky, 1934/1962). This capacity has been referred to as cultural learning. Tomasello, Kruger, and Ratner (1993) have recently described the ontogeny of cultural learning as progressing through three stages:

1. Imitative learning, in which learners imitate models provided.
2. Instructed learning, in which learners internalize the rules of the instructor and regulate their own attentional and learning strategies.
3. Collaborative learning, in which learners construct new meanings or ideas with other learners.

A child's emerging communicative competence reflects the child's developing capacity for cultural learning. Communication and language development in autism and PDD must be approached within a broad social-cognitive context that affords opportunities for cultural learning.

Understanding Challenging Behavior from a Communicative Perspective

Despite the fact that as many as 50% of individuals with autism display some functional speech and language skills (Prizant, 1988), problem behaviors such as aggression and self-injury may be used to procure attention, to escape from a task or situation, to protest against changes of schedule and routine, or to regulate social interactions in a predictable manner. For example, Carr and Durand (1985) reported that aggression, tantrums, and self-injury were more likely to occur in situations with a high level of task difficulty and a low level of adult attention. These challenging behaviors may range on a continuum, from automatic and nondeliberate to preintentional expression of internal states (such as frustration, boredom, or anxiety), and to intentional communication (e.g., protesting) used to deliberately affect others' behaviors (Prizant & Wetherby, 1987; Wetherby, 1986).

Given that unconventional forms of behavior often serve communicative purposes, efforts to manage behavior problems should acknowledge the functions that the problematic behavior might serve. Long-term solutions to many behavior problems ultimately involve the development of communicative skills, both to replace challenging behaviors used to communicate intent, and to prevent the further development of behavior problems. Positive, nonaversive, and respectful approaches to the management of challenging behaviors are becoming widely accepted as *best practices* for individuals with severe disabilities (see Carr et al., 1994; Horner et al., 1990; Reichle & Wacker, 1993). The expanded use and improved technology of functional assessment of challenging behavior have led to a variety of alternatives to using punishment as a way of precluding or managing difficult behavior (see Carr et al., 1994; Horner et al., 1990; Meyer & Evans, 1986; Reichle & Wacker, 1993). One effective intervention derived from a functional assessment has been to teach functional equivalents of, or replacements for, the challenging behaviors (Carr & Durand, 1986; Horner et al., 1990; Prizant & Rydell, 1993). For example, some challenging behaviors are determined through a functional assessment to serve a communicative function (i.e., either to request an object or attention, or to "escape" from a boring or frustrating activity). Functional communication training entails teaching the individual an alternative, appropriate communicative means to express the function(s) served by the challenging behaviors (Carr & Durand, 1985; Durand, 1990). A significant body of literature has demonstrated how functional communication training can lead to (a) a reduction in problem behavior, (b) generalization across people and social contexts, and (c) maintenance of acquired skills over time (see Durand, Berotti, & Weiner, 1993, for a review). It has been demonstrated that the challenging behavior will be reduced only if the alternative communicative means serves the same function as the challenging behavior (Carr & Durand, 1985).

Challenging behaviors do not always serve communicative ends; they may reflect internal states or environmental variables rather than

visual-spatial arrays from samples (e.g., elaborate arrangements of blocks); and solution of jigsaw puzzles, form boards, block design tasks, and so forth.

Information processing research, capitalizing on a now classic series of experiments conducted by Hermelin and O'Connor (1970) and Frith (1971), has further clarified the cognitive traits of individuals with autism and PDD. These individuals perform well on tasks that rely on spatial location and simultaneous information processing, but they have difficulty with the coding and categorization of sequential information. Furthermore, autistic children performed equally well when recalling nonsense as opposed to meaningful series of information, regardless of whether visual or auditory stimulus input was presented (Hermelin, 1976). Control groups did better in the recall of meaningful series. In other words, the autistic children employed a rote memorization strategy that was not aided by meaningful stimuli. This outcome has been interpreted by Hermelin as reflecting an impairment with the coding and categorization of information.

Based on extensive nonverbal investigations of the conceptual and representational abilities of a mute adolescent with autism, and on larger-scale follow-up studies, Schuler (Schuler, 1979, 1995; Schuler & Bormann, 1983) has suggested that individuals with autism seem to perform considerably better with nontransient rather than transient stimulus input, and when only judgment of object and material properties and spatial orientation is required, rather than judgment about the impact of one's own and others' action. An understanding of social causality requires processing of temporally organized, sequential cues. An understanding of object properties and spatial relations is acquired more readily by individuals with autism because of the nontransient nature of the discriminations involved. Reports of this pattern of ability and disability are commensurate with the discrepancies reported by Kanner (1943). That is, strengths tend to revolve around object manipulation and object knowledge, whereas apparent weaknesses are related to the development of social cognitive constructs (for a discussion of the differences between thinking about people and thinking about objects, see Hoffman, 1981). It may be speculated that, at least in part, specific weaknesses are noted in social communicative domains because signals that regulate social interactions are largely transient, as are the interactions themselves.

Metarepresentation as an Explanatory Theory

Frith (1989) interprets the extremely literal ways in which people with autism process information as indicative of a reduced awareness of their own thoughts in relation to the thoughts of others. In experiments designed to measure the construct of *theory of mind*, children with autism have been found to have difficulty understanding the beliefs and desires of others (Baron-Cohen et al., 1985; Baron-Cohen, Leslie, & Firth, 1986). In an experiment utilizing various dolls and props, Wimmer and Perner (1983) presented the following scenario to typically developing 3- and 4-year-olds:

> A girl named Sally enters the stage. She leaves after putting a marble into her basket. Next a different girl named Anne appears, who takes the marble out of Sally's basket to hide it in her own box.

Subsequently, the 3- and 4-year-olds were asked the following questions: "Where is the marble really?" and "Where was the marble in the beginning?" Although these questions did not present any trouble to either age group, the subsequent question proved to be hard for the 3-year-olds to answer: "Where will Sally look for her marble?" The younger children found it difficult to apprehend that Sally's picture of the world doesn't match reality. A better understanding of Sally's beliefs and intentions was shown by 4- and 5-year-olds.

When this same scenario was presented to a group of children with autism, who were compared to developmentally matched normal children and to children with Down syndrome, 80% of the children with autism predicated that Sally would look for the marble in its actual location rather than where she would be expected to look (Baron-Cohen et al., 1985). Similarly, when asked to sequence pictures that dealt with people as opposed to objects, children with autism did poorly when it was necessary to comprehend the beliefs of others

the expression of communicative intentions. However, the boundary between intentional and preintentional behavior is not precise. Preintentional behavior may eventually be used intentionally when the effects or outcome of these behaviors become anticipated as a result of previous experience with others' reactions. Intentionality is thus a matter of degree rather than an all-or-nothing phenomenon (Prizant & Wetherby, 1985; Wetherby & Prizant, 1989). For instance, rather elaborate speech may reflect only limited communicative intent, such as when the same phrase is literally repeated over and over without any adjustment to allow for greater communicative efficacy. Typically, the greater the intent, the greater the persistence, repair, and diversification of the behavior if initial attempts are unsuccessful or if anticipated outcomes are violated (Wetherby & Prizant, 1989).

The nature and extent of the challenging behaviors of individuals with autism and PDD are certainly primary determinants of the extent of independence that can be achieved in domestic, educational, and, eventually, vocational settings. Assessment and communication enhancement efforts should thus examine an individual's communicative system as a whole, including apparently unconventional and/or challenging behaviors, which may serve communicative and/or cognitive functions. Because these matters are most critical for individuals with severe communicative and cognitive disabilities, they are discussed in considerable detail in Chapter 24 (on prelanguage approaches). Nevertheless, for verbal as well as nonverbal individuals, the basic tenet accepted is that behavior problems should always be examined in the context of an individual's repertoire of communicative means and functions, and how these are used in a natural context. To acquire a more fully integrated picture of communicative abilities, cognitive differences also must be considered.

DEVELOPMENTAL DISCONTINUITY AND COGNITIVE STYLE

A broad understanding of communication from a functional perspective needs to be combined with knowledge of the developmental discrepancies and discontinuities associated with autism and PDD. Behavioral and communicative differences can only be understood in reference to social-cognitive differences, because of their common roots. Evidence for cognitive differences has been gathered from a number of sources, including (a) intelligence testing (see DeMyer, 1975; Prior, 1979) and claims of generalized cognitive deficits (Rimland, 1964; Rutter, 1968, 1983); (b) applied learning research on persistent generalization problems (for a discussion, see Koegel, Rincover, & Egel, 1982) and so-called stimulus-overselectivity (for a review, see Lovaas, Koegel, & Schreibman, 1979); (c) research on information processing and theory of mind (Baron-Cohen, Leslie, & Frith, 1985); and (d) developmental discontinuity, as evidenced by specific patterns of abilities and disabilities (see Schuler, 1995, for a review).

Developmental discontinuity has intrigued caregivers as well as professionals ever since the publication of Kanner's first case studies (1943), in which he referred to his subjects as cognitively "well endowed," based on observations of isolated specific ability. Approximately two-thirds of all individuals with autism have subsequently been described as intellectually impaired, based on their performance on standard IQ tests (DeMyer, 1975). Although some of the commonly observed areas of relative ability have been discarded as "splinter skills," the true nature of the cognitive differences and cognitive impairments continues to challenge researchers and practitioners. The often striking contradictions between apparent intellectual promise (based on observation of specific skills) and significant limitations in communicative and adaptive skills are a source of great interest and promise—and frustration—for those closely involved with people with autism and PDD.

The patterns of relative strengths and weaknesses identified in the literature provide some insight into this matter. Commonly cited abilities of autistic persons include an excellent rote memory for both visual and auditory information, and proficiency in tasks demanding visual-spatial judgment and pattern recognition (Grandin, 1995; Prior, 1979; Prizant, 1983b). Specific skills related to these abilities include both recognition and reproduction of melodic patterns; construction of

(Baron-Cohen et al., 1986). These selected impairments in understanding the beliefs of others have been reported by other researchers and have been extended to include the desires of others (e.g., Harris, 1993).

Confirming the validity of Kanner's theory on the early differentiation between objects and people, Hobson (1990) has suggested that the impaired social and communicative abilities in autism may result from a deficit in *affective* relations with others, compared to a relative strength in relations with the physical world. Based on the theory of mind research findings, Baron-Cohen (1988) has proposed that the primary deficit in autism is cognitive and that it involves a selective impairment in the capacity for *metarepresentation* or beliefs about other people's mental states. Baron-Cohen attributed the deficits in joint attention and other pragmatic skills, as well as the deficits in symbolic play and theory of mind, to an impaired metarepresentational capacity, and urged an integration of the cognitive and affective theories. In consideration of the relatively early emergence of joint attention, it is plausible that the impairment in joint attention in early development underlies the impairment in theory of mind in later development. Sigman and Kasari (1995) suggest that the joint attention deficit in autism reflects the demands of integrating attention and cognition with affect.

Differences in Style of Cognitive Processing

Frequently cited characteristics of language and communicative behavior in autism can be understood in reference to analogous differences in the cognitive and language acquisition styles of normally developing children. A differentiation between gestalt versus analytic forms has been made in reference to differences in styles of language acquisition (i.e., gestalt vs. analytic styles; Peters, 1983). Gestalt language forms are multiword utterances that are memorized and produced as single units or chunks, with little analysis of their internal linguistic structure and with little or no comprehension of the utterances themselves. Analytic forms, on the other hand, are generated on the basis of the application of (a) linguistic rules that presume greater comprehension of constituent structure, and (b) the specific meanings encoded by those utterances and their component parts. These two different forms of language, gestalt and analytic, have been noted to be used by typically developing children, and appear highly relevant to the understanding of language acquisition strategies in populations with various disabilities (Prizant, 1983b; Schuler & Prizant, 1985; Wills, 1979).

Prizant (1983b) proposed that children with autism use a gestalt strategy in early language learning by imitating unanalyzed chunks or multiword units of speech and subsequently breaking down these units into meaningful segments. Most verbal individuals with autism seem to demonstrate a gestalt style of language acquisition in that their early utterances are typically rigidly echolalic (Ricks & Wing, 1975), and their early communicative functions tend to be expressed through immediate and delayed echolalia (Prizant, 1987; Schuler & Prizant, 1985). This cognitive style is a relatively inflexible mode of information processing that results in the memorization of unanalyzed chunks of information, including speech stimulus as well as visual stimulus input. In contrast, a more analytic style allows for decoding the specific meanings of the component parts of a sequence in relation to each other. This process is based on extraction of the meaning or "gist" of experiences by interrelating the relevant pieces of information and references to previous experiences, and not by simply storing information to be reproduced later in an identical fashion (Fay & Schuler, 1980; Prizant, 1983a). Prizant (1983b) suggested that, for many verbal children with autism, language acquisition progresses from (a) the predominant use of echolalia, with little evidence of comprehension or communicative intent, to (b) the use of echolalia for a variety of communicative functions, and later to (c) a decrease in echolalia co-occurring with an increase in creative, spontaneously generated utterances. Pronoun reversals, stereotypic utterances, and insistence on certain verbal routines—all common characteristics of language use of verbal individuals—may also reflect a gestalt strategy in acquisition and use. The prevalence of gestalt forms can thus be concep-

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tualized as variation at the extreme end of the normal continuum, which apparently corresponds with differences in cognitive style.

Weaknesses in processing transient signals may also contribute to gestalt patterns. Processing of transient signals is critical to comprehension of the constituent structure of utterances and to construction of a generative grammatical system. Construction of a linguistic rule system requires rapid processing of both auditory and visual transient information (speech as well as nonverbal cues) and presumes an ability to focus on consistencies and variations within speech and nonverbal behavior as they occur relative to objects and social or nonsocial environmental events. A gestalt mode of processing is ill-suited to the apprehension of transient signals and is clearly counterproductive when it comes to unraveling the temporally coded segmental structure of spoken language as well as the temporal structure of social interaction. Common reports on precocious written-word skills, or even on so-called hyperlexia (Aram & Healy, 1988), are of relevance in this context. A major difference between written and spoken language lies within the coding mechanisms involved—that is, in the utilization of nontransient versus transient signals. Because the processing of written language is not as dependent on sequential analyses, superior written-word skills in individuals with autism are readily explained.

The preference for nontransient signals and the associated information processing style may impede the acquisition of rule-governed systems of linguistic and social knowledge. On the other hand, it could be argued that the prevalent cognitive style in autism results from impaired social interaction, if early social experience is viewed as a primary determinant of more flexible social and linguistic rule systems and the modes of processing associated therewith. In other words, social interaction limitations can partially be explained on the basis of cognitive style differences, or cognitive style differences can be explained on the basis of early and pervasive limitations in joint attention and social interaction. Whatever the case, approaches to communication enhancement that address the cognitive discrepancies (taking into account both strengths and weaknesses) and the gestalt style of language acquisition and use would seem to be "best-fit" interventions, considering the distinctly different learning style of persons with autism and PDD (Grandin, 1995; Prizant & Wetherby, 1989; Schuler, 1995). Commonly cited challenges—lack of flexibility in communication and language; development of unconventional verbal behavior, including echolalia; insistence on preservation of sameness; and overreliance on social routines and rituals—need to be approached and understood as resulting from these cognitive differences.

IMPLICATIONS FOR COMMUNICATION ASSESSMENT AND ENHANCEMENT

Advances in the conceptualization of autism and PDD as developmental disabilities involving impairments of social interaction, communication, and symbolic abilities have had a great influence on approaches to language intervention (Prizant & Wetherby, 1988). Contemporary language intervention approaches differ dramatically from the traditional operant behavioral approaches to language and communication "training" that dominated the 1970s and early 1980s. One of the most critical differences is the emphasis on successful communicative interactions in natural contexts, which affects all aspects of programming, from targeting goals to designing the contexts of intervention. The developmental idiosyncrasies associated with autism tend to complicate intervention efforts; the communicative and social limitations are often masked by much higher skills, leading to frustration and unrealistic expectations. Consequently, individuals with autism have often been considered noncompliant, which has led to a focus on compliance training. As a result, much potential ability may be used in a maladaptive way—for example, in learning to escape from extremely didactic and demanding teaching sessions that are experienced as aversive (because they may not make sense to the individual involved and do not lead to an increased sense of control).

The cognitive and communicative discrepancies discussed above raise a host of other

issues. Communication problems experienced by people with autism and PDD are not simply a matter of isolated deficits; they reflect underlying social-cognitive limitations that impact on social interaction and communication. Therefore, a deficiency remediation model does not suffice. Rather, communication assessment and enhancement practices should be guided by efforts to understand, modify, and expand current social/communicative, linguistic, and cognitive systems, acknowledging the functions served by an individual's current behavioral repertoire and coping strategies. The advocated approach is *transactional* in nature: it addresses the individual with autism or PDD, the social environment, and the interaction between the individual and the environment. A transactional approach is a *constructivist model* that addresses *interactive* and *functional* dimensions of communication.

The term *constructivist* is used because learning is viewed as an active process by which individuals "construct" or build knowledge and meanings based on interactions with people and experiences in their environment (Brown, Bransford, Ferrara, & Campione, 1983; De Ruiter & Wansart, 1983; Piaget, 1971; Rogoff, 1990; Wertsch, 1985). If newly acquired skills are to be integrated within one's current behavioral repertoire and cognitive understanding, teaching should extend current knowledge and incorporate self-generated behaviors. Because communication is rooted within such cognitive understanding, the primary focus is on helping individuals communicate about things they know or emotions they feel. Similarly, language should be taught as a tool to help organize experiences and to plan and regulate behavior, allowing for the integration of experiences across different environments and times of occurrence. Language experience is thus used to mediate thinking and problem solving (Brown et al., 1983; Rogoff, 1990; Vygotsky, 1934/1962) and, ultimately, to increase the capacity for cultural learning, moving the individual from imitative and instructed to more collaborative forms of learning that allow for the broadest developmental impact (Tomasello et al., 1993).

The advocated intervention approach is *interactive* because social interaction is viewed as the medium of language learning; the reactions of others refine and reinforce communicative behaviors in terms of function and structure. Through social interaction, individuals experience and come to understand the impact of their communicative attempts on their environment. (For a more detailed discussion of interactive approaches to language learning, see Snow, Midkiff-Borunda, Small, & Proctor, 1984.) This interactive dimension underscores the need for consistent and clear responses to the communicative endeavors of individuals with autism and 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" (Nelson, 1981). The predictability inherent in structured intervention sessions may help provide the roots of communication as the individuals involved learn to anticipate the behavior of others and to observe the outcome of their own communicative bids. Further expansion and refinement of scripts are acquired in peer play.

Because of the transactional nature of communication, communication enhancement should focus not only on the behavior of the individual with autism, but also on the communicative partner. Knowledge of language structure is facilitated through semantic contingency between the initiations of the autistic individuals involved and the responses of others. Communicative partners must be responsive to the intentions as well as to the semantic content of an autistic individual's utterances. Contingent responses of others not only serve to acknowledge initiations but also may help to restructure inflexible and stereotyped utterances. Goals for communicative partners should include learning to: create opportunities for communication, wait for the initiation of communication, read the communicative attempts of the individual with autism or PDD, and then respond in a supportive manner. Significant others need to understand an individual's language abilities across contexts, in order to adjust their own language and to foster language and communication goals that are developmentally appropriate.

The advocated approach is *functional* because intervention should be built around actual communicative needs that pertain to everyday living routines and environments.

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There is then a clear and natural incentive to communicate. Stated differently, the perspective of the learner should be adopted. Instruction should be learner-centered more than "teacher"-imposed (and thus unrelated to daily communicative needs and motivations to communicate). Given that many individuals are limited in their grasp of communication as a purposeful and collaborative social transaction, a primary focus needs to be placed on the establishment of an interest in communication based on experiencing socially and emotionally satisfying interactions. That is, communicative exchanges must make sense in events that make sense, and the exchanges must foster the development of secure and trusting relationships before too much emphasis is placed on producing the correct word or sentence, or articulating clearly, or other requirements.

Assessment Principles

To provide for the type of communication enhancement approach advocated here, (a) assessment should focus on communicative needs in a variety of natural environments and (b) current communication strategies should be examined. The primary function of assessment is to provide information that can be directly translated into goals for communication enhancement and that can be used in the evaluation of intervention efforts. In fact, assessment and intervention are dynamically interwoven: assessment guides intervention, and intervention continues to refine and expand assessment questions. Assessment is thus an ongoing process rather than a brief, episodic exercise. Therefore, assessment should not focus on tasks that may be completely unrelated to actual communicative behavior, or on molecular fragments of behavior that have lost their meaning and function because they are devoid of relevant context. Assessment that attempts to diagnose only deficiency will likely not contribute to the enhancement of communication abilities.

Caution should be applied in using more traditional norm-referenced and/or standardized assessment tools, which are often based on assumptions that do not hold true for individuals with autism or PDD. For normally developing children, advances in one domain of development are typically paralleled by similar gains in related areas. This synchrony is often absent in persons with autism or PDD. Normal or near-normal development in areas such as motor development and speech production may occur alongside profound delays in the development of relatively simple social/communicative skills such as imitation, joint attention, communicative gesturing, and turn-taking. In fact, relatively advanced skills in one area may pose serious problems for assessment, because less apparent deficiencies are then easily overlooked. Given these discontinuities, assumptions about synchronous development across domains may be violated.

A second problem lies in the behavioral challenges that may seriously interfere with the completion of any assessment in a standardized manner. The disruption of familiar routines, which is inherent to testing situations, and the novel demands posed may cause confusion and distress, leading to so-called noncompliant behavior. A third problem lies in the lack of comprehension of not only verbal, but also nonverbal communication, including pointing and other gesturing. Very few formal tests are truly nonverbal; they often presume social imitative abilities that may be limited in some individuals with autism. A fourth related problem has to do with limited comprehension of social conventions. Whereas normally developing children may perform to please the examiner, even if the testing situation does not make any sense from a child's perspective, individuals with autism and PDD may not do so (for a discussion, see Donaldson, 1978). Generalization problems are another obstacle; although certain skills may be observed in more natural contexts, they may not be observed during formal assessments. Nevertheless, for purposes other than intervention planning (diagnostic or predictive purposes, for example), standardized tests may be of some value. For those purposes, tests should be carefully selected and adapted as needed.

The assessment process, in this view, is guided by some central core questions that are continuously redefined on the basis of overall developmental level, environmental needs, and preliminary assessment outcome. These core assessment questions pertain to

the communicative/social, cognitive, and linguistic domains and the interrelations among those domains, so that areas of greatest needs and greatest strengths are identified. Table 23.1 summarizes these basic domains in their most general form and provides a framework for assessment concerns. (Chapters 24 and 25 demonstrate how these domains become more detailed regarding overall functioning levels, preliminary assessment outcome, and individual differences.) Because assessment is viewed as a tool, rather than as an end in itself, many different assessment approaches may be used: observational or experimental, formal or informal, structured or less structured. A useful initial method for gathering information about an individual's communication and language abilities is to interview significant others who are familiar with the subtle nuances of communicative behaviors. The natural variation in behavior across contexts and interactants necessitates the use of multiple assessment tools and strategies in different contexts. (For a further discussion of these issues, see Lund & Duchan, 1993.) Furthermore, performance variables related to context and interactional style deserve to be investigated, because communication is a dyadic phenomenon closely tied to, and determined by, social context. Assessment, therefore, should not be limited to the evaluation of student variables; it should be extended to contextual and interactional variables.

TABLE 23.1 Core Assessment Domains

Language and Communication Domains
Expressive language and communication:
use of idiosyncratic/conventional gestures
quality of vocal means
complexity of verbal means (words, sentences, conversation)
modality strengths and preferences (verbal, gestural, graphic)
Receptive language and communication:
use of nonlinguistic response strategies
understanding of conventional meanings
engagement in discourse
Sociocommunicative and Socioemotional Domains
Range of communicative functions expressed
Reciprocity of interaction evident in rate of communicating and use of repair strategies
Use of social-affective signals for social referencing and for regulating interaction
Comprehension of and expression of emotion in language and play
Use of self- and mutual-regulatory strategies to modulate arousal and emotional state
Language-Related Cognitive Domain
Evidence of symbolic representation in symbolic or constructive play
Imitation strategies
Anticipation of routines/ event knowledge
Attention in social and nonsocial contexts

Developmental and Functional Considerations for Communication Enhancement

In recent years, clinicians and educators have debated the question of how goals and objectives for persons with autism and related disabilities should be derived. At one extreme are those who focus primarily on the functional needs of a person relative to his or her chronological age (Brown et al., 1979), placing minimal emphasis on potential contributions from literature on normal language and communication development. At the other extreme are developmentally oriented clinicians, especially those with expertise in language and communication development, who have tended to focus on approaches that attempt to move children along a developmental track based on research on language and communication development (Lahey, 1988).

Information on language and communication development offers an organizational framework for assessment and intervention. Too rigid an interpretation of a developmental model has resulted in "readiness models," which require a student to reach a certain level of ability before working on a subsequent skill. A distinction must be made between working within a developmental model, which is the advocated approach, and teaching according to a developmental checklist. Rather than merely offering a guideline for sequencing communication goals, developmental information can provide a frame of reference for understanding an individual's behavioral competencies and for setting appropriate goals.

Prizant and Wetherby (1989) have argued that so-called functional approaches (which tend to be behaviorally oriented) and developmental approaches need not be viewed as mutually exclusive. However, many educators and clinicians tend to lean heavily toward either developmental approaches or functional/behavioral approaches, to the virtual exclusion of integrating the best practices from both approaches. Nevertheless, the two perspectives can be integrated. Intervention goals and contexts for communication enhancement can and should be selected on the basis of functional as well as developmental criteria. Developmental considerations should contribute to, but not mandate, the selection of goals, and they should serve to guide the choice of task adaptation and the selection of appropriate contextual supports (e.g., visual aids such as picture schedules, choice boards, and so on). Goals should be selected on the basis of functional considerations, particularly when dealing with teenagers and adults.

For communication enhancement activities to be most relevant for children with autism and their families, approaches must be directed toward increasing functional skills to enhance independence, and reducing stress on the family by providing appropriate tangible and psychosocial supports. Functional criteria should be based on the assessment information obtained from caregivers' and professionals' knowledge of an individual's communicative needs. On the other hand, developmental considerations will have great bearing on the specific communicative means targeted. Without careful attention to developmental issues, communication enhancement efforts can target competencies that are considerably above or below an individual's capabilities. However, the uneven profile of abilities and disabilities in cognitive and communicative functioning, which, in part, is definitive of autism and PDD, should caution against the adoption of too narrow a developmental focus. The validity of intervention goals will be questioned if they fail to account for functional as well as developmental issues.

Contemporary approaches to treatment are guided by a growing appreciation of both social and linguistic aspects of communicative competence. As noted, the communicative characteristics and related social-cognitive style of individuals with autism and PDD suggest that the function and meaning underlying communicative acts should always supersede their form, when considering the nature of "true" communicative growth. A rigid preoccupation with speech development and correct language structure or form is counterproductive if individuals are striving to experience the power of communication in controlling their living environments and developing meaningful relationships with others. Therefore, communication enhancement efforts, emerging from behavioral (Charlop & Haymes, 1994; Koegel & Johnson, 1989; Koegel, O'Dell, & Koegel, 1987) as well as developmental traditions (Klinger & Dawson, 1992; Prizant, 1988; Wetherby & Prizant, 1992), have increasingly emphasized and incorporated more pragmatic dimensions of communication, including social reciprocity, and a greater variety of communicative functions and social contexts. This functional-pragmatic orientation was highly influential in moving communication enhancement efforts to consider the communicative meaning of challenging behavior, which has become a joint focus for combining interventions that address both behavioral issues and communicative growth (Prizant & Wetherby, 1987). To enhance effective communication, alternative (nonspeech) means of communication may need to be explored, such as gestures, signs, and pictorial or written modes of exchange. In addition, even the subtlest and often unconventional or idiosyncratic modes of communication need to be recognized, for they may provide the foundation for communication enhancement based on understanding and respecting a person's efforts to communicate. By providing consistent responses to communicative initiations and replacing undesirable means of communication with more conventional or socially acceptable ones, communicative success is more likely to occur.

Communicative Events and Functions

Because individuals with autism and PDD, at all ability levels, are so challenged in their understanding of communicative events in social context, communication enhancement efforts must be concerned with all dimensions

of communication—that is, with enhancing communicative means and providing a better understanding of the function of communicative behavior and of the dyadic structure of communicative events. Communicative events occur when two or more participants engage in social interactions cooperatively, to accomplish particular goals (e.g., sharing information, solving a problem, playing a game, and so on). The structure of such events involves reciprocal exchanges. Each participant must have some understanding that he or she has a role and a responsibility to fulfill in the exchange toward a shared goal. Approaches such as task analysis, which breaks down teaching procedures and responses into minute steps, may be counterproductive when applied to communication development, because they do not help children to make sense out of communicative transactions (Donaldson, 1978; Duchan, 1986).

Because individuals with autism evidence cognitive discontinuities and a limited grasp of communicative events, functionality of communication should always be the primary consideration. (For a more detailed discussion of functionality issues, see Goetz, Schuler, & Sailor, 1979; Prizant & Wetherby, 1989.) Verbal and nonverbal communicative behavior should always be surrounded by a natural incentive that serves to highlight the communicative function served, be it a request, a directive, a protest, or another communicative function. Providing language intervention is thus not so much a matter of specifying desirable response topographies as of providing motivating contexts, including opportunities and needs to communicate (McLean & Snyder-McLean, 1978). This implies that language intervention should largely take place in the natural environment, capitalizing on the notion of incidental teaching and joint activity routines (see Cavallaro, 1983; Hart, 1985; Koegel, O'Dell, & Koegel, 1987; Snyder-McLean, McLean, Etter-Schroeder, & Rogers, 1984).

Cued Response Training versus Communication Enhancement

Traditional behavioral treatment programs that predominated in the 1970s and 1980s utilized imitation, prompting, and reinforcement techniques within a discrete-trial teaching format that targeted speech or language as an operant behavior (Charlop & Haymes, 1994). It is important to distinguish between (a) the learning of cue-dependent response topographies, as is characteristic of traditional behavioral programs (e.g., Lovaas, 1981), and (b) the acquisition of true communicative, linguistic, and social knowledge. Because many autistic individuals do quite well with the situation-specific recall of unanalyzed memorized phrases, they may easily learn specific responses to visual or auditory cues that may be mistaken for truly communicative behaviors. Unfortunately, many traditional language-training programs view such responses as indicative of linguistic or communicative progress, applying success criteria that fail to reflect spontaneous and communicative use of creative forms. Subsequent to situation-specific training, which results in the reproduction of specified response topographies, "generalization" training is often identified as the final step of the program. Our position is that truly functional communicative and linguistic behavior *is defined* by flexibility in use and generalization across contexts. Consequently, communicative advances cannot be claimed solely on the basis of situation-specific responses. Furthermore, we believe that elaborate training of situation-specific responses can be misleading both to parents and to professionals who may not understand the limited impact that such response training may have on the life of a person with autism or PDD. For persons unfamiliar with autism and the associated discrepancies in learning and development, exposure to an elaborate verbal repertoire may lead to attempts at interaction that are far too complex to understand. The results will be frustration and interactional breakdown for the parties involved.

The major dimensions that distinguish a developmental/social-pragmatic approach (from which we draw heavily) from a traditional operant behavioral approach, are delineated in Table 23.2. More contemporary behavioral approaches, in contrast, have moved away from the discrete-trial format which focuses on compliance training and readiness skills, and toward a more naturalistic approach to language and communication enhancement—an

TABLE 23.2 Dimensi
Programs for Individu

Dimension
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Response to child's beha
Naturalness of context
Relevance of information development
Social context of interven
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Type of reinforcement
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TABLE 23.2 Dimensions to Consider in Planning and Implementing Communication and Language Programs for Individuals with Autism

Dimension	Developmental/Social-Pragmatic Approach	Traditional Behavioral Approach
Theoretical underpinnings	Developmental and social-pragmatic theory; transactional teaching model	Learning theory; applied behavioral analysis; unidirectional teaching model
Degree of prescription vs. flexibility in teaching	Strategies applied systematically but flexibly; capitalize on natural or simulated opportunities	Highly prescribed—content and procedures determined on an a priori basis as part of program with minimal variation
Adult- vs. child-centered	Content influenced by child's level of development; when possible, follow child's lead	Adult initiates "topic," determines focus of attention; adult control reduced in time
Child role—initiate vs. respond	Priority placed on child initiation, in appropriate balance to responding	Initially, train responding; later, train "spontaneity"
Response to child's behavior	Consequences depend on child's communicative intent	Consequences depend on predetermined procedures
Naturalness of context	Learning contexts reflect natural interactions and events to the extent possible	Initially contrived, discrete trial training; eventual movement to more natural situations
Relevance of information on child development	Developmental information and individual child's learning strategies used to select goals and teaching procedures	Not of primary relevance; goals and procedures based on predetermined program or child's perceived needs
Social context of intervention	Groups of different social complexity—one-to-one, small group, large group—depending on child's ability	Primarily one-to-one, especially in early stages; movement to more complex social groupings
Carryover and generalization to other environments	Skills taught across environments and persons, from early in program	Generalization programmed for after child reaches criterion in initial training context
Intensity—extent and frequency of direct teaching	Varies greatly according to child; staff ratio and skill of staff in programming learning opportunities in natural environments	Intensity is determined by nature of specific program; focus on one-to-one direct teaching
Utilization of child's strengths	Activities based on child's preferences and strengths; follow child's interests	Reinforcers selected on basis of child's preferences; activities may not be
Type of reinforcement	Focus on natural reinforcers, including responding to child's intent; social reinforcement	Initial use of artificial reinforcers, then artificial and pairing of social, and, finally, movement to social
Treatment of challenging behavior	Understand behavior from developmental perspective and child's communicative intent; if intent can be determined, modify environment/task and/or replace with socially acceptable form	Understand behavior by identifying maintaining variables; ignore (extinguish) or punish challenging behavior. If functional analysis is performed, replace with socially acceptable form

Continued

TABLE 23.2 (*Continued*)

Dimension	Developmental/Social-Pragmatic Approach	Traditional Behavioral Approach
Type and intensity of data collection—documentation of progress	Varies from informal impressions to on-line time sampling. May use language–communication sampling and analysis to determine changes in level of functioning or in developmental patterns	Typically, intensive, ongoing, online data collection, or time sampling; focus is on frequency counts of discrete behaviors; Looking for increases or decreases in target behaviors
Consideration of individual differences in learning	Attempts made to determine differences in learning style, with program modifications made according to differences	Individual preferences used in selecting reinforcers; however, program and child needs determine program content and procedures
Role of typical or developmentally advanced peers	Peers seen as positive developmental influence; more focus on natural or semistructured play interactions	Initially, peers play minimal (if any) role; eventually, peers may be trained to play role in structured teaching
Parent involvement	Parents taught to understand child's developmental patterns and to use natural routines and developmental strategies	Parents taught principles of behavior modification and encouraged to carry out prescribed teaching program

From "Dimensions to Consider in Planning and Implementing Communication and Language Programs for Individuals with Autism and PDD," by B.M. Prizant, October 1994, Seminar presented for State of Connecticut Special Education Directors, Fairfield, CT.

approach that draws from, and is closely aligned with, the description of a developmental social-pragmatic approach (for example, see Koegel, Camarata, & Koegel, 1994; Koegel & Johnson, 1989).

Nonspeech Communication Modes (Augmentative and Alternative Communication)

Traditional behavioral interventions have focused on increasing speech output (see Charlop & Haymes, 1994; Schuler, Gonsier-Gerdin, & Wolfberg, 1990, for reviews). Researchers are increasingly recognizing, however, that training speech production does not necessarily enhance communicative competence, and that communication development can be fostered by, and proceed through, nonspeech means. The increased use of communication augmentation speaks to this realization, acknowledging the value of nonspeech means of communication. After all, meaningful language and communication growth (i.e., initiated and spontaneous use of language for a variety of communicative purposes) cannot be determined on the basis of pre- and posttreatment comparison data collected in contrived and controlled training sessions. Too narrow a focus on training discrete instances of observable behavior may lead one to the misleading assumption that discrimination training or compliance training is equal to language learning and communication development. In such an approach, responses may be void of communicative intent, social motivation, and understanding.

Selection of a communication and/or language system should be based on an individual's social, communicative, cognitive, and motoric abilities. Because considerations of function tend to override structural concerns, special attention should be given to the use of nonspeech communication systems. Lack of communicative understanding is reflected in limitations of verbal as well as nonverbal behavior. Therefore, introduction of augmentative or alternative communication systems is by no means a panacea. Progress may be slow, especially for individuals with more severe

social-cognitive limitations. Nevertheless, for most nonspeaking persons, a nonspeech means to communicate may be a tremendous asset: it can demonstrate the power of communication without requiring neuromuscular coordination and motor planning, which are involved in speech production. Although nonspeech communication systems may be extremely helpful in teaching communication—and have actually been documented to do so (Kiernan, 1983; Layton, 1987; Reichle, York, & Sigafoos, 1991)—no specific recommendations can be made regarding implementing specific systems for persons with autism or PDD, as a group. Matches between individuals and systems need to be made carefully, and selected systems may need to be continuously adapted to the needs of individuals.

Nevertheless, some general principles apply when selecting suitable systems for individuals with autism and PDD. Given the fact that so many individuals with autism are limited in their use of gestures, facial expression, body orientation, and other nonverbal means of communication, enhancing the use of nonverbal communicative means as an augmentative system, prior to or along with introduction of an alternative formal nonspeech communication system, may be appropriate. Furthermore, given that many individuals seem better able to process visuospatially coded information, written words, pictorial systems, communication boards, and other systems that incorporate nontransient signals (e.g., visual displays) may be preferable (Prizant & Wetherby, 1989; Quill, 1995).

Recently, the issue of facilitated communication (FC) has been at the center of much attention and heated debate. We recommend that the notion of communicative intent be considered in understanding and interpreting communicative behavior of individuals with autism, whether the communication entails natural gestures or other nonverbal behavior, speech, written or typed communication, or some other augmentative communication system (Prizant, Wetherby, & Rydell, 1994). An individual's communicative competence should be documented multidimensionally, reflecting the range of intentions expressed, the conventionality of means used to express intent, and the degree of intentionality evidenced. With evidence of independent success, an individual's use of FC should then be considered in relation to the individual's full repertoire of communicative behavior. Although some reported cases of success with FC indicate unexpected literacy skills, many are within the realm of what would be expected, given a person's symbolic level with other means of communicating. Significant discrepancies between level of communication expressed with FC and with other means of communication need to be examined carefully. The issue of facilitator influence warrants serious scrutiny, and, of course, is at the heart of claims that FC is a fraudulent educational practice. A recent report provides a comprehensive consideration of research and practice in FC (Calculator, Fabry, Glennon, Prizant, & Schubert, 1995).

Competence Model

When communication enhancement is approached in a more interactive, supportive, and competency-oriented manner, interventionists are more likely to respond and assign meaning to communicative initiations from others. The advocated approach starts with the competencies of the individual, identifies current learning strengths and communicative strategies, and builds on the strategies that may be effective in serving important communicative functions. Additionally, motivating learning contexts must be identified and expanded to encourage independence by providing opportunities for communication, and by gradually eliminating supports provided to increase communicative effectiveness. Recent research findings suggest that, for children, naturalistic play contexts that facilitate social and communicative success may be a more effective means of enhancing communication and language development than direct instruction in designated language forms (Wolfberg & Schuler, 1993). Whether language gains can indeed be promoted by gains in social interaction and symbolic play across a wide range of individuals deserves to be a primary focus of future treatment research.

The support and assumed competence of the communication partner are very important contributors to the enhancement of communicative competence. Success in communicative

encounters is critical in developing communicative competence, and treatment efforts should set the stage for this success. Some controversial treatment approaches, such as facilitated communication, are more consistent with human intuitions about communication as a joint enterprise than with prevailing teaching practices, which favor independent task mastery without contextual support. This factor may account for some of the recent popularity of facilitated communication, even though reports have identified the unwitting influence of some facilitators on communicative output (Calculator et al., 1995). One positive lesson learned from the experience of facilitated communication is that, rather than putting the burden of communication on the less capable participant in the exchange, the more capable one may have to work harder, providing the amount of compensation necessary to make both communication partners successful (Duchan, 1993). Nevertheless, even as more relevant communicative functions and contexts are increasingly incorporated into intervention programs, the burden of communicative change generally remains on the less competent communicative partner.

This lack of accommodation indicates the insidious power of prevailing linear notions of instruction that favor step-by-step progression contingent on completion of prior program stages and independent task mastery. Such notions of direct instruction may be useful in teaching practical skills that can be effectively task-analyzed, but they may be ill-suited to the teaching of communication and social interaction skills that are more hierarchical and reciprocal in nature. The acquisition of symbolic modes of interaction cannot be divorced from the cultural contexts in which those modes of representation have evolved. As pointed out by Tomasello and colleagues (1993), cultural learning embodies more than earlier conceptualization of social learning, where the child's attention is drawn to specific objects and/or locations in the environment, which otherwise might have gone unnoticed. Although social interactions are critical for this type of learning, the mechanisms involved remain essentially solitary because the specific strategies or methods followed, and the reflection involved, are not shared. According to Tomasello et al., cultural learning involves the adoption of the other's perspective so that one learns through and with another rather than merely from another. The shared perspective allows for the reciprocity inherent in joint attention and turn-taking, and implies the simulation of the other's mental states and eventually the emergence of a theory of mind (Baron-Cohen et al., 1985; Wimmer & Perner, 1983). We argue for the adoption of more reciprocal and collaborative modes of learning to be eventually superimposed on more solitary and object-based modes of learning, which seem more readily established and still predominate in many treatment approaches.

To eventually arrive at more cultural modes of learning, instruction should be built around the interests and initiatives of the individuals involved, even when most or all of such initiatives take unconventional forms. Because the individual with autism or PDD may initially be incapable of establishing a joint focus of attention, reciprocity will fail to be established without such accommodations; communication will remain a one-way enterprise. Close observation and ongoing evaluations of current levels of understanding and competence are, therefore, critical. Such observation should be designed to determine the highest level of competence, given the optimal amount of social assistance and allowing for scaffolded performance within the zone of proximal development, as defined by Vygotsky (1934/1962).

To accomplish these goals, clinicians, educators, and caregivers need to examine their own level of discomfort when common behavior expectations and norms are violated. Are our efforts to impose structure a reflection of our own anxiety and uneasiness, motivating us to reestablish control on our own terms? A directive and controlling stance might make us feel more at ease, but typically leads to power struggles. To provide individuals with autism or PDD with a sense of control and a structure that serves *their* needs, rather than the needs of more competent partners, motivating tasks and activity contexts that support a sense of competence can be selected. Additionally, communicative partners must be willing to scrutinize their own motivations, language use, and communicative style, and then make

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the necessary adaptations to foster success. Consequently, communicative growth is pursued as a collaborative endeavor based on conscious reflection that respects the humanity of persons with autism and PDD.

Family-Centered Principles

Communication enhancement is one dimension of a comprehensive intervention plan for an individual with autism or PDD, and his or her family. The degree of successful communication and interaction between a child and his or her caregivers, peers, and siblings has a significant impact on the parents' sense of competence, the well-being of the family, and the social and emotional well-being of the child (Theadore, Maher, & Prizant, 1990). Thus, the family should be at the center of intervention efforts. Public Law 99-457 (Noonan & McCormick, 1993) and its mandate for interdisciplinary cooperation within a family-centered framework in preschool and early intervention services holds great promise for making the fragmentation of services a thing of the past (Bailey, 1991; Crais, 1991; Kaufmann & McGonigel, 1991). Family-centered practice entails the following major principles: (a) to provide services and supports to the family, as well as the affected child; (b) to foster the family's sense of competence and independence; (c) to respect the parents' right and responsibility to decide what is best for their child; (d) to help mobilize resources for coordinated, normalized service delivery; and (e) to develop a collaborative relationship with the family (Crais, 1991; Dunst, Trivette, & Deal, 1988).

Successful approaches to communication enhancement are achieved through caregiver–professional partnerships. Caregivers should be viewed as primary intervention agents. Whether services are provided in a home- or center-based program, caregivers possess the greatest potential for actuating positive change in the child's communicative abilities (Dunst et al., 1990). Caregivers' ability to enhance communication will be influenced by the formal and informal supports available to them (Bristol & Schopler, 1983; Dunst et al., 1990). Stresses on the family change with the child's age; thus, issues regarding family support are related to specific needs at different points in the life of the family. Families with younger children may just be beginning to experience a grieving process, and may be undergoing dramatic shifts in emotional well-being (Moses, 1981; Prizant & Tiegerman, 1984). Development of communication is critical for younger children; it relates to day-to-day stresses of the family and to long-term prognosis. Stresses on the families of older children and adolescents have been found to be even greater, because of the need to plan for future care and the great demands on a family that is caring for a youth with autism or PDD (Bristol & Schopler, 1983).

Because of the severity of the disabilities that may be associated with autism, it is critical for communication enhancement efforts to address skills that will enhance the individual's ability to be a more effective communicator. Coordination is needed in (a) the use of an interactive style that is most conducive to a child's active participation and communicative growth; (b) the development of strategies for arranging learning environments; and (c) the use of specific approaches to help a child develop more sophisticated means of communication. Some caregivers' perceptions of children's communicative abilities may be skewed toward attributing less or greater competence than is observed by a clinician. In these situations, an important goal is to help caregivers in developing more accurate perceptions or in redefining their perceptions of the children's abilities in a supportive and collaborative problem-solving climate (Theadore et al., 1990).

Providing Services in Inclusive Settings

Over the past decade, there has been a general movement toward providing services for individuals with severe disabilities, including autism and PDD, in inclusive educational and work settings. Inclusive education is mandated by the Individuals with Disabilities Education Act (IDEA) and is considered best practice because it reflects principles of normalization. Inclusive education allows students with disabilities to attend the school that their siblings attend, and to become members of a regular class while receiving

individualized adaptations and support (Ford & Davern, 1989). For a child with autism or PDD, this environment offers actual opportunities to interact with typical peers who can provide appropriate models and be responsive partners when support is needed (Goldstein & Kaczmarek, 1992; Udvari-Solner, 1994; Wolfberg & Schuler, 1993). Research has demonstrated that physical integration, which places students with disabilities among typical nondisabled students, does not ensure social integration, particularly for children with moderate to severe disabilities (Gaylord-Ross, 1989; Odom & McEvoy, 1988; Stainback, Stainback, & Forest, 1989).

The movement toward inclusive education parallels the movement toward positive/nonaversive behavior management. Approaches to discipline must be considered from the perspective of what is acceptable to the community, so that practices can be administered in inclusive settings without infantilizing or stigmatizing an individual. Community-referenced behavioral support should lead to changes that impact on the individual's access to community settings, opportunities for social interaction, and choices of activities to participate in (Horner et al., 1990; Wehman & Kregel, 1985). Ideally, communication intervention should enhance communication so that greater access is provided to a variety of people, places, and events, thereby enhancing the quality of life of individuals with disabilities.

FINAL CONSIDERATIONS

An understanding of the limitations surrounding communication, as well as of the cognitive and developmental idiosyncrasies and the associated behavior problems, is critical in work with persons with autism and PDD, particularly when the focus is on speech and language. For those living or working with persons with autism and PDD, the difficulties discussed herein present a dilemma: much of what it is hoped persons with autism will learn about language and communication, such as greater flexibility in language production and language use, and the ability to adjust communicative behavior to situational contexts, may be particularly difficult because of the social cognitive requirements involved. Stated another way, the flexibility and mutual negotiation that characterize communication in daily interactions may exceed the learning and coping strategies of many persons with autism and PDD, because of the nature of their disability.

Progress in communication and language development must be conceptualized in reference to how far an individual has come in the acquisition of flexible, conventional communicative abilities, rather than by gauging progress on cued production of speech or expectations based primarily on normal developmental milestones. For instance, it is difficult to estimate the extent to which some individuals will be able to engage in uses of language for primarily social ends. Literature on language of more able individuals indicates that language appearing to be social in nature is very often used to carry out predictable routines; the motivation is in the execution of routines rather than in the true social "togetherness" that communication affords. Furthermore, it is not known to what extent a history of frustration and stress experienced in social interactions may inhibit interest and participation in further interaction.

In determining the success of any intervention, it is essential to consider whether the intervention has resulted in meaningful outcomes, not just demonstrable changes. Meyer and Evans (1993) describe a meaningful outcome as a significant change in the individual's lifestyle and human condition. Communication programming should impact on the individual's lifestyle by enhancing meaningful progress in communication abilities that increases access to a variety of people, places, and events. Evans and Meyer (1990) warn that "lifestyle enhancement, such as teaching communication within responsive environments, not 'functional communication training' in isolation, is the fundamental intervention" (p. 135). Ultimately, the individual's competence in social interaction, and his or her capacity to cope with stress by using flexible communicative strategies, will determine the level of independence that can be achieved in adulthood. Chapters 24 and 25 discuss, in greater detail, content areas and specific approaches to the assessment and development of

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REFERENCES

Ainsworth, M.D.
Mother–infant
ment of com
J. Bruner (Ed
(pp. 97–118).
Aram, D.M., & He
review of exti
L.K. Obler &
brain: Neurop
abilities (pp.
Press.
Bailey, D. (1991).
between prof
McGonigel,
(Eds.). *Guide*
for the indivi
ed., pp. 29–3
for the Care
Baron-Cohen, S.
deficits in
Journal of A
ders, 18, 379
Baron-Cohen, S.,
Can autism
needle, the
Journal of Ps
Baron-Cohen, S.,
Does the aut
Cognition, 2
Baron-Cohen, S.,
Mechanical,
standing of
British Jour
4, 113–115.
Bates, E. (1979).
tion and con
Academic P

Behavioral approaches. In J. Matson (Ed.), *Autism in children and adults: Etiology, assessment, and intervention* (pp. 213–240). Pacific Grove, CA: Brooks/Cole.

Crais, E. (1991, September). Moving from "parent involvement" to family-centered services. *American Journal of Speech-Language Pathology, 1,* 5–7.

Curcio, A. (1978). A study of sensorimotor functioning and communication in mute autistic children. *Journal of Autism and Childhood Schizophrenia, 8,* 281–292.

Dawson, G., & Adams, A. (1984). Imitation and social responsiveness in autistic children. *Journal of Abnormal Child Psychology, 12,* 209–226.

Dawson, G., & Galpert, L. (1986). A developmental model for facilitating the social behavior of autistic children. In E. Schopler & G.B. Mesibov (Eds.), *Social behavior in autism* (pp. 237–261). New York: Plenum Press.

De Ruiter, J., & Wansart, H. (1983). *The psychology of learning disabilities.* Rockville, MD: Aspen Press.

DeMyer, M.K. (1975). The nature of neuropsychological disability in autistic children. *Journal of Autism and Childhood Schizophrenia, 8,* 109–128.

DiLavore, P.C., Lord, C., & Rutter, M. (1995). The Pre-Linguistic Autism Diagnostic Observation Schedule. *Journal of Autism and Developmental Disabilities, 25,* 355–379.

Donaldson, M. (1978). *Children's minds.* New York: Norton.

Donnellan, A., Mirenda, P., Mesaros, R., & Fassbender, L. (1984). Analyzing the communicative functions of aberrant behavior. *Journal of the Association for Persons with Severe Handicaps, 9,* 201–212.

Duchan, J.F. (1986). Language intervention through sensemaking and finetuning. In R. Schiefelbusch (Ed.), *Communicative competence: Assessment and language intervention.* Baltimore: University Park Press.

Duchan, J.F. (1993). Issues raised by facilitated communication for theorizing and research on autism. *Journal of Speech and Hearing Research, 36,* 1108–1119.

Dunlap, G., & Kern, L. (1993). Assessment and intervention for children within the instructional curriculum. In J. Reichle & D.P. Wacker (Eds.), *Communicative alternative to challenging behavior—Integrating functional assessment and intervention strategies* (pp. 177–203). Baltimore: Brookes.

Dunst, C., Lowe, E., & Bartholomew, P. (1990). Contingent social responsiveness, family ecology, and infant communicative competence. *National Student Speech Language Hearing Association, 17,* 39–49.

Dunst, C., Trivette, C., & Deal, A. (1988). *Enabling and empowering families: Principles and guidelines for practice.* Cambridge, MA: Brookline Books.

Durand, V.M. (1990). *Severe behavior problems: A functional communication training approach.* New York: Guilford Press.

Durand, V.M., Berotti, D., & Weiner, J. (1993). Functional communication training: Factors affecting effectiveness, generalization and maintenance. In J. Reichle & D.P. Wacker (Eds.), *Communicative alternative to challenging behavior—Integrating functional assessment and intervention strategies* (pp. 317–340). Baltimore: Brookes.

Evans, I.M., & Meyer, L.H. (1985). *An educative approach to behavior problems: A practical decision model for intervention with severely handicapped learners.* Baltimore: Brookes.

Evans, I.M., & Meyer, L.H. (1990). Toward a science in support of meaningful outcomes: A response to Horner et al. *Journal of the Association for Persons with Severe Handicaps, 15,* 133–135.

Fay, W.H., & Schuler, A.L. (1980). *Emerging language in autistic children.* Baltimore: University Park Press.

Ford, A., & Davern, L. (1989). Moving forward with school integration: Strategies for involving students with severe handicaps in the life of the school. In R.G. Ross (Ed.), *Integration strategies for students with handicaps* (pp. 11–31). Baltimore: Brookes.

Frith, U. (1971). Spontaneous patterns produced by autistic, normal, and subnormal children. In M. Rutter (Ed.), *Infantile autism: Concepts, characteristics, and treatment* (pp. 113–133). London: Churchill Livingstone.

Frith, U. (1989). *Autism: Explaining the enigma.* Oxford, England: Blackwell.

Garfin, D., & Lord, C. (1986). Communication as a social problem in autism. In E. Schopler & G. Mesibov (Eds.), *Social behavior in autism* (pp. 237–261). New York: Plenum Press.

Gaylord-Ross, R. (Ed.). (1989). *Integration strategies for students with handicaps.* Baltimore: Brookes.

Goetz, L., Schuler, A.L., & Sailor, W. (1979). Teaching functional speech to the severely handicapped: Current issues. *Journal of Autism and Developmental Disorders, 9,* 325–343.

Goldstein, H., & Kaczmarek, L. (1992). Promoting communicative interaction among children in integrated intervention settings. In S. Warren

& J. Reichle (E
munication and
111). Baltimor
Grandin, T. (1995)
with autism:
(Ed.), *Teaching*
to enhance co
Albany, NY: D
Harding, C., & Goli
intentional voc
fants. *Child De*
Harris, P. (1993
In S. Baron-C
D. Cohen (Eds
Perspectives fr
York: Oxford P
Hart, B. (1985).
techniques. In
Warren (Eds.),
Generalization
skills (pp. 63–8
Press.
Hart, B., & Risley,
of language in
plied Behaviora
Hermelin, B., & O'
cal experiments
England: Perga
Hobson, R.P. (1990)
case of autism.
ology, 2, 163–1
Hoffman, M.L. (19
ference betwee
derstanding th
J.H. Flavell &
development (pp
Cambridge Uni
Horner, R., Dunlap
Sailor, W.,
O'Neill, R. (19
"nonaversive"
the Association
caps, 15, 125–1
Hubbell, R. (1981).
An integrated ap
Prentice-Hall.
Kanner, L. (1943).
tive contact. *Ne*
Kaufmann, R., & M
ing family conc
In M. McGonig
(Eds.), *Guidelin*
for the individu
ed., pp. 47–55
for the Care of
Kiernan, C. (1983).
cation techniq

who received early intensive behavioral treatment. *American Journal on Mental Retardation, 97,* 359–372.

McLean, J., & Snyder-McLean, L. (1978). *A transactional approach to early language training: Derivation of a model system.* Columbus, OH: Charles Merrill.

McLean, L.K.S. (1990). Communication development in the first two years of life: A transactional process. *Zero to Three, 11*(1), 13–19.

Meyer, L., & Evans, I. (1986). Modification of excess behavior: An adaptive and functional approach for educational and community contexts. In R. Horner, L. Meyer, & H. Fredericks (Eds.), *Education of learners with severe handicaps: Exemplary service strategies* (pp. 315–350). Baltimore: Brookes.

Meyer, L., & Evans, I. (1993). Meaningful outcomes in behavioral intervention: Evaluating positive approaches to the remediation of challenging behaviors. In J. Reichle & D.P. Wacker (Eds.), *Communicative alternative to challenging behavior—Integrating functional assessment and intervention strategies* (pp. 407–428). Baltimore: Brookes.

Mirenda, P., & Donnellan, A. (1986). Effects of adult interaction style on conversational behavior in students with severe communication problems. *Language, Speech, and Hearing Services in Schools, 17,* 126–141.

Moses, K. (1981, April). *Mourning theory as related to parents of autistic children.* Paper presented at the National Society for Autistic Children Midwest Regional Conference, Chicago, IL.

Mundy, P., Kasari, C., & Sigman, M. (1992). Joint attention, affective sharing, and intersubjectivity. *Infant Behavior and Development, 15,* 377–381.

Mundy, P., Sigman, M., & Kasari, C. (1990). A longitudinal study of joint attention and language development in autistic children. *Journal of Autism and Developmental Disorders, 20,* 115–128.

Nelson, K. (1981). Social cognition in a script framework. In J.H. Flavell & L. Ross (Eds.), *Social cognitive development* (pp. 97–119). Cambridge, England: Cambridge University Press.

Noonan, M.J., & McCormick, L. (1993). *Early intervention in natural environments.* Pacific Grove, CA: Brooks/Cole.

Odom, S., & McEvoy, M. (1988). Integration of young children with handicaps and normally developing children. In S. Odom & M. Karnes (Eds.), *Early intervention for infants and children with handicaps* (pp. 241–267). Baltimore: Brookes.

Peck, C. (1985). Increasing opportunities for social control by children with autism and severe handicaps: Effects on student behavior and perceived classroom climate. *Journal of the Association for Persons with Severe Handicaps, 4,* 183–193.

Peters, A. (1983). *The units of language acquisition.* London: Cambridge University Press.

Piaget, J. (1971). *The language and thought of the child.* New York: World.

Prior, M. (1979). Cognitive abilities and disabilities in autism: A review. *Journal of Abnormal Child Psychology, 2,* 357–380.

Prizant, B. (1982). Speech-language pathologists and autistic children: What is our role? Part 1. *American Speech-Language-Hearing Association, 24,* 463–468.

Prizant, B. (1983a). Echolalia in autism: Assessment and intervention. *Seminars in Speech and Language, 4,* 63–77.

Prizant, B. (1983b). Language acquisition and communicative behavior in autism: Toward an understanding of the "whole" of it. *Journal of Speech and Hearing Disorders, 48,* 296–307.

Prizant, B. (1987). Theoretical and clinical implications of echolalic behavior in autism. In T. Layton (Ed.), *Language and treatment of autistic and developmentally disordered children* (pp. 65–88). Springfield, IL: Thomas.

Prizant, B. (1988). Communication in autistic clients. In N. Lass, L. McReynolds, J. Northern, & D. Yoder (Eds.), *The handbook of speech-language pathology* (pp. 1014–1039). Toronto, Ontario, Canada: BC Decker.

Prizant, B. (1994, October). *Dimensions to consider in planning and implementing communication and language programs for individuals with autism and PDD.* Seminar presented for State of Connecticut Special Education Directors, Fairfield, CT.

Prizant, B., & Rydell, P. (1984). Analysis of the functions of delayed echolalia in autistic children. *Journal of Speech and Hearing Research, 27,* 183–192.

Prizant, B.M., & Rydell, P.J. (1993). Assessment and intervention considerations for unconventional verbal behavior. In J. Reichle & D. Wacker (Eds.), *Communicative alternatives to challenging behavior: Integrating functional assessment and intervention strategies* (pp. 263–297). Baltimore: Brookes.

Prizant, B., & Tiegerman, E. (1984). Working with language-impaired children: Problems/issues often encountered but (too) rarely discussed.

Journal of the National Student Speech Language Hearing Association, 11, 18–32.

Prizant, B., & Wetherby, A. (1985). Intentional communicative behavior of children with autism: Theoretical and practical issues. *Australian Journal of Human Communication Disorders, 13,* 21–59.

Prizant, B.M., & Wetherby, A. (1987). Communicative intent: A framework for understanding social-communicative behavior in autism. *Journal of the American Academy of Child Psychiatry, 26,* 472–479.

Prizant, B., & Wetherby, A. (1988). Providing services to children with autism (0 to 2 years) and their families. *Topics in Language Disorders, 9,* 1–23.

Prizant, B., & Wetherby, A. (1989). Enhancing language and communication in autism: From theory to practice. In G. Dawson (Ed.), *Autism: Nature, diagnosis, and treatment* (pp. 282–309). New York: Guilford Press.

Prizant, B., Wetherby, A., & Rydell, P.J. (1994). Implications of facilitated communication for education and communication enhancement practices for persons with autism. In H. Shane (Ed.), *Facilitated communication: The clinical and social phenomenon* (pp. 123–155). San Diego, CA: Singular Publishing Group.

Quill, K. (Ed.). (1995). *Teaching children with autism: Methods to enhance communication and socialization.* Albany, NY: Delmar.

Reichle, J., & Wacker, D.P. (Eds.). (1993). *Communicative alternative to challenging behavior—Integrating functional assessment and intervention strategies.* Baltimore: Brookes.

Reichle, J., York, J., & Sigafoos, J. (1991). *Implementing augmentative and alternative communication: Strategies for learners with severe disabilities.* Baltimore: Brookes.

Ricks, D., & Wing, L. (1975). Language, communication and the use of symbols in normal autistic children. *Journal of Autism and Childhood Schizophrenia, 5,* 191–221.

Rimland, B. (1964). *Early infantile autism.* Englewood Cliffs, NJ: Prentice-Hall.

Rogoff, B. (1990). *Apprenticeship in thinking: Cognitive development in a social context.* New York: Oxford University Press.

Rutter, M. (1968). Concepts of autism: A review of research. *Child Psychiatry, 9,* 1–25.

Rutter, M. (1983). Cognitive deficits in the pathogenesis of autism. *Journal of Child Psychology & Psychiatry & Allied Disciplines, 4,* 513–531.

Sameroff, A. (1987). The social context of development. In N. Eisenburg (Ed.), *Contemporary topics in development* (pp. 273–291). New York: John Wiley & Sons.

Sameroff, A., & Chandler, M.J. (1975). Reproductive risk and the continuum of care taking causality. In F. Horowicz, M. Hetherington, F. Scarr-Salapatek, & G. Siegel (Eds.), *Review of child development research* (Vol. 4, 187–244). Chicago: University of Chicago Press.

Schuler, A.L. (1979). *An experimental analysis of conceptual and representational abilities in a mute autistic adolescent: A serial vs. a simultaneous mode of processing.* Unpublished doctoral dissertation, University of California, Santa Barbara.

Schuler, A.L. (1981, November). *The relations between disruptive behavior and communicative deficiencies.* Paper presented at the annual convention of the American Speech-Language-Hearing Association, Los Angeles.

Schuler, A.L. (1995). Thinking in autism: Differences in learning and development. In K. Quill (Ed.) *Teaching children with autism: Methods to enhance communication and socialization* (pp. 11–32). Albany, NY: Delmar.

Schuler, A.L., & Bormann, C. (1983). The interrelations between cognitive and communicative development; Some implications of the study of a mute autistic adolescent. In C.L. Thew & C.É. Johnson (Eds.), *Proceedings of the Second International Congress on the Study of Child Language* (Vol. 2, pp. 269–282). Washington, DC: University Press of America.

Schuler, A.L., & Goetz, L. (1981). The assessment of severe language disabilities: Communicative and cognitive considerations. *Analysis and Intervention in Developmental Disabilities, 1,* 333–346.

Schuler, A., Gonsier-Gerdin, & Wolfberg, P. (1990). Efficacy of speech and language intervention: Autism. *Seminars in Speech and Language, 11,* 242–251.

Schuler, A.L., & Prizant, B. (1985). Echolalia. In E. Schopler & G. Mesibov (Eds.), *Communication problems in autism* (pp. 163–184). New York: Plenum Press.

Sigman, M., & Kasari, C. (1995). Joint attention across contexts in normal and autistic children. In C. Moore & P. Dunham (Eds.), *Joint attention: Its origins and role in development* (pp. 189–203). Hillsdale, NJ: Erlbaum.

Smith, M. (1985). Managing the aggressive and self-injurious behavior of adults disabled by autism. *Journal of the Association for Persons with Severe Handicaps, 4,* 228–232.

Snow, C., Midkiff-Borunda, S., Small, A., & Proctor, A. (1984). Therapy as social interaction:

Analyzing the context for language remediation. *Topics in Language Disorders, 3,* 72–85.

Snyder-McLean, L., McLean, J., Etter-Schroeder, R., & Rogers, N. (1984). Structuring joint action routines: A strategy for facilitating communication in the classroom. *Seminars in Speech and Language, 5,* 213–228.

Stainback, S., & Stainback, W. (1985). *Integration of students with severe handicaps into regular schools.* Reston, VA: Council for Exceptional Children.

Stainback, S., Stainback, W., & Forest, M. (Eds.). (1989). *Educating all students in the mainstream of regular education.* Baltimore: Brookes.

Stern, D. (1985). *The interpersonal world of the infant.* New York: Basic Books.

Tanguay, P. (1984). Toward a new classification of serious psychopathology in children. *Journal of the American Academy of Child Psychiatry, 23,* 373–384.

Theadore, G., Maher, S., & Prizant, B. (1990). Early assessment and intervention with emotional and behavioral disorders and communication disorders. *Topics in Language Disorders, 10,* 42–56.

Tomasello, M., Kruger, A.C., & Ratner, H.H. (1993). Cultural learning. *Behavioral and Brain Sciences, 16,* 495–552.

Tronick, E. (1989). Emotions and emotional communication in infancy. *American Psychologist, 44,* 112–119.

Turnbull, A. (1991). Identifying children's strengths and needs. In M. McGonigel, R. Kaufmann, & B. Johnson (Eds.), *Guidelines and recommended practices for the individualized family service plan* (2nd ed., pp. 39–46). Bethesda, MD: Association for the Care of Children's Health.

Udvari-Solner, A. (1994). A decision-making model for curricular adaptations in cooperative groups. In J. Thousand, R. Villa, & A. Nevin (Eds.), *Creativity and collaboration: A practical guide to empowering students and teachers* (pp. 59–77). Baltimore: Brookes.

Vygotsky, L.S. (1962). *Thought and language.* Cambridge, MA: MIT Press. (Original work published 1934)

Wehman, P., & Kregel, J. (1985). A supported work approach to competitive employment of individuals with moderate and severe handicaps. *Journal of the Association for Persons with Severe Handicaps, 10*(1), 3–11.

Wertsch, J.V. (Ed.). (1985). *Culture, communication, and cognition: Vygotskian perspectives.* Cambridge, England: Cambridge University Press.

Wetherby, A. (1986). The ontogeny of communicative functions in autism. *Journal of Autism and Developmental Disorders, 16,* 295–316.

Wetherby, A., Cain, D., Yonclas, D., & Walker, V. (1988). Analysis of intentional communication of normal children from the prelinguistic to the multi-word stage. *Journal of Speech and Hearing Research, 31,* 240–252.

Wetherby, A., & Prizant, B. (1989). The expression of communicative intent: Assessment guidelines. *Seminars in Speech and Language, 10,* 77–91.

Wetherby, A., & Prizant, B. (1992). Facilitating language and communication development in autism: Assessment and intervention guidelines. In D. Berkell (Ed.), *Autism: Identification, education, and treatment.* Hillsdale, NJ: Erlbaum.

Wetherby, A., & Prizant, B. (1993). Profiling communication and symbolic abilities in young children. *Journal of Childhood Communication Disorders, 15,* 23–32.

Wetherby, A., & Prutting, C. (1984). Profiles of communicative and cognitive-social abilities in autistic children. *Journal of Speech and Hearing Research, 27,* 364–377.

Wills, D.M. (1979). Early speech development in blind children. *Psychoanalytic Studies of the Child, 34,* 85–117.

Wimmer, H., & Perner, J. (1983). Beliefs about beliefs: Representation and constraining function of wrong beliefs in young children's understanding of deception. *Cognition, 13,* 103–128.

Wing, L., & Gould, J. (1979). Severe impairments of social interaction and associated abnormalities in children: Epidemiology and classification. *Journal of Autism and Developmental Disorders, 9,* 11–29.

Wolfberg, P.J., & Schuler, A.L. (1993). Integrated play groups: A model for promoting the social and cognitive dimensions of play in children with autism. *Journal of Autism and Developmental Disorders, 23,* 467–489.

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