In. D. Cohen & F. Volkmar (Eds.) (1997) Handbook of Autism & Pervasive Developmental Disorders

CHAPTER 24

Enhancing Language and Communication Development: Prelinguistic Approaches

ADRIANA L. SCHULER, BARRY M. PRIZANT, AND AMY M. WETHERBY

This chapter focuses on individuals with autism and Pervasive Developmental Disorder (PDD) who exhibit the greatest limitations in communication. They are described as prelinguistic or, in the most extreme cases, preintentional (those who do not yet communicate with clear purposes or intentions). Enhancing the communication abilities of these persons is indeed a challenge; thus far, intervention efforts have met with only limited success. In the past, many prelinguistic individuals were excluded from language intervention services because of the severity of their attentional and behavioral challenges. Contemporary approaches have integrated communication and behavioral goals, replacing fragmented remedial efforts with more comprehensive and holistic approaches to communication enhancement. Highly structured data-based interventions with a behavioral orientation have typically included the most severely communication-impaired persons with autism and PDD, but these efforts have only been partially successful, at least as far as can be ascertained from the data reported (Goetz, Schuler, & Sailor, 1979; Schuler, Gonsier-Gerdin, & Wolfberg, 1990).

The effectiveness of traditional behavioral approaches in systematic skill building and behavioral control for individuals with severe disabilities has been amply documented; however, fewer advances have been made when similar techniques have been applied to the domains of communication and language. Treatment outcome has typically been disappointing when criteria of spontaneous use and generalization have been applied (Howlin, 1981; Schuler et al., 1990). As discussed in Chapter 23, a disproportionate emphasis on training of externally cued response topographies in contrived rather than natural social contexts may be at fault. This type of approach, although useful for specific instruction in discrete skills, runs counter to the dynamic and interactive nature of communicative transactions.

Shifting philosophies and treatment perspectives are reflected in more current efforts. Primarily, a greater appreciation of the functions of communication is apparent both among developmental treatment approaches, as evidenced by an increased focus on the pragmatics of communication, and within contemporary behavioral circles (Reichle & Wacker, 1993). Innovations in the use of behavioral treatment practices, drawing largely from the pragmatics of communication literature, acknowledge the various functions of communicative acts in more natural environments and the primacy of self-initiated and reciprocal communication as opposed to compliance training. These innovations have served to mitigate and even preclude some of the commonly encountered behavior problems that may be observed in autism and PDD. (For a more detailed discussion, see Carr, 1985; Carr & Carlson, 1993; Charlop & Haymes, 1994; Hart, 1981; Koegel, Camarata, & Koegel, 1994.) As discussed in Chapter 23, these recent trends are incorporated into the treatment philosophy and guidelines presented in this chapter. The approaches espoused in this chapter are also augmented by these other sources: (a) a pragmatic view of communicative competence, referring to the use of multiple

communicative means serving multiple communicative functions or purposes; (b) insights into early communicative development, with emphasis on the importance of supportive scaffolded interactions with relevant others (Bruner, 1975; Dunst, Lowe, & Bartholomew, 1990; Snow, Midkiff-Borunda, Small, & Proctor, 1984); (c) the explosion of technology supporting communication enhancement practices that recognize that nonverbal modes of communication must be utilized when prognosis for the development of functional speech is limited (Beukelman & Mirenda, 1992; Reichle, Sigafoos, & York, 1991); (d) an emerging understanding of the learning mechanisms involved in the acquisition of cultural as opposed to more object-referenced knowledge (Tomasello, Kruger, & Ratner, 1993); and (e) insights that have been acquired from recent research dealing with the "culture of play" and play-based interventions for children (Wolfberg, 1995; Wolfberg & Schuler, 1993).

This chapter first discusses the interrelationships between the severe communication disability associated with preverbal levels of representation and the related behavioral difficulties. This is followed by a discussion of the particular challenges presented by individuals who may be not only prelinguistic but also preintentional. The key themes of these discussions pertain to: limitations in the expression of communicative intent, the unevenness of developmental profiles, the associated behavior excesses frequently observed, and the challenges these issues present for both assessment and intervention efforts. Next, assessment principles and practices, and related intervention approaches, are discussed. Specific examples will be given of how communication goals are selected that are commensurate with the assessed levels of communication skills. While close interrelationships exist between communication assessment and intervention, these issues are, however, discussed separately for the sake of organizational clarity.

The term *communication*, denoting a range of purposeful behavior, is used with varying degrees of intentionality within the structure of social exchange to transmit information, observations, or internal states, or to bring about changes in the immediate physical environment. Verbal as well as nonverbal behaviors are included, as long as some intent, evidenced by anticipation of outcome, can be inferred. This usage implies that not all vocalizations (or even all speech) qualify as intentional communicative behavior. Not all vocalizations are used for communicative purposes; they may be produced in the context of other "self-stimulatory" or self-directed behavior for no apparent purpose other than the provision of sensory feedback.

The term *prelanguage* is used to denote communicative behavior that lacks formal grammatical organization and symbolic reference. For instance, an individual might effectively use certain memorized echolalic or "gestalt" phrases for communicative purposes, but is unable to segment them into the individual words that constitute their internal makeup. Chapter 25 addresses the communicative behaviors of more able individuals—those who are capable of intentional linguistic communication, and who are functioning at the one-word or short-phrase level, or beyond, thus demonstrating at least the roots of symbolic thinking.

CHALLENGES AND ISSUES AT PRELINGUISTIC LEVELS

Establishing Intentionality

A prime challenge in working with nonspeaking individuals with autism and PDD is that many are preintentional as well as prelinguistic. This may well be the ultimate communication disorder; not only do more effective means of communication need to be learned, but, most importantly, the basic notion of communication has not yet been acknowledged. Because communication hinges on the anticipation of outcomes of one's own and of others' behavior, progress can be inferred when the autistic individual starts to anticipate particular memorized outcomes in association with his or her own behavior (e.g., hand and body movements, vocalizations). When the individual is starting to look for the effect of his or her actions, significant progress is being made toward intentional communication. Further progress is indicated when he or she realizes that the anticipated outcomes are mediated by the actions of communication partners. For

instance, anticipation is evident when approaching a snack an individual starts to touch a communication picture symbol in anticipation and/or manually approximates the sign "eat." The most critical progress is made when that same individual is starting to shift his or her gaze between the snack and an adult who is close by, particularly when that gaze is accompanied by a reaching motion and/or a change in body orientation.

To promote true communicative progress, communicative function should supersede form or structure. Too often, individuals are drilled on the correct production of particular speech sounds, words, signs, or even a "whole sentence" without any grasp of intentional communication. As impressive as the speech produced may sound, this kind of drill is counterproductive because it is likely to generate situation-specific behavior that fails to generalize or to be used spontaneously (Fay & Schuler, 1980; Greenspan, 1992; Prizant, 1982). Moreover, the prompted behaviors may be produced out of context—for example, when a particular level of distress or agitation is being associated with one well-memorized phrase, such as "May I go potty, please," that is being uttered as a preintentional protest against the unpredictability of a change in routine. Thus, apparent gains in speech may mask minimal communicative competence, foster negative attention, and due to unrealistic expectations, invite behavior problems.

Uneven Developmental Profiles (Developmental Discontinuities)

Communicative limitations are often not recognized because so many individuals with autism and PDD have proficiencies in other areas, and these proficiencies may mask their lack of understanding of the world of person-related cause and effect and intentionality. This masking occurs especially when the individual involved is occasionally observed to repeat the speech of others, but not for communicative purposes. For instance, an individual may say "Don't hit," when close to another individual who is being hit, but without paying any attention to the unfolding scene. As explained by Prizant and Rydell (1984, 1995), such a delayed echolalic act of speech production may function merely as a "situation association" echo—a situation-specific memorization of a particular phrase, which may further be associated with certain states of arousal or agitation.

When the delayed echolalic nature of the utterance is not understood by others, there may be considerable confusion about the level of communicative competence to be inferred. Typically, an individual may be accused of "negativism," of "withholding," or of simply not doing his or her best when failing to use language. Such attributions are readily made when excellent situational recall skills allow for the production of contextually appropriate utterances. These may, nevertheless, be created without specific communicative intentions. Unfortunately, this type of echolalia may lead parents, clinicians, and teachers to believe that these individuals would be able to talk creatively if they were sufficiently pressured. Such false assumptions can easily lead to unproductive power struggles. This type of scenario may serve to underscore the importance of a comprehensive assessment designed to provide a true picture of communication skills and related levels of development across contexts.

The magnitude of the developmental discontinuities encountered in autism and PDD makes the gathering of pertinent and valid assessment data most challenging. In making comparisons across areas of assessment, differentiations need to be made between domains of knowledge that are dependent on social knowledge as opposed to knowledge of objects and spatial relations. The authors have found many discrepancies along those dimensions. Consistent with Kanner's (1943) seminal writings, object knowledge almost always exceeds person knowledge. The most extreme discrepancy we ever encountered pertained to a preintentional level of communicative and social knowledge (roughly estimated at a 6 months age level) in the presence of astounding knowledge of objects and spatial relations (roughly estimated at beyond 9 years of age). (For an in-depth discussion, the reader is referred to Fay & Schuler, 1980; Papy, Papy, & Schuler, 1995; Schuler, 1995; or Schuler & Watanabe, 1995.) A pervasive lack of communicative understanding and of the related skill discrepancies sets the stage for the severe

behavioral challenges that are so commonly encountered, especially in preverbal individuals.

Behavior Ramifications

As pointed out in Chapter 23, the close interrelationships between communicative deficiency and challenging behavior often have been overlooked. What should be taken into account is that much "aberrant" behavior may serve communicative functions in a preintentional or semi-intentional way. For instance, self-injury, tantrums, stereotyped echolalic routines, and so on, may be the only available means by which an individual with autism or PDD can create an impact on the environment, or at least make predictions about it and test his or her hypotheses. Such behaviors may serve to terminate an unpleasant situation, to secure physical contact and/or attention, to initiate or regulate a social interaction, and so on. (For a more detailed discussion of these issues, see Carr, 1977; Carr et al., 1994; Schuler & Goetz, 1981; Schuler & Prizant, 1985; Weeks & Gaylord-Ross, 1981.)

The prevalence of undesirable communicative means suggests that communicative competence would be enhanced if such inappropriate means could be replaced by more socially acceptable, conventional, and mutually satisfactory forms of communication. This suggestion implies that behavior management and communication skill-building efforts are interdependent and closely integrated. In other words, the functional analysis of challenging behavior should guide communication programming (Durand, 1990). For instance, if an individual's temper tantrums and self-injurious behaviors typically occur when daily schedules are violated, or when activities are imposed that seem to be disliked, these behaviors are likely to serve a protest function. Functional analysis of the pattern of behaviors and situational context involved should be completed, including antecedents as well as consequences. (For detailed guidelines, see Carr et al., 1994; Durand, 1990.) If the behaviors involved indeed serve a protest function, more appropriate means to express protest functions need to be taught. For instance, a pictorial or written-word symbol, or a formalized hand or other body movement may be introduced.

The most effective behavior management approach is one that incorporates an analysis of the communicative functions of the behaviors of concern into a comprehensive program that involves teaching more mutually satisfying and more adaptive alternatives. The selection of teaching activities that are functional, meaningful, and motivating, as well as manageable, will serve to prevent many behavior problems.

Alternatives to Speech Communication

In many cases, speech may not be the most viable mode of communication and may not constitute a reasonable short-term objective. It is generally assumed that about half of all persons with autism and PDD never develop functional speech (Fay & Schuler, 1980; Prizant, 1988). Not only do we often observe a lack of expressive speech, but the comprehension of others' speech tends also to be limited despite some situational understanding. Language is often only understood in highly familiar contexts, and, most likely, the individual is not responding to the speech but to the routine within its situational context, or to other cues such as gestures and location in space. Our own clinical experience has convinced us that, for prelinguistic individuals, it is desirable to reduce and/or simplify speech input and to supplement it with visual information, manual demonstration, and contextual support. Another accommodation to the limited comprehension of speech lies in the use of a highly structured—and therefore predictable—environment that incorporates routine interactions, predictable time schedules, and clear spatial layouts of living and learning spaces, schedules, and so on.

When speech does not seem feasible as a primary mode of communication, alternative or augmentative modes of expression need to be introduced along with the expansion of natural gestures. Research and clinical reports have documented the effective use of nonspeech means to augment communication and develop literacy skills in sign language, communication boards, picture books, and computers for persons with autism, PDD, and other disabilities. (For reviews, see Bedrosian, 1996; Beukelman & Mirenda, 1992; Bishop, Rankin, & Miren
Yoder, 1992; McN
Mirenda & Schuler
Schuler & Baldwi
Gerdin, & Wolfber
ing findings, many
the introduction of
munication will in
Fortunately, this fa
available research
rience. Spontaneo
vocal output are t
one-third to one-ha
dividuals who lea
through other mode

Decisions about
tems of communic
an individual basi
1992; Reichle et
Schuler, Peck, Will
will be discussed
sions should be bas
of current commun
the demands of cu
ing and learning e
many individuals w
been found to bene
of augmentation th
visual-spatial mani
reference to visual
over time, allowing
nation. This featu
boards, written wo
tems from sign lan
rates transient or fl
(For a more detaile
& Schuler, 1988.) T
tated communicatio
explained by the fac
ten words, graphic s
all of which are pre
mode.

Joint Attention and

The biggest challeng
tive competence pro
pand the repertoire
to include more soc
greater reciprocity
communication (We
Typically, the great

Rankin, & Mirenda, 1994; Koppenhaver & Yoder, 1992; McNaughton & Lindsay, 1995; Mirenda & Schuler, 1988; Reichle et al., 1991; Schuler & Baldwin, 1981; Schuler, Gonsier-Gerdin, & Wolfberg, 1990.) Despite encouraging findings, many people continue to fear that the introduction of a nonspeech mode of communication will inhibit speech development. Fortunately, this fear is not supported by the available research or by our own clinical experience. Spontaneous increases in speech or vocal output are typically observed in about one-third to one-half of those nonspeaking individuals who learn to express themselves through other modes.

Decisions about specific modes and systems of communication should be made on an individual basis (Beukelman & Mirenda, 1992; Reichle et al., 1991; Schuler, 1985; Schuler, Peck, Willard, & Theimer, 1989). As will be discussed in more detail, those decisions should be based on a careful examination of current communicative repertoires and of the demands of current and subsequent living and learning environments. Nevertheless, many individuals with autism and PDD have been found to benefit most from those forms of augmentation that code information in a visual-spatial manner. This term is used in reference to visual stimuli that remain present over time, allowing for repeated visual examination. This feature distinguishes picture boards, written words, or related symbol systems from sign language, which also incorporates transient or fleeting visual information. (For a more detailed discussion, see Mirenda & Schuler, 1988.) The recent interest in facilitated communication (FC) is at least partially explained by the fact that it incorporates written words, graphic symbols, and/or keyboards, all of which are presented in a visual-spatial mode.

Joint Attention and Action

The biggest challenge in enhancing communicative competence probably lies in the need to expand the repertoire of communicative functions to include more social purposes, allowing for greater reciprocity and mutual enjoyment of communication (Wetherby & Prizant, 1993b). Typically, the greatest success is in teaching more socially acceptable ways to request objects or actions, as well as ways to protest against changes in environment, interruptions of routines, increased demands, and so on. In other words, communication alternatives are most easily acquired as long as the communication centers around objects and the maintenance of order in the physical environment. However, more socially referenced forms of communication are often lacking in the communicative repertoire and present much greater challenges. When more advanced communicative behaviors appear, the range of communicative functions displayed typically remains restricted to immediate needs and environmental ends (i.e., communicating to regulate others' behavior; Fay & Schuler, 1980; Wetherby, 1986). To allow for the conventionalization of behavior and affect, it is critical that communication is established to share experiences (i.e., to establish joint attention) and to increase reciprocity between an autistic individual and a caregiver. It is important for the individual to learn to take turns and to participate in shared activities and, ultimately, shared affect. Our own research suggests that supported play with more competent peers (Wolfberg & Schuler, 1993) may be not only the most effective but also a most enjoyable vehicle for teaching more socially referenced communication and for normalizing affect.

ASSESSMENT AND INTERVENTION DOMAINS AND APPROACHES AT PRELINGUISTIC LEVELS

Before embarking on a more detailed discussion of assessment and intervention strategies, our guiding philosophy should be stated clearly. We believe that, first and foremost, the competencies and needs of the individuals involved should be considered. Second, environments that invite and are responsive to social and communicative interactions should be created, to help foster communicative competence.

Promoting Competence

When dealing with individuals with severe communicative limitations, the experience of communicative success is of paramount

importance. As discussed in Chapter 23, to accomplish this goal, we advocate moving away from orientations that focus too narrowly on deficiencies, despite the obvious severity of the disabilities involved. A person's learning strengths, motivations, and preferred activities and relationships should be acknowledged. It is equally important to reexamine communication as a transactional phenomenon that involves at least two or more individuals and serves a range of different social and cognitive functions. Although the burden of changing behavior has traditionally been placed on the most disabled communication partner, important accommodations for communicative success can be made by pertinent others. Both the context and the interactional style of the communication partners need to be targeted in intervention efforts. (For a discussion of these matters, see Duchan, 1989; Kaiser & Goetz, 1993; Peck, 1986.) After all, communication is a transaction between two or more individuals in a given social context (Prizant & Wetherby, 1989) that allows the more competent partners to compensate for the disabled partner's communicative limitations. In doing so a scaffold is provided for the development of new skills.

Concerning interaction style variables, nurturant response styles that acknowledge even the most minimal initiations are most likely to enhance communicative skills than are less responsive and more controlling response styles, especially for persons with very limited communication ability (Duchan, 1983; Dunst et al., 1990; Peck, 1989). Similarly, play interventions that incorporate adult-mediated peer responses to even the slightest approximations of appropriate play interactions were found to be highly effective in promoting play behaviors (Wolfberg & Schuler, 1993). The design of interventions to promote play and social interactions thus becomes a matter not only of specifying desirable changes in child behavior, but also of specifying desired changes in adult interaction style.

Concerning context variables, we need to determine which contexts and learning situations invite the most competent communicative initiations (Koegel & Johnson, 1989; Peck, 1989; Rowland & Schweigert, 1993). In doing so, a combination of motivational and cognitive issues should be considered. For instance, an individual with limitations in means–end behavior may exhibit communicative behavior only in a structured routine context and not in a more generative, spontaneous manner, because his or her understanding of communication as a process to achieve specific goals is limited. Similarly, an individual without object permanence will lack the motivation to request objects and/or activities that are remote and abstract. The task of the communicative partner (i.e., the caregiver, clinician, teacher) is to stage contexts that invite success and, ultimately, the experience of communicative efficacy. Developmental information is thus sought in an effort to select a proper level of task adaptation rather than as a goal by itself. The social and cognitive approach we advocate in Chapter 23 demands that current knowledge and cognitions are taken into account so that successful learning can be planned in a context that makes sense to the individual involved.

To provide the type of intervention approach that is advocated, alternatives to standardized and other traditional forms of assessment tools must be used. (For a further discussion of these issues, see Halle, 1993; Prizant & Wetherby, 1985, 1993a; Schuler & Perez, 1991.) For instance, the value of traditional behavior checklists, which reduce assessment to measuring the frequency of desirable and/or undesirable behaviors, and which tend to be context-free, is questionable for our purposes. Rather than identify and/or measure deficiencies, assessment should pinpoint enabling factors. The tools selected should allow for the evaluation of communicative behavior in natural contexts that demand close involvement of teachers, parents, siblings, peers, and pertinent others who may have important observations to share. Similarly, it is imperative that interventions are not limited to one specific setting, so that the individual involved is able to experience communicative success throughout the day. Use of a number of different settings and interactants creates an environment that is conducive as well as responsive to communicative and social initiations. Again, these concerns demand close collaboration with parents and family members or other pertinent caregivers. For such collaboration to take

place, it is critical that parents or pertinent others have an active voice in the assessment process as well as in the design of the overall intervention program.

Because people with autism and PDD are more limited in their ability to acquire skills that are normally "assimilated" from interactions with others, the primary goal of an intervention program is to break down modes of noninteraction or minimal interaction and to provide for more social modes of communication. When these modes are not accessed, the lack of socially constructed knowledge becomes only more profound over time. Intensive interventions that support social learning—for example, incidental teaching (for a discussion, see Halle, 1993), use of joint action routines, and other socially based strategies—are thus of critical importance, particularly when services are provided to very young children and their families (Harris & Handleman, 1994). Fortunately, increasing numbers of children and their families are being identified and served at a much earlier age. Encouraging results from intense early intervention efforts have been documented in the literature (see Birnbrauer & Leach, 1993; Greenspan, 1992; Kalmanson & Pekarsky, 1987; Lovaas, 1987; McEachin, Smith, & Lovaas, 1993; Rogers, 1995; Scheinkoph & Siegel, in press; Siegel, 1996) and have been observed in our clinical practice. The earlier parents are supported in establishing more reciprocal modes of interaction and more conventionalized patterns of actions and attention, the greater the chances of self-regulation and communicative efficacy (Dunst et al., 1990; Greenspan, 1992; Prizant & Meyer, 1993).

Assessment Principles

Traditional formal communication assessment approaches focus primarily on the structure or form of language and rely on elicited responses. Because communication impairments associated with autism and PDD are most apparent in the area of social use of communicative acts, most formal communication assessment instruments have limited utility other than for establishing developmental levels, particularly for preverbal individuals. Wetherby and Prizant (1993a) identified several major limitations of the most frequently used formal communication assessment instruments for individuals with limited language abilities. First, most instruments are not family-centered. They do not allow for the family to collaborate in decisions about the assessment process, nor to participate to the extent desired by the family members. Second, most instruments involving direct assessment are primarily clinician-directed. The individual being evaluated is placed in a respondent role, which limits observations of spontaneously initiated communication. Third, most formal instruments emphasize language milestones and forms of communication (e.g., number of different gestures, sounds, words, word combinations), rather than use of communicative acts in everyday interactions, and the social-communicative and symbolic foundations of language and communicative competence.

Current theories on how children acquire language (Bates, 1979; Lahey, 1988) suggest that the following features are critical to the assessment of language and communication in individuals with significant social-communicative problems:

1. Communication and language should be assessed within an interactive, meaningful context in which each person is encouraged to initiate communication.
2. If possible, the caregiver should be integrally involved in the assessment as an active participant, as an informant about the individual's competence and performance, and as a collaborator in decision making;
3. Assessment should not only identify relative developmental weaknesses, but should also provide information about relative strengths in communication and related areas of development.
4. Assessment should be viewed as a dynamic process in which an individual's capacity for developing communicative competence is understood over time.

Thus, there is a critical need (a) to move toward more authentic assessment of persons with autism and PDD by ensuring the ecological validity of assessment practices (Damico, Secord, & Wiig, 1992), and (b) to utilize dynamic assessment to explore aspects of contexts that

support or impede an individual's acquisition of communicative competence (Olswang, Bain, & Johnson, 1992; Schuler, 1989).

Assessment of social communication and related abilities is most relevant when it pinpoints specific treatment goals and teaching strategies—that is, when it provides specific directions for intervention. The limitations in intentional communication and language comprehension, and the associated developmental discontinuities and behavior problems make it very difficult to use standardized instruments. A variety of assessment techniques may be used, as long as they are indicative of current ability levels and provide direction for how communication abilities may be expanded.

The framework presented in the previous chapter (see Table 23.1) can be used as a guide for determining domains that need to be assessed. (More specific assessment questions that need to be addressed at this level are summarized in Table 24.1.) Following is an overview of important considerations for assessment of prelinguistic individuals with autism and PDD, using a social communication assessment framework.

Assessment Domains

Expressive Communicative Means

Preverbal individuals, by definition, show limited ability to express themselves through oral language. Therefore, communication assessment should identify the range of communicative means or behaviors used to express intentions (see Table 24.2). Persons with autism and PDD often use unconventional, idiosyncratic, or challenging behavior to communicate for various functions (Carr & Durand, 1985; Donnellan, Mirenda, Mesaros, & Fassbender, 1984; Schuler & Goetz, 1981; Wetherby & Prutting, 1984). Therefore, a lack of conventionality or social acceptability should not preclude the possibility that a behavior is being used purposefully to communicate. The degree of conventionality and social acceptability of the individual's entire repertoire of communicative behaviors should be considered. Additionally, the sophistication of preverbal communication should be considered. Gestures may range from primitive contact gestures, such as physical manipulation of another person's hand, to distal gestures in which there is no physical contact, such as pointing or depictive gestures (i.e., pantomime gestures). Vocal communication may range from vowels that are differentiated on the basis of affective state (e.g., excitement versus distress) to mono- or multisyllabic vocalizations of consonants and/or vowels, some of which may approximate speechlike forms.

As far as speech output is concerned, pertinent questions revolve around the ability to repeat or approximate speech, and, perhaps more importantly, to use vocalizations for intentional purposes. It should be determined whether vocalizations and/or some form of echoing may be used intentionally for communicative purposes. (See Chapter 25 for further discussion of echolalia and other forms of unconventional verbal behavior.) For instance, can some form of speech imitation be prompted? Is there any evidence of apraxic involvement that affects the motor-planning capacities of the oral musculature, as well as bodily movement and coordination?

TABLE 24.1 Examples of Core Prelanguage Assessment Questions

Does the student exhibit intentional communicative behavior?
Through which means does the student communicate?
Which communicative functions may be inferred from behavioral observations?
Does the student utilize multiple means to achieve communicative functions? If so, for which functions?
Does the student exhibit repair strategies when communicative ends fail to be met? If so, which ones?
Is the student able to initiate, respond, and/or maintain a communicative exchange?
Which contexts are most facilitative of communicative behavior?

Receptive Language and Communication

It is also important to assess the level of language comprehension so that service providers and family members can use this information to adjust their language level to promote successful interactions. It should first be determined whether the individual's language

TABLE 24.2 Summary of Communicative Means, with Some Examples and Definitions

Communicative Means	Description
Crying, tantrums/Self-injury, proximity	Physical closeness to others and/or objects.
Passive gaze	Eye contact without attempts to direct the other's gaze or focus of attention.
Active gaze	Eye contact with attempts to direct the gaze of others.
Grabs/Reaches	May be responded to by others as being a request for an object, particularly when combined with gaze and/or vocalization.
Vocalization	A wide range of vocal acts and/or "noises."
Self-removal	Running away or disappearance may be used as a form of protest.
Reenactment (rituals)	Reenactment of partial or entire behavior sequences associated with a desired outcome (e.g., requesting to go out shopping by collecting jacket, car keys, etc.).
Physical manipulation	Physically moving other person to have him or her perform a desired action. May also be a reenactment (e.g., requesting to be tickled by placing someone else's hand on the desired location).
Giving/Showing objects	Handing a toy to someone in an effort to establish joint attention and reference.
Pointing (contact or distal)	Indicative hand gesture denoting attention toward or request for object or action. Distinct from reaching and actual physical contact.
Gesturing	Natural gestures such as pushing away, making a palm-up request, giving; distinct from signing and stereotyped body manipulations.
Intonation	Variations in vocal pitch, volume, or duration.
Aggression	Pushing, kicking, biting, pinching directed toward another individual.
Echolalia	Delayed or immediate repetition of the speech of others; may vary in situational appropriateness and degree of intent.
Single-word speech	
Single-word signs	
AAC system use (e.g., pictures)	

Note: The behaviors listed, particularly those that are least conventional and symbolic, may vary in intentionality.

comprehension is at a prelinguistic or linguistic level (Lord, 1985). Assessment of receptive communication should include an individual's ability to receive and respond to others' communicative signals. A full audiological assessment relevant to an individual's developmental level may need to be conducted to assess hearing status. An individual's ability to respond to communicative signals in natural environments—for example, communicative gestures, vocalizations, words, and multiword utterances—should also be documented. A primary determination is whether speech signals convey any information to the autistic individual. Although this seems a rather straightforward matter, such determinations are not always easily made. Because many individuals have good recall of sequences of events and may learn to respond to an overall contextual "gestalt," they may respond appropriately to everyday instructions given in a predictable context. The linguistic comprehension skills of individuals can be easily overestimated because of their use of situational cues and their memorization of daily routines. A correlate of gestalt processing may be inferred when individuals show a contextual comprehension of an utterance as a whole but are unable to respond correctly when a few words are altered, intonation is changed, or other minor revisions occur. An in-depth assessment of comprehension skills should thus examine what happens when standard instructions are altered in a variety of daily contexts. (For a more detailed discussion of assessment strategies, see Peck & Schuler, 1987; Peck, Schuler, Tomlinson,

Theimer, & Haring, 1983; Wetherby & Prizant, 1992a; for a more detailed discussion of nonlinguistic comprehension strategies, see Chapter 25.)

When an individual can comprehend linguistic aspects of a message, it is important to determine whether he or she is able to comprehend single words within the message, multiword combinations guided by semantic relations (i.e., understanding based on knowledge about word classes and relations), grammatical constructions (i.e., syntactic and morphological rules), or connected discourse. The individual's language comprehension level should contribute to the selection of suitable augmentative communication systems; that is, individuals with greater comprehension skills show more readiness for a symbolic communication system.

Social-Communicative and Socioemotional Abilities

Assessment of communication should determine the communicative functions expressed by an individual as well as the repertoire of behaviors used for communicating. If an individual is at a preintentional level (i.e., does not demonstrate any deliberate, goal-directed communication), assessment should identify behaviors that serve a communicative function based on others' interpretation of these behaviors. The triad of functions defined by Bruner (1981)—behavior regulation, social interaction, and joint attention—is particularly useful in assessing individuals with autism and PDD. Wetherby (1986) has suggested that, for individuals with autism and PDD, the easiest and first emerging communicative function is behavior regulation, and the most difficult function is referencing joint attention, presumably because of the differing social underpinnings of these abilities.

Persons with autism and PDD also evidence difficulty with the reciprocity of communication. Assessment should consider the individual's ability to synchronize and regulate turn-taking interactions (Dawson & Galpert, 1986). Additionally, it is important to assess the individual's ability to repair communication breakdowns; that is, when an individual's attempt to communicate is unsuccessful, what strategies are used to repair? Does the individual at least repeat the communicative signal to persist in communicating, or is the individual able to modify the signal to clarify the communicative intention? Because individuals with autism may be faced frequently with communication breakdowns, repair strategies are critical for successful communicative interactions.

Use of social-affective signals, including facial expression and displays of affect, gaze behavior, vocalizations, and other behavior reflecting emotional and physiological states, should be assessed. Individuals with autism often demonstrate limited use of gaze shifts to regulate interactions, and their emotional states may be difficult to read because of a limited range of affect expression (Prizant & Wetherby, 1990).

Assessment of social relatedness is an important component of a thorough communication assessment because communicative competence will depend, to a great extent, on an individual's social knowledge and social relationships. Social relatedness may be defined as an individual's motivation to be with, to be like, to share feelings with, and to learn from others (Prizant, 1986; Prizant & Meyer, 1993). This entails knowledge of social conventions of behavior and an understanding of others' motivations and intentions. Dimensions of social relatedness that may be assessed include social orientation (interest in being with or observing others), attachment (selective orientation toward an individual who may serve as a base of security), joint reference (the ability to establish and maintain shared attention with others), imitation (the ability to repeat actions or speech of others for social ends, or to learn from others), emotional expression (the ability to express emotional states in a readable manner), empathy (the ability to understand the emotional perspective of others), and knowledge of social rules and conventions (understanding rules of social behavior in different contexts and modifying behavior accordingly) (see Chapter 25 for further discussion). The appropriateness of nonverbal behavior in communicative interactions may also be assessed as to its role in supporting or inhibiting social exchange and communication interactions (Wetherby & Prizant, 1990).

In assessing social interaction, the present authors have mostly relied on direct observation in unstructured and semistructured

contexts. The Social Interaction Observation Guide (see also Peck & Schuler, 1987) or, more formally, the Communication and Symbolic Behavior Scales for younger children (Wetherby & Prizant, 1993a, 1993b) have been helpful for organizing our observations. We look for the behaviors that are used to initiate, respond to, maintain, or terminate social interactions, as well as the use of gaze and the expression of affect in social interactions.

The observational framework shown in Table 24.3 was not designed to quantify the behaviors involved. Instead, it provides detailed descriptions of response topographies and related contextual variables, which will help to pinpoint productive intervention contexts.

Language-Related Cognitive Abilities/Symbolic Representation

Assessment of cognitive strengths and weaknesses is of extreme relevance, particularly for individuals at preverbal levels. It is important to determine an individual's understanding of characteristics and categorizations of objects, events, and persons, and how such understanding is brought into his or her social interactions. Therefore, communication abilities should be considered in the context of cognitive abilities, including attentional capacities, symbolic play and object use, and understanding of cause–effect relations (Bates, 1979). Both cognitive and social skills are pertinent to the emergence of symbolic play, and distinct correspondences have been observed in the appearances of increasingly sophisticated forms of language and play (McCune, 1995; McCune-Nicolich, 1981).

Persons with autism and PDD have been found to have relative weaknesses in symbolic play (make-believe play in which one object is used to stand for and represent an absent object), presumably because of the greater social demands of symbolic play (Dawson & Adams, 1984; Sigman & Ungerer, 1984; Wetherby & Prutting, 1984; Wing & Gould, 1979), and in symbolic representational capacities (Frith, 1989). Relative strengths are observed in constructive play (combining objects to create a product such as a drawing, a block construction, or a puzzle assembly; Schuler, 1995). For children with autism and PDD, it is important to assess play skills at preschool and early school age, and to compare their cognitive level of symbolic play separate from their constructive play. Because participation in symbolic play diminishes during late childhood, it is not appropriate to evaluate symbolic play in adolescents and adults with autism and PDD, even if they have cognitive limitations. It is possible to assess knowledge of object use and level of sequential organization in daily living skills (e.g., setting the table and doing laundry) and in recreation and leisure skills, to provide information about nonverbal mental representation. Extreme insistence on identical routines is generally suggestive of limited symbolization, and spontaneous manipulations of "novel" objects may provide another index of levels of representation.

It is our position that the cognitive status of individuals should never dictate teaching content, and that cognitive objectives that are removed from a context of functional communicative exchanges are undesirable. On the other hand, neglect of cognitive abilities and styles may backfire, because only situation-specific communicative behaviors may be learned when content is developmentally inappropriate. Such communicative acts are not likely to generalize or be used spontaneously in interactive contexts. Therefore, we believe that assessment of cognitive levels is of critical importance in planning intervention when assessing persons at prelanguage levels (see Table 24.4; also see Chapter 19).

Assessment Practices and Strategies

For persons at preverbal levels, assessments that depend solely on verbal instructions or verbal output are not suitable. In addition, the characteristics of preverbal individuals make assessments that depend on modeling or imitation questionable. Familiarity with typical profiles of persons with autism and PDD often allows slight modification of the tasks and protocols, to obtain the information sought. It should be kept in mind, however, that such adaptations make the findings more difficult to interpret. Congruent with the cognitive profile and the associated learning style, as discussed earlier, we find that tasks that are visual and that involve a spatial layout of the information presented are most manageable.

TABLE 24.3 Social Interaction Observation Guide

Name: _____

Observer: _____

Length of Observation: _____

Context: _____ Date: _____

INITIATION SKILLS (e.g., Approaches, Touches, Offers Object, Gestures, Vocalizes, Signs/Speaks, Other)

Description/Context:

RESPONDING SKILLS (e.g., Reorients Toward, Imitates, Complies with Directives, Gestures, Vocalizes, Signs/Speaks, Other)

Description/Context:

MAINTENANCE SKILLS (e.g., Maintains Proximity, Follows, Imitates, Alternates or Reciprocates Action, Takes Turns, Offers Objects, Vocalizes, Signs/Speaks, Other)

Description/Context:

TERMINATION SKILLS (e.g., Moves Away, Gestures, Signs/Speaks, Other)

Description/Context:

LEVEL OF PLAY (e.g., Unoccupied, Isolate, Onlooker, Parallel, Associative, Cooperative)

Description/Context:

TABLE 24.4 Major Questions for an Interview to Assess Cognitive Status

1. Does the individual realize that objects and/or people continue to exist even when out of sight? (Objective and people permanence)
2. Does the individual realize and anticipate the impact of his or her own and other people's actions?
3. Does the individual understand that different looking objects can belong in the same conceptual category/class because of shared features?
4. Does the individual remember and utilize concrete spatial information (e.g., location, shape, etc.)? Does the individual remember and utilize less tangible, fleeting information (e.g., facial expressions and gestures)?
5. Does the individual insist on the strict maintenance of routines/rituals, or can creative rearrangements of events be tolerated?
6. Does the individual demonstrate object manipulations that are largely stereotyped and/or exploratory, or, instead, functional and pretend forms of object manipulations?
7. Does the individual imitate novel actions vs. actions already observed within his or her behavioral repertoire?

Assessment of activities that require relatively simple motor responses is important because our own clinical experience is consistent with literature claiming the existence of additional motor planning problems (e.g., Biklen, 1990; Grandin, 1995b), including oral and limb apraxias that negatively impact on motor planning, coordination, and execution.

The difficulties inherent in assessment mandate validating assessment findings through other sources. The use of multiple types of assessments carried out in multiple contexts serves to reduce the chances of situational artifacts and measurement error. Such variation in assessment formats and contexts has additional value in a dynamic sense: it may serve to identify optimal learning contexts and supports. It is also important to look at the effects of externally imposed structure. Assessment formats that are highly externally structured may present a very different clinical picture than more loosely structured formats, which require individuals to impose their own structure, that is, to regulate and organize their own behavior. (For an in-depth discussion of this issue, see Schuler & Perez, 1991.)

Because of the difficulty in assessing language, communicative, social, and related symbolic abilities of individuals with autism, we recommend use of a combination of assessment strategies (Peck & Schuler, 1987; Wetherby & Prizant, 1992b), varying from direct observations of naturally occurring behavior samples throughout the day to ratings of behaviors observed in semistructured or staged communicative contexts. If possible, such situations should be videotaped for later analysis. Assessment of these abilities should occur in the home, the classroom, and the community, and should involve significant others in order to determine what abilities an individual can and will need to use in his or her natural environments.

Interviews

An initial method for gathering information about an individual's communicative and symbolic behavior is to interview significant others. Because of their extensive experience under a range of circumstances, the input of family members and teachers is critical in providing a highly representative picture of an individual's communicative repertoire and profile. For these reasons, we have made extensive use of structured interview formats to assess communicative competence (Schuler, 1981, 1985; Schuler et al., 1989; Wetherby & Prizant, 1993b). The completion of an interview sets the stage for close collaboration among parents, other caretakers, and pertinent professionals. Because the knowledge of many valued informants tends to be intuitive and not formalized, we have found it helpful to operationalize the questions and avoid any queries that are too open-ended. Table 24.5 displays the questions used; together with the means presented in Table 24.2, they constitute the core of our interview format.

The process of completing an interview has, in our experience, been most valuable because informants become typically more cognizant of their interaction and communication patterns when they respond to the questions posed. This type of awareness is most critical to effective incidental teaching in naturalistic contexts.

Naturalistic Observation

A second assessment strategy is observation during performance of routine activities, using a checklist or inventory of possible

TABLE 24.5 Overview of Probed Communicative Functions and Corresponding Situational Contexts

Requests for Affection and Interaction	Requests for Adult Action
What if S. wants:	*What if S. wants:*
An adult to sit close?	Help with dressing?
A peer to sit near adult to pay attention?	To have a book ready?
A cuddle or hug?	An adult to perform a favorite action/activity?
To sit on an adult's lap?	An adult to look in a certain direction?
To be closer to peers?	An adult to move or remove himself or herself?
To interact with peers?	An adult to play a record or sing a song?
To play ball or another game with an adult or peer?	Other?
Other?	

Requests for Food, Toys, or Other Items	Protests (Reversed Requests)
What if S. wants:	*What if:*
An object (toy) out of reach?	A common routine is dropped or changed?
A door/container opened to get something?	A favorite food is removed?
A favorite food or drink?	A favorite toy is removed?
Keys, books, or other toys that are out of sight?	S. is taken out for a ride when he/she doesn't want to go?
Other?	Other?

Declaratives/Comments
What if S. wants:
To show an adult a favorite toy?
To look at what he or she is doing?
To direct an adult's attention to something that is happening or has happened?
Other?

Note: These questions are asked in conjunction with the summary of communicative means.

communicative and symbolic behaviors. Observation during regularly scheduled activities provides information about an individual's communicative, social, and symbolic behavior, as well as the adequacy of the natural environment to provide opportunities that foster spontaneous communication. For children, peer play contexts provide ideal opportunities to obtain measures of communication, social interaction, and object use. Table 24.6 provides an example of the framework we have used in our own research and demonstration activities (Wolfberg & Schuler, 1993).

Observations in natural contexts provide meaningful information about an individual's spontaneous communicative behavior; however, collecting this information may be very time-consuming. Furthermore, because an individual may not display particular behaviors during even an extended observation period, semistructured assessments of communicative behavior, which we refer to as *communication behavior sampling*, are an important adjunct to interviewing and naturalistic observation.

Communication Behavior Sampling

Measures of communicative behavior in staged communicative situations or during "communicative temptations" are obtained by creating situations that necessitate some communicative response, such as putting desired objects out of reach, or placing a favorite toy or piece of candy in a "see-through" container that is tightly closed. These procedures are similar to those described by Curcio (1978), Peck and Schuler (1987), Sugarman (1984), and Wetherby and Prizant (1993b). The purpose is to create a situation that is highly enticing to an individual, while requiring some active signaling directed toward the partner. Once the individual anticipates that the communicative partner may act in a predictable way (e.g., by opening the container, by rolling back a ball, or by blowing more bubbles), the situation be-

TABLE 24.6 Definitions of Dimensions of Cognitive and Social Play

Cognitive Play with Objects	Social Play with Peers
No Interaction The child does not touch or play with toys. The child engages in self-stimulatory behavior that does not involve toys (e.g., the child stares at hands; rocks body; waves or flaps arms or hands; stares at toys).	*Isolation* Child appears to be oblivious or unaware of others. May occupy self by watching anything of momentary interest, playing with own body, or playing alone (e.g., child wanders, gets on and off chair, sits quietly, plays with back to peers).
Manipulation Exploratory play with toys ranges from simple to quite complex interactions. There is an apparent motivation to control the physical world. Child shows an interest in toys, but does not use them in conventional ways (e.g., holds and gazes at toys; mouths, waves, shakes, or bangs toys; stacks blocks or bangs them together; lines up objects).	*Orientation* Child has an awareness of the other children, as evidenced by looking at them or at their play materials or activities. The child does not enter into play (e.g., child quietly watches other children, child turns whole body facing children).
Functional Complex and conventional use of toys in which one response is definitely dependent on another. There is a quality of delayed imitation while actions are performed that include simple pretense (e.g., puts teacup to mouth; puts brush to hair; connects train sections and pushes train; arranges pieces of furniture in dollhouse; constructs a building with blocks).	*Parallel Location/Proximity* Child plays independently, beside rather than with the other children. There is simultaneous use of the same play space or materials as peers. There may be occasional imitation, showing of objects, or alternation of actions with peers (e.g., one child plays with a ball while sitting close to another child who plays with a train; one child brushes a doll's hair while another pushes a doll in a carriage).
Symbolic/Pretend The child pretends to do something or to be someone or something else, with an intent that is representational. Mature pretense involves role playing and includes movements, vocalizations, or verbalizations that are substituted for real objects (e.g., child makes hand move to mouth, signifying drinking from teacup; makes a puppet talk; uses a toy person or doll to represent self; uses block as a car accompanied by engine sounds).	*Common Focus* Child engages in activities directly involving one or more peers, including: informal turn-taking, giving and receiving assistance and directives, and active sharing of materials. There is a common focus or attention on the play (e.g., each child plays with blocks and shares blocks, each plays with dolls and touches others' dolls; they take turns playing beanbag toss).

gins to make sense (Donaldson, 1978; Duchan, 1986). The partner then violates the interactional "contract," probing to determine what the individual will do to fix or repair the interaction. For instance, the individual may reach over and move the partner's hand toward the container. This would be recorded as a "reenactment" strategy or a physical manipulation. Alternatively, the individual might point to the jar, sign "eat," vocalize, passively gaze at the adult, actively gaze back and forth between the jar and the adult, or engage in context-appropriate or marginally related stereotyped and/or echolalic speech. On the other hand, minimal active signaling may be observed. The individual may keep trying to open the container, shake it, or mouth it; he or she may even seem to forget about the contents. In addition, agitation or some form of challenging behavior, such as self-injury, tantrums, or aggression, may be observed. Table 24.6 summarizes actual behaviors that have been observed in such contexts. It may be helpful to use a standard protocol that specifies the behaviors observed across repeated trials, allowing examination of behavior gains over time. (For a more detailed description of this assessment approach, see Peck et al., 1983; Sugarman, 1984; Wetherby & Prizant, 1993b.)

Assessment should be considered an exploratory process and should be ongoing, particularly when assessing unconventional and

primitive communicative behaviors. Assessment using a combination of interviewing, observing, and sampling provides information about an individual's profile of strengths and weaknesses in language, communication, social relatedness, and symbolic capacity, as well as information about the interaction style of significant others and the adequacy of natural environments to provide opportunities for communicating. Such assessment information provides the basis for decisions about intervention goals and strategies.

Communication and Symbolic Behavior Scales

To accomplish the assessment goals discussed above, and to provide an alternative to currently available formal assessment tools for developmentally young children, we developed the Communication and Symbolic Behavior Scales (CSBS) (Wetherby & Prizant, 1993a) to formalize a more authentic, yet efficient approach to assessment. The CSBS is designed to examine communicative, social/affective, and symbolic abilities of individuals whose functional communication abilities range from emerging prelinguistic intentional communication to early stages of language acquisition. This assessment instrument is designed to meet the goals of the diagnostic assesment as well as assessment for purposes of intervention planning. A developmental screening version of the CSBS is forthcoming.

The CSBS utilizes a standard but flexible format for gathering data, using a combination of a caregiver questionnaire and behavior sampling procedures. Through the use of a questionnaire that can be given to the family ahead of time or on the same day as the direct assessment, information is gathered from the caregiver about the individual's communicative and symbolic competence, using descriptive questions that solicit examples of typical behaviors. The direct assessment involves varying degrees of relatively structured and unstructured sampling procedures that resemble natural interactions and provide opportunities for documenting an individual's use of a variety of communicative and symbolic behaviors. The CSBS sampling procedures allow for dynamic assessment of the effects of contextual factors on an individual's communicative abilities. Examples of how dynamic assessment is integrated within the CSBS sampling procedures include: (a) comparisons of the individual's communication during structured communicative opportunities as opposed to unstructured play contexts within the sample; (b) when the individual's communicative attempts are not responded to as intended, opportunities to examine the individual's ability to persist and repair are created; and (c) if the individual does not initiate communication during structured opportunities, a hierarchy of verbal and gestural cues is offered, and the individual's response to these cues can be examined.

The caregiver is present during the entire sampling and is encouraged to respond naturally to the individual's bids for interaction. After the sample is collected, the caregiver rates how typical the individual's behavior was during the sample, along seven dimensions: (a) alertness, (b) emotional reaction, (c) level of interest and attention, (d) comfort level, (e) level of activity, (f) overall level of communication, and (g) play behavior. The caregiver's perception rating allows the caregiver to validate the representativeness of the individual's behavior during direct assessment. Thus, the assessment procedures enable the clinician to engage the parent as an interactant during the direct assessment with the individual and as an informant by using the caregiver questionnaire and the caregiver perception rating. Having the caregiver present as a participant during the sampling provides an opportunity for the clinician and caregiver to build consensus on perceptions of the individual's communicative strengths and weaknesses, as displayed during the sample, and to compare these patterns with information provided on the caregiver questionnaire.

Behaviors collected in the sample are rated along a number of parameters and are converted to scores on 22 5-point rating scales of communication and symbolic behaviors. Seven cluster scores are derived from the 22 scales: the first six contribute to the individual's profile of communication and the last one relates to the individual's profile of symbolic behaviors. The clusters are: Communicative Functions, Communicative Means—Gestural,

Communicative Means—Vocal, Communicative Means—Verbal, Reciprocity, Social-Affective Signaling, and Symbolic Behavior. Table 24.7 lists the scale clusters and individual scales used on the CSBS.

Normative data on a sample of almost 300 normally developing American English-speaking children from 8 to 24 months of age and 30 children with developmental disabilities from 18 to 30 months of age have been published (Wetherby & Prizant, 1993a). In addition to norms referenced to chronological age, the CSBS presents norms based on the following language stages: prelinguistic, early one-word, late one-word, and multiword.

Summarizing Assessment Data

By summarizing the assessment information gathered across the various domains, the interrelations between domains and the meaning of the emerging profiles will become clearer. Two similar, yet different, case illustrations may serve to clarify these points.

Mark is a 3-year-old who has not yet grasped the idea of intentional communication. His communicative signals include proximity and passive gaze, combined with posturing and stereotypic motor behaviors—highly rhythmic finger-tapping as well as occasional hand-biting when apparently frustrated and upset. So far, Mark doesn't seem able to regulate his own emotions. He depends on the structure provided by others to prevent and manage behavior escalations. No social initiation of any type is noted, but there is some responsiveness to initiations of others in routine contexts, such as a "peekaboo" routine initiated by his little sister. In those instances, Mark has been observed to smile and cover his sister's face with her hands in an apparent attempt to continue the routine. This is the only context in which notable positive social affect has been observed.

Regarding imitation, Mark will mimick the hand motions of others when they are imitating him. In more technical terms, Mark demonstrates emerging imitation skills within the constraints of his own repertoire of behaviors. Although the behaviors demonstrated are indicative of severe delays, his performance with objects in nonsocial domains is more advanced. As is common in autism, Mark is fascinated with objects and explores them actively. He has a pretty good notion of object permanence, as evidenced by his ability to remember the exact location of his favorite toys and preferred reinforcers at his school program. This object knowledge may not be readily apparent in a more formalized assessment context, because of his limited understanding of the physical impact of his own actions or the actions of others. For instance, he would not be able to retrieve a hidden object, as is often required in a more formal assessment context, because he would not understand that his own actions could serve to retrieve the item. Instead, he is more likely to demonstrate his knowledge of object location by hovering around a storage cabinet, climbing on it, or even unlocking it. Nevertheless, not knowing how to do so, he would never actively seek out the assistance of others to help him access his treasures.

Mark is able to match identical objects and has performed a variety of tasks that require visuospatial skill, as long as the tasks were presented nonverbally and laid out spatially. Although Mark demonstrates only functional and conventional object use in the context of routines (e.g., when making brownies with his mother at home), motorically sophisticated and unconventional, if not creative, forms of object use were observed in free play. However, when approached by peers, Mark generally tries to "escape"; the proximity of peers seems hard to tolerate. The greatest proximity to peers has been observed in the sandbox, one of Mark's favorite spots. In this location, he has occasionally demonstrated some parallel play, when a preschool peer was imitating his sand-sifting routine. In that context, Mark has been noted to cast an occasional glance at the other child.

In the speech domain, Mark has produced a few context-specific but only marginally intelligible vocalizations, which might have functioned like delayed echolalia. When his vocalizations are imitated, in an attempt to establish vocal turn-taking, he seems intrigued but, so far, has not reciprocated these "echoes." His speech comprehension appears extremely limited. Yet, because of his uncanny ability to recall routinized actions in response

TABLE 24.7 Assessment Clusters and Scales in the Communication and Symbolic Behavior Scales (Wetherby & Prizant, 1993)

I. Communicative Functions

1. *Behavioral Regulation.* Communicative acts used to regulate behavior of another person to obtain or restrict an environmental goal.
2. *Joint Attention.* Communicative acts used to direct another's attention to an object, an event, or a topic of a communicative act.
3. *Sociability of Functions.* Proportion of communicative acts used for social interaction plus joint attention.

II. Communicative Means—Gestural

4. *Conventional Gestures.* Gestural communicative acts whose meaning is shared by a general community, including giving, showing, pushing away, open-hand reaching, pointing, waving, nodding head, and shaking head.
5. *Distal Gestures.* Gestural communicative acts in which the child's hand does not touch a person or object (e.g., open-hand reaching, pointing at a distance, waving).
6. *Coordination of Gesture and Vocal Acts.* Communicative acts that are composed of a gesture and a vocalization produced simultaneously or overlapping in time.

III. Communicative Means—Vocal

7. *Vocal Acts without Gestures.* Transcribable vowels or vowel-plus-consonant combinations that are used as a communicative act and are not accompanied by a gesture.
8. *Inventory of Different Consonants.* The total number of different consonants produced as part of communicative acts.
9. *Syllables with Consonants.* Vocal communicative acts that are transcribable vowel-plus-consonant combinations.
10. *Multisyllables.* Vocal communicative acts that contain two or more syllables that may be vowels only, or a vowel plus a consonant.

IV. Communicative Means—Verbal

11. *Inventory of Different Words.* The total number of different words used (i.e., spoken or signed) in communicative acts; a word or word approximation must be used to refer to a specific object, action, or attribute and only to that word class.
12. *Inventory of Different Word Combinations.* The total number of different multiword combinations produced in communicative acts.

V. Reciprocity

13. *Respondent Acts.* Communicative acts that are in response to the adult's conventional gestures or speech.
14. *Rate.* The frequency of communicative acts displayed per minute.
15. *Repair Strategies.* A measure of the child's ability to repeat and/or modify a previous communicative act when a goal is not achieved.

VI. Social-Affective Signaling

16. *Gaze Shifts.* Alternating eye gaze between a person and an object (i.e., either person-object-person or object-person-object).
17. *Shared Positive Affect.* Clear facial expressions of pleasure or excitement, accompanied or unaccompanied by a vocalization, that are directed toward the adult with eye gaze.
18. *Episodes of Negative Affect.* Clear vocal expressions of distress or frustration that commence when the vocalization begins and continue until the child has recovered and has displayed a neutral or positive affect.

VII. Symbolic Behavior

19. *Language Comprehension.* A measure of comprehension of contextual cues, single words, and multiword utterances.
20. *Inventory of Different Action Schemes.* The total number of different action schemes used with objects in symbolic play.
21. *Complexity of Action Schemes.* A measure of the child's use of action schemes with objects, toward self or other agents, and the child's ability to sequence different action schemes in pretend play.
22. *Constructive Play.* A measure of the child's ability to use objects in combination to construct a product (e.g., a tower).

to specific situational cues, his abilities in this domain are often overestimated by others.

David, a 10-year-old, demonstrates a similar profile but functions overall at a somewhat higher level. David exhibits more intentional forms of communication, indicating an emerging understanding of means–end and causality relationships, but almost no understanding of social agency. His reenactment strategies are used deliberately in anticipation of a desired outcome, but he does not realize how the actions of others contribute to the outcome. For instance, David communicates his desire to be taken out to the shopping center by physically pulling his dad toward the door, and by piling up his father's car keys and coat in the entrance hall. David is highly attached to routines and becomes quite agitated when his routines are disrupted. His receptive skills are a bit higher than Mark's, but, again, they tend to be overestimated because of David's ability to pick up on extraneous cues.

As for David's speech and language skills, he produces some stereotyped speech (delayed echolalia) and signs within the context of predictable routines, and more intentional forms of communication in concrete contexts related to objects and physical events (e.g., to request food). In other contexts, more primitive signaling occurs. David initiates social interaction by seating himself next to a favorite person and then climbing on the person's lap and physically moving his or her face in his direction.

Within the cognitive domain, David is able to perform rather sophisticated categorization and matching tasks, as long as only judgment with regard to physical properties (not the functional use of the object) is concerned. For instance, although able to match broken and whole objects as well as objects that complement each other, such as the bottom and the top of a jar, he is unable to match a crayon and a pen on the basis of their shared writing functions. He demonstrates a number of functional object manipulations, such as "driving" toy cars and making airplanes fly. He will also make a brushing motion when presented with a hairbrush and a sucking motion when presented with a baby bottle (he has a baby sister at home). However, he does not demonstrate any pretend actions. Regarding the social dimensions of his play, he tolerates the close proximity of other children in the play area and has demonstrated some parallel play, as well as turn-taking, when toy cars are involved. In that same context, he has been observed to share a common focus (a toy parking garage) with a neighborhood "friend" who frequently visits his house. He and his friend take turns moving cars down the ramp. In these contexts, David smiles and appears content. Negative affect is demonstrated when confronted with violations of routine, or when other children interfere with his rather rigid play routines. He has not yet learned to regulate his emotional state but has been noted to engage in delayed echolalic vocalizations such as "Be OK, be OK," indicative of potential emotional regulation through self-talk.

From Assessment to Intervention

Once a profile of an individual's strengths and weaknesses in communication and related areas is determined, goals and strategies for communication enhancement may be considered. As discussed in Chapter 23, developmental and functional considerations need to be integrated, and professionals and caregivers should collaborate in this process. Assessment serves to determine initial goals and strategies that can be modified and refined over time, based on the success of communication enhancement efforts and the specific changes in an individual's communication profile. The profile serves to select and fine-tune instructional goals and objectives. For instance, the overall communication objectives for Mark and David will be rather similar, but individual adaptations will have to be made with regard to the level and type of task presentation, the degrees to which contexts need to be staged and/or routinized, and the interaction styles to be adopted.

COMMUNICATION ENHANCEMENT AT PRELINGUISTIC LEVELS

In Chapter 23, we reviewed our basic philosophy of intervention for individuals at both prelinguistic and language levels. This chapter focuses more specifically on goals and communication enhancement strategies at

prelinguistic levels, with concentration on communicative means and functions. Goals for other communication-related domains are suggested in a more cursory form. No strict sequence of goals is implied; some may be approached simultaneously. However, the goals in this section are organized, in general, from less to more sophisticated dimensions of communication and social reciprocity.

Establish Anticipatory and Early Intentional Behaviors

In working with individuals who communicate at a preintentional level, it is essential that communication enhancement efforts take place in contexts of predictable routines—everyday living routines, as well as contrived activities engineered to support the development of communication skills. The focus of initial intervention should be the establishment of (a) anticipatory behaviors, indicating that the individuals involved are starting to make predictions about sequences of activities and events, and (b) communicative behaviors, which are necessary to reach desired goals during such events. The persons learning to communicate must become cognizant of the effects of their own as well as other people's actions. Typically developing infants learn to do so in the context of highly repetitive interactive routines, such as those commonly encountered in feeding and bathing (Bruner, 1981). The anticipation of highly predictable behavior sequences sets the stage for intentional communication. When the routines involved are slowed down or otherwise violated, an individual may be prompted to continue the routine by vocalizing, or by body movements, which are responded to as if they are intentional signals, serving to restore the anticipated sequence of behavior.

For individuals with the most severe communicative limitations, as described above in the case of Mark, anticipation of communicative outcomes should be established in a highly routinized format. The initial goal is not to request independently (e.g., a piece of food), but rather to attend closely to the concomitant interaction sequences, which eventually lead to the desired outcome or reinforcing event. For instance, a banana is sliced up in a tantalizing way in front of a child like Mark, who is fond of bananas. These slices are offered one at a time, in a highly ritualized and dramatic way, to ensure that Mark's attention is indeed captured. Initially, the banana is offered with no strings attached; the only goal is for Mark to start anticipating the routinized transactions—by leaning forward, extending the palm of his hand, making eye contact, and so on. When some anticipation of the interactive routine is evidenced, Mark will be required to respond more actively. Increasing time delays will be introduced before the next slice of banana is offered. These delays give an opportunity to watch for any initiations and/or agitation from Mark. To restate this more formally, the violation of the established routine now becomes a context for incidental assessment as well as incidental teaching. Based on what is observed in the staged assessment context, a more active response is now required: a pointing motion in the direction of, or a mere touch of, the banana; an extended hand; an active gaze shift from the banana to, or in the direction of, the adult's face; and/or a vocalization or head movement. Simple communicative gestures that are readily initiated and can easily be used across contexts, such as reaching motions or physical manipulations, are more suitable for establishing early intentional communicative acts than more formalized communication systems, such as communication boards and booklets, which are not always immediately accessible.

An alternative to the establishment of routines for the sake of communication enhancement is the use of already existing instructional routines. When the anticipated routine sequence of events is interrupted, the motivation to complete the established routines may mobilize communicative initiative (Halle, 1984; Prizant, 1982). Motivating contexts may readily be identified through collaboration of caregivers, teachers, speech and language specialists, and others involved with the individual. What is being stressed in dealing with minimally communicative individuals is the need to communicate more actively through *any* means (preferably, more conventional and socially appropriate means), and to establish increasingly intentional forms of communication.

Replace Idiosyncratic Communicative Means

Reenactments and other idiosyncratic means of communicating need to be replaced by more conventional and intentional gestures, such as an extended hand or a pointing gesture. Replacement of idiosyncratic patterns of communication by more appropriate means warrants some closer discussion. For instance, if challenging or otherwise socially unacceptable behavior serves to secure attention or to protest, the individual may be taught, for instance, how to secure physical contact by asking or signing for a hug, or may learn to communicate "no" or "stop" when an undesirable item is being presented (e.g., a push-away gesture). Although short-term behavioral interventions may need to zero in on the elimination of a possibly harm-inflicting behavior, longer-term teaching efforts should be tailored toward the establishment of more appropriate communicative alternatives. (For detailed discussions and examples, see Carr et al., 1994; Durand, 1990; Reichle & Wacker, 1993.)

Depending on the intensity of the behavior, the state of arousal associated with it, and the availability of clearly observable antecedent cues, behavior reduction efforts may be directly combined with communication skill-building efforts. For instance, jumping and flapping may be replaced by pointing and looking in the direction of the desired item, when a favorite toy or food is being requested. If the behavior is relatively harmless, behavior replacement strategies are readily used in incidental contexts. Carr et al. (1994) and Durand (1990) have provided numerous examples of such behavior intervention strategies, referring to them as "differential reinforcement of communicative behavior." If the behavior of concern is more severe and/or dangerous, replacement strategies may only work when antecedents can be detected in time to divert the undesirable behavior by helping an individual to communicate more appropriately, or to calm down. If this is not the case, more conventional behavior management strategies may be combined with the teaching of relevant communicative behaviors in more manageable contexts.

When assessment results indicate, as in the case of David, a reliance on reenactment behaviors, use of conventional gestures may be targeted. This route can be pursued by frequent modeling of, for example, pointing and showing gestures, and the accompanying gaze and body orientation in suitable activities. Physical prompts and ritual violations (as described above) may be used when modeling does not suffice. Yet, it is important that the individuals involved start to observe others' use of gestures and to experience the immediate success of their own use of communicative gestures. Activities and strategies that may help to foster use of conventional gestures have been described by Willard and Schuler (1987). Examples include: (a) give-and-take exchanges; (b) commenting on and pointing at pictures and objects; (c) offering desirable and undesirable foods or toys to elicit gestural or vocal requests, or push-away gestures, head shakes, or head nods; and (d) modeling and prompting a hand wave for greeting when a person enters a room, or for farewell when a person leaves or favorite activity objects are put away.

The use of natural gestures, such as body orientation, pointing, and gaze to direct the behavior of others, should be emphasized for David. His reliance on reenactment strategies is indicative of his limitations in understanding social agency. Pointing and gaze can be added through incidental teaching in suitable contexts, but the introduction of a spatially organized communication board or booklet, or a simple set of pictures (see later discussion), may provide an extra incentive. Such salient referents can promote highly concrete pointing and gaze behaviors.

Establish Multiple Means of Communication

The development of conventional vocalizations—the addition of vocalizations to nonvocal means—requires clear, if not, emphatic, modeling of both words and intonation patterns during communicative exchanges. Although it is not expected that all individuals will clearly imitate and acquire a wide variety of conventional forms of words at this stage,

imitation of sounds and approximations of words in highly repetitive routines can be encouraged. As with gestures, partners need to provide clearly visible models by being at an individual's physical level, encouraging (not coercing) face-to-face gaze, and producing words slowly, clearly, and repetitively in communicative exchanges. In doing so, specific speech imitation training may be useful. A number of different strategies may be used; selection should be based on an individual's chronological age and learning style. Strategies that may heighten an individual's attention to speech and foster vocal imitation and approximation include:

1. Imitating an individual's vocalizations and gradually modifying them in a playful turn-taking context.
2. Using short, relevant phrases and introducing interesting and simple intonation patterns.
3. Using stereotypic or ritualized utterances in routines (e.g., saying "What's *that?*" with exaggerated intonation while looking at pictures in a book, "Uh-oh" when something falls down, "All finished" when completing an activity).
4. Modeling short utterances, in synchrony with body movement, during gross motor and physical games, or sensory integration activities.
5. Singing songs and/or reciting rhymes that have predictable slots for words or sounds to be filled in.

With appropriate modeling and opportunities to vocalize and imitate, most individuals at this level, if they have the requisite oral-motor skills, should begin to produce varied and frequent vocalizations, with increased imitation and/or approximation of adult models within highly routinized contexts. Highly limited or restricted vocal production, in the presence of clear intentional gestural communication, may be indicative of motor speech problems. An in-depth consideration of oral-motor function, and immediate consideration of a more formal augmentative communication system (discussed in a later section), would then be required.

Expand the Range of Communicative Functions

As noted earlier, one important aspect of communicative competence is the range of purposes or functions for which an individual communicates (Prizant & Wetherby, 1990). Individuals with autism and PDD have been found to communicate for a relatively narrow range of functions or purposes (i.e., primarily for behavioral regulation). When individuals communicate for fewer purposes and these purposes serve relatively nonsocial functions, fewer opportunities to engage others in social interaction are created, resulting in fewer opportunities to learn about the reciprocal nature of communication. For example, an individual may communicate primarily to request or protest to satisfy immediate physical needs. Typically, this individual will have difficulty bringing attention to self to request social games or comfort from others, or to bring attention to events for the purpose of sharing those experiences with others. The transactional impact of such a limited range of functions is that communicative partners have few opportunities to model a broader range of communicative behaviors and/or expand on communicative initiations exhibited. Therefore, an important goal for individuals at a prelinguistic intentional communicative level is expansion of the range of functions.

Communication for a wider variety of purposes provides a special challenge to communicative partners, who must create needs and opportunities, provide intensive modeling, and, if necessary, prompt conventional prelinguistic gestures and salient language models. The functional breakdown of communicative acts for (a) behavioral regulation, (b) social interaction, and (c) joint attention (Bruner, 1981; Wetherby & Prizant, 1993b) is useful in setting specific goals because it helps to delineate the least social (behavioral regulation) from the most social forms of communication (joint attention). Some types of activities provide opportunities to elicit and model communicative acts across all categories. Final activity selections must be made according to their chronological and developmental appropriateness for individuals at prelinguistic and

at early language levels. Based on an individual's motivations, needs, and learning strengths (see Table 24.8), additional activities may be included.

The desire to establish an interest in joint attention and action underscores the need to include families, siblings, and peers, and it calls particular attention to the importance of play. Play is the ultimate context for joint as well as reciprocal action, as best demonstrated by common play scenarios. For instance, two children may be gazing at a block tower that they are constructing together. By taking turns in stacking blocks, they jointly create suspense as they watch the tower getting so tall that it might collapse. The joint attention culminates when the tower does indeed collapse. The children share their excitement by looking at each other and at the collapsed tower. Common play scenarios of tea parties and grocery shopping are hard to imagine without joint attention and action.

TABLE 24.8 Activities to Expand Communicative Functions

Characteristics of Activities for Behavioral Regulation

1. Opportunities to request food or objects.
2. Opportunities to make choices among alternatives.
3. Opportunities to protest actions or to reject objects or food.
4. Opportunities to request cessation of an activity.
5. Opportunities or needs to request assistance.

Characteristics of Activities for Social Interaction

1. Opportunities to request social games or routines, or continuation of games or routines.
2. Opportunities to practice greeting behaviors verbally or nonverbally.
3. Opportunities or needs to bring attention to self through calling others or requesting comfort verbally or nonverbally.
4. Opportunities to "show off" during games (e.g., hide-and-seek, peekaboo, dressing up, face painting, show and tell).

Characteristics of Activities for Joint Attention

1. Opportunities or needs to give or transfer objects, or to follow another person's focus of attention.
2. Opportunities or needs to use gestures or vocalizations to bring attention to objects or events (e.g., looking at books, going to the zoo, looking out a window onto a busy street).
3. Opportunities to comment on events introducing novelty and change (e.g., taking new toys out of a cloth bag, performing interesting actions on objects).
4. Opportunities or needs to request information or clarification (for children with higher-level abilities).

Our experiences with play have been very encouraging; besides advances in play, we have observed the most positive changes in communicative behaviors that were not specifically being targeted for intervention. Initially, we were quite skeptical about our chances to enhance play in school-age children who lacked both the social and cognitive dimensions of play. We were most encouraged by the gains in play behavior that we were able to document (Wolfberg & Schuler, 1993), and we believe that these gains were accompanied by gains in the social dimensions of communication because play offers a natural context for joint attention and joint action.

The subjects of our case illustrations, Mark and David, need to learn to play. The approaches prescribed will be very similar; we do not advocate a strictly developmental approach. We believe that children should be immersed in play through the peer and contextual support provided. Nevertheless, individual adaptations are based on our overall observations and on the assessment findings. In the case of David, we are faced with a relatively rich play repertoire, including functional rather than self-stimulatory object manipulations, and an emerging play scenario involving toy cars and a garage as well as toy airplanes. These play routines are still rather repetitive, but David's tolerance of peers allows him to acquire a more diverse repertoire, including emerging pretense and related story schemes. To promote that kind of narrative understanding and emerging "theory of mind" (Frith, 1989), support needs to be provided through peer coaching, modeling, and the selection of suitable play props and settings.

Mark's relative lack of play provides more challenges, although they are offset a bit by his age. We have found interactions with younger peers often helpful, since so many of the younger kids are prone to the type of physical rather than verbal play and/or highly rule-bound play that we typically find in older

children. Nevertheless, even play with younger peers still needs to be supported—for example, by selecting an optimal physical space and suitable toys and activities, and by carefully choosing (and limiting) the number of peers involved. Based on the assessment findings, we might suggest a sandbox setting for Mark and provide him with a variety of containers and a modeling of sand play scenarios to the peer(s) selected. Parallel play and turntaking would be targeted here, but attempts would be made to frame Mark's still stereotypic actions into a larger peer play scenario. (For further suggestions, see Wolfberg, 1995, and also Sheridan, Foley, & Radlinsky, 1995.)

Develop Strategies to Persist in Communication and to Repair Breakdowns

Many factors may interfere with an individual's ability to communicate intentions successfully; for example, environmental distractions, inability to secure a partner's attention, or production of unclear or unconventional communicative signals (e.g., unintelligible speech, idiosyncratic gestures) may undermine communicative effectiveness. Therefore, a goal for prelinguistic individuals is the development of repair strategies, or an ability to persist, through repeating or modifying communicative signals, when initial communication is unsuccessful. An individual who demonstrates limited repair strategies may not realize his or her communicative potential even though the basic requisite communicative skills are present. Often, such individuals may appear passive, lethargic, or easily distracted. Once again, intervention strategies to develop the motivation to persist, and to repair communicative breakdowns, are predicated on frequent opportunities to do so in the presence of sufficient contextual, instructional, and interactive support, which puts more demands on the communication partner. These opportunities may occur naturally, but an extra effort should be made by partners who, by pretending not to understand, create opportunities for supported repair efforts.

It is important for individuals to clearly demonstrate intentional goal-directed communication before working on repair strategies. The underlying assumption is that intentional communication is already established, and persistence in communicating is the next major challenge. Individuals at emerging intentional levels should be responded to immediately, even if intent is assigned or imputed. Suggestions for developing repair strategies for both prelinguistic individuals and individuals in early language stages include:

1. Utilize preferred and highly motivating activities that are likely to keep an individual interested and focused.
2. Begin to require an increase in clear and conventional signals before responding to or imputing intent to unclear or subtle signals. However, acknowledge verbally or nonverbally that the individual has made an attempt to communicate. Respond with "What?" or "I don't understand," along with a questioning look, shrugged shoulders, and so on.
3. If the attempts to elicit a repair do not work, say "Show me" (and extend a hand) or "Say it again," whichever is appropriate to an individual's communicative level. If the unsuccessful communicative act involves requesting an object, the object may be presented again, and a simple reach may be followed by modeling or prompting an appropriate communicative act.
4. Partners' requests for repair should never be demanding, withholding, or negatively cast through disapproving facial expression or tone of voice, because some individuals will withdraw under such conditions. Any initial attempt at persistence should be supported by subsequent physical prompting of more appropriate gestures or clear modeling of speech at or slightly above an individual's expressive level.
5. Opportunities for repair may be set up by:
   a. Delaying responses to initial unclear communicative attempts.
   b. Intentionally responding incorrectly in a playful manner (e.g., heading toward the bathroom when an individual signals a wish for a drink at the water fountain).
   c. Offering undesired foods or items when an individual points or reaches in the direction of many items that are out of reach on a table or shelf.

At higher levels of repair, an individual may be required to first get attention (e.g., by tapping an arm or calling a name) prior to receiving a response.

Use Aided, Augmentative, and/or Alternative Communication (AAC)

It is beyond the scope of this chapter to provide a comprehensive discussion of the variety of augmentative or alternative communication (AAC) systems and instructional strategies available for persons with autism and PDD. AAC technology has proliferated over the past decade, especially for persons with more severe disabilities and communicative limitations (see Beukelman & Mirenda, 1992; Reichle et al., 1991; and Watson, Lord, Schaeffer, & Schopler, 1989; for more specific information). While opinions and practices do diverge, it is becoming increasingly clear that the selection of a suitable formal communication system is most critical when an individual: (a) is clearly communicating intentionally, possibly using multiple prelinguistic unconventional communicative means to express different functions; (b) uses communicative repair, pursing communicative alternatives when goals are not met; and (c) demonstrates the ability to understand some degree of representation (e.g., photographs or picture symbols), either through trial teaching or less formal exposure in daily routines. We are not implying that individuals must meet these requirements before an AAC system can be introduced; rather, persons demonstrating these abilities are likely to benefit greatly from the introduction of some type of system. For individuals with more significant limitations (e.g., no recognition of representations such as photographs), a system or mode must be chosen carefully after trial periods of modeling and ongoing diagnostic teaching. The system selected must suit the individual's communicative profile in terms of conceptual as well as motor and perceptual considerations (Schuler, 1985), and must be accessible to all pertinent communication partners, allowing for high rates of communicative initiations and responses. (For a more detailed discussion of these issues as they pertain to autism, see Bedrosian, 1996; Beukelman & Mirenda, 1992; Mirenda & Schuler, 1988; Schuler, 1985; Schuler & Baldwin, 1981.) Table 24.9 lists the commonly used AAC options for persons with autism and PDD.

TABLE 24.9 AAC Options for Nonspeaking Individuals

1. Objects for exchange or indication—a cup for a drink, cookies in a plastic bag (point or touch), and so on.
2. Pictures/Picture symbols for exchange or indicative gesture.
3. Signs.
4. Printed words.
5. Computers or other electronic aids: using overlays of pictures/words (with the option of vocal output).
6. Letter boards or electronic keyboards.

The selection of one particular system does not necessarily exclude the introduction of an additional system. We have been successful in using concrete visuospatial systems that incorporate drawings, written words, magazine pictures, and photographs. These are most helpful in relaying concrete information—requests for objects, comments on observations, and so on. When other less tangible communicative functions are involved, such as emotional expression, these means may not allow for sufficient immediate expressive powers. We have used signs and sign adaptations in reference to emotional states such as anger, frustration, happiness, and so on. When a sign is designed to express an initial message, the message may be followed up by more specific messages through combinations of pictures, written words, and other systems. Rapid advances in technology allow increasing use of computer-assisted systems and/or some type of voice output, which can be most empowering.

Implement AAC Options

Frequent problems that limit an individual's full potential use of augmentative devices include: (a) a fragmented approach to designing systems for individuals rather than considering daily activities and routines in the context of day care or classroom settings, and (b) the partner's limited modeling of interactive use of symbols (Goossens, 1990). The following guidelines for arranging or "engineering" environments to support interactive augmentative

communication are based on the work of Goossens' (1990). She has provided numerous suggestions for ensuring that preschool individuals' augmentative communication needs are fulfilled, and she promotes the use of "aided language stimulation" on an ongoing basis. Her approach refers to the interactive modeling of augmentative systems, highlighting pictures or picture symbols on an individual's communication display while providing appropriate oral language input. General guidelines for using this approach include: (a) using simple utterances about ongoing activities; (b) speaking slowly; (c) commenting about activities rather than using primarily questions or directives; (d) pausing frequently to allow the individual to take turns; and (e) expanding on the individual's utterances. Initially, the vocabulary used should be relevant to the activity and should reflect early semantic functions and relations. For highly distractible individuals, Goossens recommends using handheld lights or noisemakers to bring an individual's attention to a target picture.

Additional suggestions made by Goossens are:

1. Requesting should be a first expressive goal and frequent opportunities for choicemaking should be provided. Requesting is highly motivating and allows individuals to experience the power of communication. Within these contexts, opportunities to reject should also be provided.
2. In addition to the specific devices selected for individuals, a variety of representations should be made available in reference to common objects and activities. For developmentally younger individuals, real objects may be the most effective means; photographs or line drawings (e.g., picture communication symbols) may be used for persons capable of responding to more abstract representations. Similarly, when individuals receive services in a center-based or classroom setting, the full range of representations should be made available to accommodate all individuals with special needs.
3. Lower- and higher-level representations should be paired, to enable individuals to move to higher-level representations. For example, real objects may be paired with photographs on a display in which individuals make choices through manual pointing. An ultimate goal (in addition to speech acquisition) is movement to more abstract line drawings, or to the written word.
4. Predictable play routines or caregiving routines should be the primary contexts for facilitating acquisition of augmentative system use, and techniques of cuing, prompting, and fading of cues and prompts should be used systematically within the routines.
5. Larger arrays of vocabulary items should be made available to more capable individuals when they are engaged in activities that involve more complex joint activity routines (e.g., food preparation) and symbolic play. In addition, increased opportunities for repairing communication breakdowns, and for using multiword utterances and more complex language functions (e.g., requesting information), should be modeled and reinforced.

Selecting and Using Communication Aids

Teaching an individual to use a communication board or a similar communication aid follows the basic pattern of any good instructional program that uses direct and naturalistic teaching approaches. The specific communicative behaviors to be used by an individual should be clearly defined. For example, the specific symbols, pictures, or other referents to be used need to be carefully specified, as do the specific behaviors to be demonstrated by the individual in selecting and manipulating those symbols. The communicative function of an individual's behavior should be demonstrated contingent on the occurrence of the prompted and/or modeled communicative behaviors. For example, an individual could be encouraged, through modeling and prompting, to point to a picture of food or juice and immediately be presented with the desired items. Likewise, the individual should be taught to point to a picture of a favorite toy and immediately be allowed to play with that toy. The experience of functional consequences is critical to subsequent spontaneous use. In addition, as noted above in the discussion on aided language stimulation, an adult's use of the communication aid along

with an appropriate level of speech input should be modeled throughout the day in relevant contexts.

In designing and teaching the use of communication aids, the following points should be remembered:

1. The individual must have ready access to a device if it is to become a meaningful communication tool. For example, if a communication board is used only in limited activities, the probability of generalization becomes very small. If the board itself is not readily available, the individual should always have a means to request the board, through gestures, vocalization or verbalization, or other signals (e.g., a light or buzzer).
2. The symbol system used on the board should be accessible and appropriate to the individual's level of cognitive development and learning style.
3. The symbols on the board should represent ideas or wishes the individual frequently needs to express.
4. The family and other significant persons in the individual's environment should be involved in the selection of an appropriate communication aid or system.
5. Decisions about the modes and systems of communication used should always be guided by the results of trial teaching sessions and the input and feedback of all involved parties.

OTHER GOALS FOR COMMUNICATION-RELATED DOMAINS

The expansion of communicative means and functions is of prime importance, but other communicative and communication-related objectives also warrant consideration. A detailed discussion of a greater variety of goals related to communication extends beyond the scope of this chapter; nevertheless, examples are included, organized according to the domains in the Social Communication Assessment-Intervention Framework presented in Chapter 25. Table 24.10 provides examples of different objectives, across those domains, that are relevant to individuals at prelinguistic levels. For further discussion of goals and strategies for persons at prelinguistic levels, see Watson et al. (1989), Quill (1995), and Prizant and Wetherby (1988, 1993a, 1993b).

SUMMARY AND CONCLUSIONS

This chapter has focused on assessment and intervention issues specific to the social, communicative, and cognitive characteristics of individuals with autism and PDD who are at prelinguistic levels. But communication goals should never be defined only in terms of these intrinsic considerations. We advocate a more ecological orientation. Intervention efforts should try to identify which contexts and which styles of interaction and language use most facilitate communicative exchanges. One goal is important: that the individuals involved learn to be more active participants in the social interactions taking place around them. The combined force of responsive communication partners and the motivating social contexts makes the enhancement of communication a collaborative rather than a solitary effort, and therefore a truly interactive process.

Efforts to enhance communication should be based directly on an individual's current behavioral and communicative repertoire, and on future needs. More specific decisions regarding content and context of intervention efforts should be fine-tuned, based on the assessment of related cognitive and socioemotional abilities and ongoing diagnostic teaching. Another intervention consideration in selecting content lies in the individual's perspective of the world. Too often, utterances and exchanges targeted for intervention are based solely on a predetermined program that may be peripheral to an individual's daily experiences and interests. The most logical content for communicative behavior lies in communicating about events that make sense, and with people who matter to an individual.

Cross-References

General aspects of communicative development are discussed in Chapter 9. Issues in assessment are dealt with in Chapters 19 through 21. Curriculum development is detailed in Chapter 22. Other aspects of communication

TABLE 24.10 Goals for Communication and Related Domains for Persons at Prelinguistic Levels

Language and Communication	
Expressive	**Receptive**
Establishes anticipatory and early intentional behaviors.	Responds to gestures and/or gaze of others.
Replaces idiosyncratic communicative means (such as reenactments) with more conventional and intentional gestures, such as an extended hand or a pointing gesture.	Responds to picture/written-word symbols of other augmentative means presented by others.
Establishes multiple means of communication by adding vocalizations to nonvocal means.	Responds to own name when called by others.
Expands the range of functions or purposes for communication.	Associates single words, or short phrases, with their referents when used in context.
Develops strategies to persist in communication and to repair breakdowns.	Recognizes basic written-word labels, including own name, names of family members, and basic objects in daily environment.
Develops use of aided or more formal AAC systems to communicate intentions.	

Cognitive Abilities/Symbolic Representation			
Symbolic Play	**Combinatorial/ Constructive Play**	**Imitation**	**Anticipation of Routines/ Event Knowledge**
Uses objects in non-stereotypic functional ways.	Plays with blocks or other construction toys for longer periods of time.	Imitates when own behavior is imitated by adults or peers.	Shows anticipation of routine completion.
Plays in proximity to adult or peers.	Plays with blocks or other construction toys in closer proximity to peers.	Imitates when prompted.	Initiates corrective action when routine is violated.
Shares toy or other focus of joint attention.	Creates more elaborate constructions.	Imitates spontaneously.	Demonstrates anticipation of simple peekaboo, tickle, or hand-slap ("high-five") routine.
Displays pretend behaviors with toys or common objects.		Imitates for purposes of problem solving.	Demonstrates recognition of simple story plot and/or video sequence (either oral or visual).
		Imitates for social purposes.	

Social-Communicative and Socioemotional				
Communicative Functions— Behavior Regulation	**Communicative Functions— Joint Attention**	**Reciprocity**	**Social-Affective Signaling**	**Emotional Expression/ Regulation**
Expresses basic request for favorite item in sight.	Looks at same toy that parent or peer is looking at (and touches or explores that toy together?).	Increases number of intentional communicative acts.	Adds gaze (active or passive) to turn-taking interaction.	Responds appropriately to display of marked affect by parents, peers, or other caregivers.
Expresses basic request for favorite item just removed from sight.	Draws adult or peer attention to focus of current attention (e.g., point or vocalize to toy, display).	Restores an interrupted routine.	Increases display of positive affect in playlike situations.	Attunes to affect of interactant in playlike interaction.
Expresses basic request for desired adult action.		Repeats acts, utilizing an additional communicative means when communicative initiation is not responded to.	Decreases display of unregulated negative affect.	Responds to others' efforts to calm when emotionally aroused.
Expresses basic request for adult/peer/ sibling to sit near/be close.		Responds to communicative initiations of others when approached verbally and/or nonverbally at a specified level.		Develops self-regulatory strategies to calm when aroused.
Behavioral regulation.				

interventions are the subject of Chapters 23 and 25.

REFERENCES

Bates, E. (1976). *Language and context: The acquisition of pragmatics.* New York: Academic Press.

Bates, E. (1979). *The emergence of symbols: Cognition and communication in infancy.* New York: Academic Press.

Bedrosian, J. (1996). Efficacy of emergent literacy intervention with young AAC system users. *Proceedings from 7th Biennial Conference of the International Society for Augmentative and Alternative Communication,* Vancouver, August 7–10, 207–208.

Beukelman, D., & Mirenda, P. (1992). *Augmentative and alternative communication: Management of severe communication disorders in children and adults.* Baltimore: Brookes.

Biklen, D. (1990). Communication unbound: Autism and praxis. *Harvard Educational Review, 60,* 291–314.

Birnbrauer, J. S., & Leach, D. J. (1993). The Murdoch early intervention program after 2 years. *Behaviour Change, 10*(2), 63–74.

Bishop, K., Rankin, J., & Mirenda, P. (1994). Impact of graphic symbol use on reading acquisition. *Augmentative and Alternative Communication (AAC), 10*(2), 113–125.

Bricker, W.A., Macke, P.R., & Levin, J.A. (1981). The modifiability of intelligent behavior. *Journal of Special Education, 10,* 145–162.

Bruner, J. (1975). From communication to language: A psychological perspective. *Cognition, 3,* 255–289.

Bruner, J. (1981). The social context of language acquisition. *Language and Communication, 1,* 155–178.

Carr, E.G. (1977). The motivation of self-injurious behavior: A review of some hypotheses. *Psychological Bulletin, 84,* 800–816.

Carr, E.G. (1985). Behavioral approaches to language and communication. In E. Schopler & G. Mesibov (Eds.), *Communication problems in autism* (pp. 37–59). New York: Plenum Press.

Carr, E.G., & Carlson, J.I. (1993). Reduction of severe behavior problems in the community using a multicomponent treatment approach. *Journal of Applied Behavior Analysis, 26,* 157–172.

Carr, E.G., & Durand, V.M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis, 18,* 111–126.

Carr, E.G., Levin, L., McConnachie, G., Carlson, J.I., Kemp, D.C., & Smith, C.A. (1994). *Communication-based intervention for problem behavior: A user's guide for producing positive change.* Baltimore: Brookes.

Charlop, M.H., & Haymes, L.K. (1994). Speech and language acquisition and intervention. Behavioral approaches. In J. Matson (Ed.), *Autism in children and adults: Etiology, assessment and intervention.* Pacific Grove, CA: Brooks/Cole.

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

Damico, J., Secord, W., & Wiig, E. (1992). Descriptive language assessment at school: Characteristics and design. In W. Secord (Ed.), *Best practices in school speech-language pathology* (pp. 1–8). San Antonio, TX: Psychological Corp.

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.

Donaldson, M. (1978). *Children's minds.* Glasgow, Scotland: Fontana.

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. (1983). Autistic children are noninteractive: Or so we say. *Seminars in Speech and Language, 4,* 63–78.

Duchan, J.F. (1986). Language intervention through sensemaking and finetuning. In R. Schiefelbusch (Ed.), *Assessment and language intervention* (pp. 187–213). Baltimore: University Park Press.

Duchan, J.F. (1989). Evaluating adults' talk to children: Assessing adult attunement. *Seminars in Speech and Language, 10,* 17–27.

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

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

Durand, V.M., & Carr, E.G. (1992). An analysis of maintenance following functional communication training. *Journal of Applied Behavior Analysis, 25,* 777–794.

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

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

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.

Goossens, C. (1990, March). *Engineering the preschool classroom environment for interactive symbolic communication.* Workshop presented at Bradley Hospital, East Providence, RI.

Grandin, T. (1995a). The learning style of persons with autism: An autobiography. In K. Quill (Ed)., *Teaching children with autism: Strategies to enhance communication and social behavior.* Albany, NY: Delmar.

Grandin, T. (1995b). *Thinking in pictures and other reports of my life with autism.* New York: Doubleday.

Greenspan, S.I. (1992). Reconsidering the diagnosis and treatment of very young children with autism spectrum or Pervasive Developmental Disorder. *Zero to Three, 13,* 1–9.

Halle, J.W. (1984). Arranging the natural environment to occasion language. Giving severely language delayed children reasons to communicate. *Seminars in Speech and Language, 5,* 185–197.

Halle, J.W. (1993). Innovative assessment measures and practices designed with the goal of achieving functional communication and integration. In L. Kupper (Ed.), *The National Symposium on Effective Communication for Children and Youth with Severe Disabilities.* Washington, DC: U.S. Department of Education, Office of Special Education & Rehabilitative Services (OSERS).

Harris, S.L., & Handelman, J.S. (1994). *Preschool education programs for children with autism.* Austin, TX: Pro-Ed.

Hart, B. (1981). Pragmatics and language development: How language is used. *Analysis and Intervention in Developmental Disabilities, 1,* 299–313.

Howlin, P. (1981). The effectiveness of parent language training with autistic children. *Journal of Autism and Developmental Disorders, 11,* 54–69.

Kahn, J.V. (1975). Relationship of Piaget's sensorimotor period to language acquisition of profoundly retarded children. *American Journal of Mental Deficiency, 79,* 640–643.

Kaiser, A.P., & Goetz, L. (1993). Enhancing communication with persons labeled severely disabled. *Journal of the Association for Persons with Severe Handicaps, 18,* 137–142.

Kalmanson, B., & Pekarsky, J.H. (1987, Winter). Infant parent psychotherapy with an autistic toddler. *Infant Mental Health Journal, 8*(4), 18–27.

Kanner, L. (1943). Autistic disturbances of affective contact. *Nervous Child, 2,* 217–250.

Koegel, R.L., Camarata, S.M., & Koegel, L.K. (1994). Aggression and noncompliance: Behavior modification through naturalistic language remediation. In J. Matson (Ed.), *Autism in children and adults: Etiology, assessment and intervention* (pp. 165–180). Pacific Grove, CA: Brooks/Cole.

Koegel, R.L., & Johnson, J. (1989). Motivating language use in autistic children. In G. Dawson (Ed.), *Autism: New perspectives on diagnosis, nature and treatment.* New York: Guilford Press.

Koppenhaver, D., & Yoder, D. (1992). Literacy learning. *Seminars in Speech and Langauge, 13*(2), 143–164.

Lahey, M. (1988). *Language disorders and language development.* New York: Macmillan.

Lord, C. (1985). Autism and the comprehension of language. In E. Schopler & G.B. Mesibov (Eds.), *Communication problems in autism* (pp. 257–281). New York: Plenum Press.

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

McCune, L. (1995). A normative study of representational play at the transition to language. *Developmental Psychology, 31,* 198–206.

McCune-Nicolich, L. (1981). Toward symbolic functioning: Structure of early pretend games and potential parallels with language. *Child Development, 52,* 785–797.

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

McNaughton, S., & Lindsay, P. (1995). Approaching literacy with AAC graphics. *Augmentative and Alternative Communication (AAC), 11*(4), 212–228.

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

Mirenda, P., & Schuler, A.L. (1988). Augmenting communication for persons with autism: Issues and strategies. *Topics in Language Disorders, 9*, 24–43.

Olswang, L., Bain, B., & Johnson, G. (1992). Using dynamic assessment with children with language disorders. In S. Warren & J. Reichle (Eds.), *Causes and effects in communication and language intervention* (pp. 187–215). Baltimore: Brookes.

Papy, F., Papy, G., & Schuler, A.L. (1995). *La pensee hors language de l'enfant autiste*. Paris: Bayard Press.

Papy, F., Schuler, A., & Papy, G. (1994). *Pensiero autistico senza linguaggio: Incontri con spiriti non fertilizzati dalla necessita di stabilire relazioni sociali*. Bologna, Italy: Pitagora Editrice Bologna.

Peck, C.A. (1986). *Student control in classrooms for children with severe handicaps: Effects on student behavior and perceived social climate*. Unpublished doctoral dissertation, University of California, Santa Barbara.

Peck, C.A. (1989). Assessment of social communicative competence: Evaluating environments. *Seminars in Speech and Language, 10*, 1–15.

Peck, C.A., & Schuler, A.L. (1987). Assessment of social/communicative behavior for students with autism and severe handicaps: The importance of asking the right question. In T. Layton (Ed.), *Language and treatment of autistic and developmentally disordered children* (pp. 35–58). Springfield, IL: Thomas.

Peck, C.A., Schuler, A.L., Tomlinson, C., Theimer, K., & Haring, T. (1983). *Social competence curriculum project: Assessment handbook*. Santa Barbara: University of California, Special Education Research Institute.

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

Prizant, B.M. (1986). *Social relatedness and communicatively impaired children*. Paper presented at the Third Sino-American Symposium on Speech Pathology and Communication Disorders, Taipei, Taiwan.

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

Prizant, B.M., & Meyer, E. (1993). Socioemotional aspects of communication disorders in young children. *American Journal of Speech-Language Pathology, 2*, 56–71.

Prizant, B.M., & Wetherby, A.M. (1985). Intentional communicative behavior of children with autism: Theoretical and applied issues. *Australian Journal of Human Communication Disorders, 13*, 21–58.

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

Prizant, B.M., & Wetherby, A.M. (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.M., & Wetherby, A.M. (1990). Toward an integrated view of early language, communication and socioemotional development. *Topics in Language Disorders, 10*, 1–16.

Prizant, B.M., & Wetherby, A.M. (1993a). Communication and language assessment for young children. *Infants and Young Children, 5*, 20–34.

Prizant, B.M., & Wetherby, A.M. (1993b). Communication in preschool autistic children. In E. Schopler, M. van Bourgandien, & M. Bristol (Eds.), *Preschool issues in autism* (pp. 95–128). New York: Plenum Press.

Quill, K. (1995). Enhancing children's social-communicative interactions. In K. Quill (Ed.), *Teaching children with autism: Methods to enhance communication and socialization*. Albany, NY: Delmar.

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

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

Rice, M.L., & Kemper, S. (1984). *Child language and cognition*. Baltimore: University Park Press.

Rogers, S.J. (1996). Brief report: Early intervention in autism. *Journal of Autism and Developmental Disorders, 26*(2), 243–246.

Rowland, C., & Schweigert, P. (1993). Analyzing the communication environment to increase functional communication. *Journal of the Association for Persons with Severe Handicaps, 18*, 161–176.

Rydell, P., & Prizant, B. (1995). Assessment and intervention strategies for children who use echolalia. In K.A. Quill (Ed.), *Teaching children with autism: Strategies to enhance communication and socialization*. Albany, NY: Delmar.

Weeks, M., & Gaylord-Ross, R. (1981). Task difficulty and aberrant behavior in severely handicapped students. *Journal of Applied Behavior Analysis, 14,* 449–463.

Wetherby, A.M. (1983). *Cognitive and communicative/social development in autistic children.* Unpublished doctoral dissertation, University of California, San Francisco.

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

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

Wetherby, A.M., & Prizant, B. (1992a). Profiling young children's communicative competence. In S. Warren & J. Reichle (Eds.), *Perspective on communication and language intervention: Development, assessment, and intervention* (pp. 217–251). Baltimore: Brookes.

Wetherby, A.M., & Prizant, B. (1992b). Facilitating language and communication development in autism: Assessment and intervention guidelines. In D.E. Berkell (Ed.), *Autism: Identification, education, and treatment* (pp. 107–134). Hillsdale, NJ: Erlbaum.

Wetherby, A.M., & Prizant, B. (1993a). *Communication and Symbolic Behavior Scales* (Normed ed.). Chicago: Riverside.

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

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

Willard, C., & Schuler, A.L. (1987). Social transactions: A vehicle for intervention. In T. Layton (Ed.), *Language and treatment of autistic and developmentally disordered children* (pp. 265–287). Springfield, IL: Thomas.

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. (1995). Enhancing children's play. In K.A. Quill (Ed.), *Teaching children with autism: Strategies to enhance communication and socialization* (pp. 193–218). Albany, NY: Delmar.

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.