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Developing an Initial Communicative Repertoire

Applications and Issues for Persons with Severe Disabilities

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RESEARCHERS AND PRACTITIONERS ARE INCREASINGLY aware of the extent of communicative relationships very early in development. Advances in understanding how communication develops and how it can be taught have made earlier communication intervention a viable undertaking for infants and toddlers who experience developmental disabilities. Advances in our ability to establish functional communication skills in the absence of verbal communicative behavior have created new options for intervention for children who have insufficient structure or function of their speech mechanisms to permit spoken communication. As instructional technology has advanced, the acquisition and generalization of new communicative behavior have come to be viewed as part of the same instructional objective, rather than as a sequence of different related objectives. Most recently, interventionists have begun developing intervention strategies that allow effective intervention to be conducted in the learner's regular, natural environments (Kaiser, chap. 4, this volume; Tannock & Girolametto, 1992). Developing such strategies is a particularly critical undertaking, because most intervention opportunities with infants and toddlers occur in the milieu of daily routines in home environments.

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Traditionally, most communication intervention strategies were designed to establish an initial repertoire of specific vocabulary to express identified pragmatic functions in interactive exchanges (i.e., Guess, Sailor, & Baer, 1974; Kent, 1974). To the communication interventionist, this is a particularly challenging task, because a number of separable, yet integrally related, aspects of communication can be addressed concurrently. Recently, attention has focused on concurrent intervention to teach communicative forms and functions in the milieu of daily activities (Alpert & Kaiser, in preparation; MacDonald, 1989; Mahoney & Powell, 1986; Weistuch & Lewis, 1986; Yoder & Davies, 1990).

The purpose of this chapter is to characterize major issues that communication interventionists face in selecting and implementing strategies for establishing an initial communicative repertoire in individuals with severe and multiple developmental disabilities. The majority of issues discussed here are most applicable to individuals with severe mental retardation who also have other handicapping conditions, although many issues raised are applicable to individuals with less severe disabilities. We assume that all learners, regardless of their developmental status or chronological age, are candidates for communication intervention. Furthermore, we believe that to the greatest extent possible, intervention should be implemented in the milieu of the learner's natural environments using the least intrusive intervention strategies that have been carefully validated. In this chapter, we explore decision points that must be addressed in order to select what to teach and how to teach it. We begin by tackling the issue of whether initial communicative behavior must be taught in the context of a conversation. Next, we focus on decisions that ensure that initial pragmatic forms selected for intervention actually correspond to the social function that the learner's informal means to convey wants and needs fulfill. Ensuring the best match between pragmatic and social functions may require careful sequencing of intervention procedures. Our discussion next focuses on gestural and graphic options to supplement vocal production for individuals who have severe structural or functional impairments of the speech mechanism. We then discuss issues that arise as a result of the learner's current informal communicative behavior (including challenging behavior). Finally, we discuss variables that influence the extent to which a learner utilizes his or her established communicative repertoire to take advantage of a wide range of conversational opportunities afforded by the natural environment.

IDENTIFYING LEARNERS WHO MAY BENEFIT FROM A CONVERSATIONAL INTERVENTION CONTEXT

A number of investigators have suggested that communicative behavior must be established in the context of conversations and interactive routines (e.g.,

MacDonald, 1989). Goldstein and Kaczmarek (1992) state that "central to preschool experience of all children is learning to interact with a variety of other children. . ." (p. 81). Yoder, Davies, and Bishop (1992) suggest that engaging in conversational behavior actually serves to facilitate language acquisition in several distinct ways. First, conversational exchanges provide opportunities for adults to expand children's utterances in accordance with milieu approaches to intervention (Warren & Rogers-Warren, 1985). Second, continuing a child's topic appears to increase the likelihood that the child will be more motivated to provide an utterance related to the speaking partner's utterance (Miller, MacKenzie, & Chapman, 1981). Establishing communicative behavior in a conversational framework affords the greatest opportunity for generalized conversational use; however, for some learners it is more straightforward to begin with establishing instrumental communicative functions, with limited emphasis on the conversational aspects of language. For example, referring to the use of a focus on natural episodes of conversation as the exclusive medium for communication intervention, Tannock and Girolametto (1992) stated that, "The extent of the child's disability may constrain what can be achieved by this model of intervention: children who are unable to organize information in a normal manner may benefit from more direct instructional approaches. . ." (p. 72). Although we believe that the most progressive intervention program focuses on intervention in the context of conversational flow, there may be special instances that require consideration of pragmatic functions outside the flow of a conversation.

Reichle (1990a) described a group of persons with moderate and severe developmental disabilities who had not yet learned to enjoy the company of others. Individuals who do not appear to enjoy interactions have been the focus of a number of empirical investigations (see Reichle, York, & Eynon, 1989). In many instances, these individuals invest significant energy to escape from or avoid interactions with others. For these individuals, establishing conversational exchanges would represent an unusually difficult initial communicative objective. In some instances, escape from social interaction represents an important desire, and there are few other readily identifiable environmental circumstances that are of equal importance or interest to the individual. In this case, establishing a "rejecting" or "leavetaking" utterance may be very important in teaching the learner that communicative behavior provides powerful control over one's environment.

Reichle (1991) conducted an investigation in which two learners with severe handicaps were taught to obtain desired items by seeking out adults and producing requests. By establishing a series of conditional discriminations, learners were successful in using an adult as a mediator when desired items could not be reached and in obtaining items independently when they were within reach. However, unless a desired item was the focus, the learners displayed little interest in social interaction. For the most part, when con-

fronted with a prospective communicative partner, these learners attempted to withdraw to the privacy of their rooms rather than remain in close physical proximity to other individuals. Interactive exchanges may indeed be a viable intervention objective for all individuals. At the same time, however, the interventionist's *initial* objective should be to teach learners that they can exert significant control over important aspects of their environment. Sometimes this may be demonstrated through brief and somewhat one-sided exchanges.

For some learners, we believe that early pragmatic intervention strategies should target instrumental communicative intent through relatively abrupt exchanges in which conversation per se is not the primary short-term objective. Alternatively, with learners who are highly motivated to seek and maintain contact with others, interactional aspects of a conversation may receive greater emphasis. With both groups of learners, describing the reason for the learner's production of a communicative behavior is at the heart of determining the appropriate intervention contexts. Consequently, it is very important that the interventionist scrutinize the learner's communicative obligations and opportunities in a wide range of functional environments to ensure that the utterances taught closely match the social functions of the learner's existing communicative behaviors.

DISTINGUISHING BETWEEN PRAGMATIC FORM AND SOCIAL FUNCTION

Traditionally, communication interventionists have focused on syntactic, morphological, and semantic topographies as targets for beginning communication intervention. As late as the mid- to late 1970s, interventionists focused on teaching grammatical relationships among subjects, verbs, and objects. The operating assumption was that once these forms were taught, the learner would be able to generalize them to the appropriate social contexts.

Unfortunately, once a vocabulary item had been taught in the context of one particular communicative function (i.e., a request), learners (including normally developing children) often appeared to fail to generalize the use of the item to express other communicative functions (Lamarre & Holland, 1985; Reichle, Schermer, & Anderson, 1990). Limited generalization prompted interventionists to focus more on communicative functions and to design taxonomies describing the range of communicative functions that specific vocabulary must address in order for an individual to establish a functional communicative repertoire. Interventionists have increased their emphasis on the communicative function of vocabulary as a result of the growing interest in identifying beginning, proactive communicative repertoires with individuals who communicate using socially unacceptable behavior. Finally, an increasing emphasis on intervening at the earliest possible point in a

learner's educational career continues to generate interest in pragmatically referenced intervention strategies.

Carr (1977) hypothesized that many individuals who engage in repertoires of highly idiosyncratic and challenging behavior may do so in order to express a variety of pragmatic functions, which include to obtain attention, desired items, or events, or to escape or avoid interactions with persons or activities. The communicative hypothesis suggests that interventionists should teach communicative forms that are functionally equivalent to the highly idiosyncratic or socially unacceptable forms. Inherent in the communicative hypothesis is the notion of *functional equivalence*. Replacing repertoires of challenging behavior requires that the interventionist precisely match the learner's social intent with the communicative form or function selected for intervention (Carr & Durand 1985). Matching communicative form to social function has focused the communication assessment process for those learners who engage in challenging behavior on incorporating a functional analysis of the learners' current behavior (both vocal and nonvocal).

For those who work with infants and toddlers, the 1980s and early 1990s have resulted in an increasing awareness of the importance of establishing beginning communicative repertoires at increasingly early ages. It is apparent that, initially, very young children engage in natural gestures and vocal behaviors that express a range of social-communicative functions. Because of their limited vocabularies, children who are developing normally often rely on relatively generalized vocabulary associated with an entire response class (e.g., "more" → request, "no" → reject, "done" → leavetake). Given the limited vocal and verbal imitative abilities of very young children, interventionists have become increasingly interested in the range of vocal and gestural behaviors produced by infants and toddlers that can be shaped into acceptable expressions of social-communicative functions. This interest, in turn, has generated interest in systems that can be used to characterize the early social-communicative functions that are expressed by children who are developing normally, as well as children with developmental disabilities.

DESCRIBING COMMUNICATIVE FUNCTIONS

A number of investigators have devised taxonomies to describe instrumental communicative intents (Cirrin & Rowland, 1985; Dore, 1975; Wetherby & Prizant, 1992). Instrumental intents describe why the learner produced a particular utterance, regardless of where it occurred in the flow of an interaction. For example, an individual could "request an object," "comment," or "protest" at any point in an interaction. Five taxonomies are compared in Table 1, which illustrates the similarities and differences among current strategies used to describe communicative functions.

Table 1. Taxonomies designed to describe instrumental communicative intents

Wetherby and Prizant (1989)	Cirrin and Rowland (1985)	McLean and Snyder-McLean (1991)	Coggins and Carpenter (1978)	Dore (1975)
Comment on object: Acts used to direct another's attention to an entity.	**Direct attention to object:** Direction of listener's attention to an external, observable referent, or some object identified by the child. This includes the speaker taking notice of an object, or labeling an object in absence of a request.	**Request attention to other:** Behavior used to direct the communicative partner's attention to some object, person (other than self), event, or state of affairs.		
			Transferring: Gestures intended to place an object in another person's possession.	
				Labeling: Uses word while attending to object or event. Does not address adult or wait for a response.
Comment on action: Acts used to direct another's attention to an event.	**Direct attention to action:** Direction of listener's attention to an ongoing action or event in the environment. The focus may be the movement or action of an object rather than the object itself. A	(Refer to **Request attention to other**)		

	"comment" on some ongoing activity.			
Show-off: Acts used to attract another's attention to oneself.	**Direct attention to self:** Direction of listener's attention to the child as a general attention-getter for some unspecified social purpose.	**Request attention to self:** Behavior used to attract attention to oneself. No other referent is indicated.	**Showing off:** Gestures or utterances that appear to be used to attract attention.	
Call: Acts used to gain the attention of others, usually to indicate that a communicative act is to follow.	**Direct attention for communication:** Direction of listener's attention to self as a preface to another communicative behavior that follows immediately.	(Refer to **Request attention to self**)	(Refer to **Showing off**)	**Calling:** Calls adult's name loudly and awaits response.
Acknowledgment: Acts used to indicate notice of another person's previous statement or utterance.			**Acknowledging:** Gestures or utterances that provide notice that the listener's previous utterances were received.	
	Answer: A communicative response from a child to a request for information from the adult listener. This typically takes the form of indicating a choice		**Answering:** Gestures or utterances from the child in response to a request for information from the listener.	**Answering:** Answers adult's question. Addresses adult.

(*continued*)

Table 1. (*continued*)

Wetherby and Prizant (1989)	Cirrin and Rowland (1985)	McLean and Snyder-McLean (1991)	Coggins and Carpenter (1978)	Dore (1975)
	Answer (*continued*) or answering a question.			
Clarification: Acts used to clarify the previous utterance.				
Request object: Acts used to demand a desired tangible object.	**Request object:** Seeks the receipt of a specific object from the listener where the child awaits a response. The object may be out of reach due to some physical barrier.	**Request object:** Behavior used to request an object. Interest is on the object desired.	**Requesting object:** Gestures or utterances that direct the listener to provide some object for the child.	**Requesting:** Asks question with a word, sometimes with accompanying gesture. Addresses adult and awaits response.
Request action: Acts used to command another to carry out an action.	**Request action:** Seeks the performance of an action by the listener where the child awaits a response. The child may specify the action (e.g., "sit") or the child's immediately preceding behavior gives evidence that he or she realizes that some action is a necessary step to obtaining some object (e.g., signaling "help" to open a jar).	**Request instrumental action:** Behavior used to direct a communicative partner to carry out action facilitating access to an object or attainment of a desired effect.	**Requesting action:** Gestures or utterances that direct the listener to act upon some object in order to make it move. The action, rather than the object, is the focus of the child's interest.	**Requesting action:** Word or vocalization often accompanied by gesture signaling demand. Addresses adult and awaits response.

Request information: Acts used to seek information, explanation, or clarification about an object, event, or previous utterance. Includes *wh*-question and other utterances having the intonation contour of an interrogative.	**Request information:** Seeks information, approval, or permission from the listener where the child awaits a response. This includes directing the listener to provide specific information about an object, action, or location.	**Request information/feedback:** Behavior used to direct the communicative partner to provide information about an object, action, or location; to request approval/nonapproval, permission, or affirmation.	**Requesting information:** Gestures or utterances that direct the listener to provide information about an object, action, or location.
Request permission: Acts used to seek another's consent or carry out an action; involves the child carrying out or wishing to carry out the action.	(Refer to **Request information**)	(Refer to **Request information/feedback**)	
Request social routine: Acts used to command another to commence or continue carrying out a game-like social interaction.	(Refer to **Request action**)	**Request noninstrumental action:** Behavior used to direct a communicative partner's actions. Goal is to instigate other's actions rather than obtain an object or effect.	

(*continued*)

Table 1. (*continued*)

Wetherby and Prizant (1989)	*Cirrin and Rowland* (1985)	*McLean and Snyder-McLean* (1991)	*Coggins and Carpenter* (1978)	Dore (1975)
Protest: Acts used to refuse an undesired object or to command another to cease an undesired action.		**Request cessation Reject/avoid:** Behavior used to request a communicative partner to cease an undesired action or activity or to reject an offered object or anticipated event.		**Protesting:** Resists adult's action with word or cry. Addresses adult.
Greet: Acts used to gain another's attention to indicate notice of presence, or to indicate notice of the initiation or termination of an interaction.			**Greeting:** Gestures or utterances subsequent to a person's entrance that express recognition.	**Greeting:** Greets adult or objects upon appearance.
				Repeating: Repeats part or all of prior adult utterance. Does not wait for a response.
				Practicing: Use of word or prosodic pattern in absence of any specific object or event. Does not address adult. Does not await response.

Lack of an entry indicates that a similar intent did not exist in that particular taxonomy.

Given the numerous descriptive taxonomies available to the interventionist, describing the reason for the production of any given utterance would seem to be a relatively straightforward proposition. However, we believe it is easy to misuse pragmatic taxonomies, and to describe communicative *forms* rather than *functions*. For example, consider a learner who is grudgingly engaged in homework. Approximately 1 minute into the task he says, "Mom, can you help me?" His mother dutifully assists him with his first problem. Several minutes later, the learner is again requesting assistance with his assignment. After 10 requests, his assignment has been completed, but the learner has not solved a single problem without his mother's assistance. Most pragmatic taxonomies would have described the learner's behavior as a series of "requests for assistance" or "requests for action," based on the form of utterances and the context. A functional assessment of the situation, however, might suggest that the learner's communicative behavior functioned to avoid or escape engagement in the activity. A request for assistance, in some instances, may serve as a strategy to obtain a highly preferred item (e.g., obtaining assistance to unwrap a piece of candy). On other occasions, requests for assistance may be attempts to escape from an unpleasant task (e.g., homework). Unless the full range of relevant stimulus conditions are addressed during intervention, the interventionist cannot conclude that the learner will generalize across the complete range of environmental circumstances in which the pragmatic functions being taught can be used. Reichle (1990b) reported instances in which a learner, taught to "request assistance" exclusively in the presence of opportunities to escape or avoid highly nonpreferred activities, failed to generalize the use of "request assistance" vocabulary to obtain desired objects and events (e.g., candy that the learner needed help unwrapping). Reichle (1990b) also reported an instance in which a learner with severe developmental disabilities was taught a general rejecting gesture ("no"). All of the identified teaching opportunities occurred when the learner was offered a highly *nonpreferred* object or event. Over time, the learner used a rejecting utterance whenever an offer of an undesired item was made. One of this individual's preferred activities was to go to a coffee shop on Saturday morning for coffee and sweet rolls. Generalization probes conducted in this setting demonstrated that the reject gesture had generalized to previously untrained and undesired breakfast items. For example, when offered bacon or sausage (highly nonpreferred items), the individual gave his rejecting response. However, when offered refills of coffee (a highly preferred item) when he did not wish more, he failed to produce his newly established rejecting utterance. As the intervention process proceeded, it became increasingly clear that, inadvertently, the interventionists had taught the learner to use a rejecting gesture for only a subset of the full range of important functional opportunities.

Our concern is that researchers and interventionists may sometimes fail to match the pragmatic form being taught with the full *range* of social functions that the new utterance is expected to serve. Just as insufficient teaching examples resulted in the problem just described, the same problem may result in the interventionist's attempts to ensure that any given communicative function will be used across a range of different conversational opportunities. For example, Table 2 provides a matrix referenced on the vertical axis by communicative functions (request, reject, and comment). The horizontal axis is referenced by the conversational functions of initiate, maintain, and terminate. For example, it seems reasonable to hypothesize that communicative functions taught primarily as conversation-maintaining strategies may not necessarily generalize to conversational functions that involve initiating or terminating social interactions.

In summary, generalization represents a significant challenge to the communication interventionist. First, it is important that the interventionist separate pragmatic forms from the social functions that communicative behaviors may serve. Second, it is important that the examples used to establish initial

Table 2. Interaction between communicative intents and stages of communicative exchanges

		Initiate	Maintain	Terminate
Request	context	A 6-year-old sees a peer on the playground.	A preschool child is watching his mother blow bubbles.	A learner has lost interest in playing with his younger sibling.
	utterance	He approaches the peer and says, "Wanna play?"	He says, "Do it again."	He says, "Wouldn't you like to watch cartoons now?"
Reject	context	Two children are sitting together. Adult asks one child if he wants to go to a movie.	A preschool child is playing a game with her dad.	A learner and his friend are working on a jigsaw puzzle.
	utterance	The other child says, "I don't want to go to a movie."	The child says, "It's not your turn!"	He says, "I'm not doing this anymore."
Comment	context	A child and an adult are walking at the zoo.	A learner and her friend are talking about a television show.	Two children are waiting to be picked up from school.
	utterance	The child says, "A bear!"	The learner says, "I thought that it was funny."	One child says, "Oh, there's my ride."

Adapted from Reichle, York, and Sigafoos (1991).

communication reflect the total range of situations in which a form is appropriate for the learner to use. Consequently, clearly understanding this could be very important to initial establishment of a functional communicative repertoire.

SEQUENCING INTERVENTION PROCEDURES USED TO ESTABLISH A REPERTOIRE OF COMMUNICATIVE FUNCTIONS

Guess et al. (1974) eloquently articulated the logic for selecting particular communicative topographies for instruction. They suggested that it was important to demonstrate to learners that they could exert significant control over their environment with their communicative behavior. In the communication intervention programs of the 1970s, although specific vocabulary representing highly preferred items were included (Bricker & Bricker, 1974; Guess et al., 1974; Kent, 1974), the initial pragmatic function selected for intervention was often "providing information." This somewhat arbitrary selection of pragmatic class created a potential mismatch between the learner's actual intent and the social function being taught by the interventionist. That is, sometimes primary reinforcers that had no direct correspondence to the vocabulary being taught were provided contingent on the production of a correct utterance. It seems reasonable to hypothesize that some learners may have produced the desired vocabulary item as a *request* when, in fact, the interventionist treated the response as if it were a *provision of information.* This mismatch may have influenced subsequent establishment of other social uses of the same vocabulary item.

In fairness, however, early systematic approaches reflected the knowledge base of the time. For the most part, systematic approaches to communication intervention in the 1970s focused on semantic and syntactic structure rather than on pragmatic function. In spite of this orientation, most initial communication intervention programs attempted to address general classes of pragmatic functions, such as requesting objects and providing information. The prescriptiveness in a program such as that offered by Guess et al. (1974) was reflected in the treatment of what have become commonly referred to as pragmatic or communicative functions. For example, Guess et al. (1974) first taught learners to *provide information* in response to a "What's this" question. Subsequently, learners were taught to *request objects. Protesting* was introduced only as a troubleshooting option in a program designed to teach a learner to respond to yes/no questions. Options to sequence the introduction of pragmatic functions were not a prominent feature of most early intervention programs.

The primary individualization in the early communication intervention programs was in the selection of reinforcers to be used in implementing the program, rather than in the individualization of the specific communicative

functions to be taught. Interventionists now recognize that there is a wide range of communicative functions that can be established with a beginning communicator. There appears to be a growing consensus that allowing learners to gain a measure of control over their environments should represent an important criterion for the selection of an initial communicative repertoire (Reichle, York, & Sigafoos, 1991). Today, we recognize that, depending on an individual's preferences, he or she can be taught to exert control over aspects of his or her environment by learning to express a wide variety of communicative functions. In teaching communicative functions, it is very important that the consequences provided by the interventionist match the communicative functions being taught.

Of course, teaching learners to discriminatingly use communicative functions would be easiest if the function could always be associated with the same narrow range of contexts. Unfortunately, this is not the case. For example, convention would suggest that when teaching a general rejecting response, "No, thanks," the interventionist should select items and events that would be maximally discriminable. This logic would result in the interventionist selecting opportunities in which the learner encountered items or events that were strongly disliked. Unfortunately, as we discussed earlier, if the interventionist does not move to less discriminable instances, the rejecting response may not necessarily generalize. Often, intervention procedures to establish a rejecting repertoire focus on teaching examples in which expressing a rejection allows the learner to escape or avoid a highly nonpreferred event. In such a case, a less discriminable event calling for the rejecting response "No, thanks" should occur along with the offer of a desired item in a state of satisfaction. Although it is tempting to focus on only the most salient items or events as discriminative stimuli during intervention, doing so may create overwhelming challenges to generalization.

A related issue involves our tendency as interventionists to view communicative functions as clearly separate and discontinuous classes. To the contrary, in many instances, the distinction between two communicative functions may be somewhat hazy. For example, when asked if he wants a soda, a learner may respond, "Do you have any orange juice?" The function of this utterance is both to reject the soda and to request an alternative. The form of the utterance is a request, but the function of the utterance is also a rejection. We believe that a blurring between pragmatic form and function occur quite often. The interventionist must ensure that careful attention is given to both the form and function of the pragmatic classes being taught so that consistent rules of use are being modeled for the learner.

Available data do not suggest a "best" sequence for introducing a beginning repertoire of communicative functions. For some learners, the strengths of preferred and nonpreferred items may assist in determining which communicative functions might provide the greatest social empowerment. However,

for many learners, we believe that a variety of different communicative functions can be implemented concurrently. For example, at mealtime, an individual may strain to reach for a second dessert item that is out of reach. This event represents a potential opportunity to teach a more conventional requesting strategy. Just a few minutes earlier, the same learner may have pulled away from the offer of more green vegetables (a potential opportunity to teach a more conventional rejecting strategy). In each instance, the learner was highly motivated to engage in two distinctively different communicative functions (request in the former, and reject/protest in the latter).

All of the examples presented clearly show that the interventionist must become sufficiently familiar with the range of situations in which an individual is highly motivated. In practice, the interventionist must match a communicative form with the communicative function that corresponds to the individual's social motivation. If the learner is to have a complete grasp of the communicative forms and functions being taught, it is important to select teaching examples that allow the learner to discriminate functions and when each is used, but at the same time display sufficient variety to ensure the generalized use of each targeted communicative function. Finally, specific pragmatic forms and functions must be well coordinated with other aspects of an individual's communicative repertoire.

To be a competent communicator, it is not enough to know how to use requests to maintain interactions. It is equally important to know that requests can be used to initiate and to terminate interactions. The discriminability and generalizability of initial communicative function depend on the interventionist's skill in: 1) identifying the range of opportunities across which each of the communicative functions can be used, and 2) generating sufficient teaching examples in the early phases of intervention that maximize the discriminability of the communicative functions and at the same time demonstrate the range of situations across which a given communicative function can be used.

IDENTIFYING THE FORMS OF BEHAVIOR USED TO EXPRESS INITIAL COMMUNICATIVE FUNCTIONS

McLean and Snyder-McLean (1988) identified classes of intentional communicative forms that reflect an individual's ability to communicate. The three classes in their taxonomy are primitive, conventional, and referential acts. Primitive acts include gestures that consist of direct motor acts on objects and people. Some common primitive acts include pulling away from an undesired object, gesturing with an object, and leading a person to a desired item or activity. Conventional acts include gestures that do not necessarily involve direct contact with an object or a person (e.g., pointing, motioning for an object to be removed). Referential acts involve the use of symbolic forms and linguistic structures. Examples of referential acts are speaking, signing, or

using graphic symbols to express communicative intents. Traditionally, intervention usually began at the referential level (Bricker & Bricker, 1974; Guess et al., 1974; Kent, 1974). Only recently have interventionists begun to address more primitive and conventional forms of communication (McLean & Snyder-McLean, 1988).

Conventional acts are part of most individuals' permanent communicative repertoires. For example, using the index finger to point is quick and socially acceptable. Pointing has the distinct advantage of allowing interaction with a partner without vocally interrupting an ongoing activity. Some primitive forms of communication also serve very useful functions. For example, if one has a mouth full of food as the host approaches to refill a wine glass, simply proferring one's empty glass is efficient, socially acceptable, and highly communicative. On a cold day when a friend drives by in a car with the windows up, a hand wave is a more acceptable and appropriate form of social greeting than screaming "Hello." From these examples, it is clear that sophisticated communicators possess a repertoire of responses that represent a wide continuum of sophistication.

Unfortunately, not all primitive and conventional forms of communication are socially acceptable. For example, holding one's crotch is highly communicative (i.e., "I need a bathroom, now!") but not very socially acceptable. Other more primitive or conventional forms may be socially acceptable but not very communicative. For example, an individual may point to food placed in the center of the table. However, without additional context, it is unclear whether he or she is "requesting" or "commenting." Furthermore, the specific referent for the communicative production may be unclear.

There are a variety of acceptable forms of behavior that can convey communicative functions. Frequently, the modes selected represent a careful mix of vocalizations (or verbalizations), gestures (natural gestures and/or formal signs), and graphic symbols. We do not believe that the interventionist's task in establishing communicative forms is to move from primitive to more conventional gestures without regard to the learner's existing repertoire. Instead, the task is to use the learner's existing repertoire and determine which aspects of it can be blended or shaped into a well-planned system. This blending requires the thoughtful application of the instructional technologies that have emerged since the 1970s.

DESIGNING INSTRUCTIONAL STRATEGIES THAT CONSIDER EXISTING COMMUNICATIVE REPERTOIRES

To a great extent, the communication intervention literature presumes that individuals with developmental disabilities come to the task of learning communication skills as blank slates. Many intervention procedures marginally address strategies for incorporating portions of an individual's existing com-

municative repertoire into intervention activities. A variety of instructional strategies may be chosen, depending on the social acceptability and communicative efficiency of the learner's existing repertoire. Two strategies, shaping and chaining, warrant discussion. In shaping, the interventionist identifies an existing communicative form that is qualitatively unacceptable and, by reinforcing successively better approximations of a more acceptable form, makes the original form more communicatively effective. In chaining, the interventionist takes the learner's existing communicative form and teaches him or her to add a new form to it to enhance communicative efficiency and effectiveness. For example, an individual may produce the manual sign for "hamburger." At McDonald's, however, the sign will not be intelligible to the clerk, but at home, using the sign is far faster and thus more efficient than using a communication board. A chaining procedure might teach the learner to continue to produce the sign. However, if his listener does not respond immediately, the learner would select a graphic symbol that represents "hamburger." In this instance, chaining addresses possible limitations of a single communicative mode. Alternatively, chaining techniques can be implemented to enhance a pragmatic clarity. For example, when a child using a communication board produces single-word utterances, the listener must use significant context to decipher the child's intent. If a child says "milk," only the context in which the utterance is produced allows the interventionist to judge if the utterance was a request or a comment. With some learners, it may be helpful to teach chaining a request descriptor with an object vocabulary item to signify a request (e.g., want + milk = request; milk = comment/provision of information [Reichle & Keogh, 1986]).

In some instances, an individual's communicative expressions are so socially unacceptable that they cannot continue to be a part of his or her communicative repertoire. For example, engaging in aggression to communicate protests is unacceptable. In such instances, it is important that new communicative behavior replace an existing communicative repertoire. Consequently, a socially acceptable form that can become functionally equivalent to the learner's aggression is to eliminate reinforcing contingencies for the aggression and to create numerous opportunities in which a newly identified protesting utterance is reinforced (before it is necessary for the learner to engage in aggression). In this example, unless the interventionist carefully considers the learner's existing communicative repertoire in the design of intervention techniques, it may be virtually impossible to establish generalized use of the new communicative repertoire that is being taught.

It is beyond the scope of this chapter to address comprehensively current best practices aimed at replacing challenging behavior with socially acceptable communicative alternatives. However, there has recently been a growing body of empirical work in this area (see Doss & Reichle, 1989; Reichle & Wacker, in preparation, for comprehensive reviews).

In summary, interventionists must ensure that the design of instructional strategies to establish socially acceptable repertoires of communicative behavior consider an individual's existing repertoire. Once the range of useful social functions has been established, communication intervention strategies must determine whether learners are able to produce sequences of communicative functions in the give-and-take of conversations. Conversely, intervention strategies that begin by emphasizing interpersonal exchanges must also provide strategies to facilitate actual conversational exchanges. Although teaching conversational behavior is not particularly easy, it is a critical skill that allows an individual to be increasingly involved in a full range of community activities.

USING COMMUNICATIVE BEHAVIOR IN ALL PHASES OF SOCIAL INTERACTION

Tannock and Girolametto (1992) observed that, "The precise mechanisms by which early social interaction facilitates language development are not known. . ." (p. 53). Although the precise mechanisms may not be known, current research suggests that there are a number of aspects of listener input that appear to be associated with the acquisition of communicative production. Included among these aspects are: 1) the maintenance of joint attention (e.g., the participants in the interaction are attending to the same aspect of the environment); 2) contingent response to the child's communication (e.g., the partner's response occurs immediately following and is related to the child's communicative attempt); 3) the use of social routines (e.g., interactions that involve joint attention are repetitive, predictable, and provide structure for turn-taking); 4) the use of models and/or expansions (e.g., provision of examples of communicative responses that may or may not build on the content and form of the child's previous communicative response); and 5) the modification of speech to match the complexity of the child's communicative production (Hemmeter, 1991). Given the potential importance and facilitating influence of communicative intervention in the context of conversational exchanges, there is increasing need to identify practical and empirically sound intervention techniques that maximize participation in social exchanges.

Delineating the Components of an Interaction

As we discussed earlier in this chapter, a simple view of social-communicative interactions suggests that there are three broad classes of behavior that may occur in the context of social exchange: social exchanges may be initiated, maintained, or terminated. Most intervention research has focused on teaching individuals to maintain simple interactions. However, the majority of the individual communicative functions discussed in this chapter can be

classified as any one of these three conversational classes of behavior. As mentioned previously, Table 2 illustrates the interaction between communicative intents (request, reject, comment) and communicative exchanges (initiate, maintain, terminate).

Initiating Communicative Interactions

There are many instances when an individual may wish to initiate an interaction with others. Table 3 summarizes some of the circumstances that appear to increase the potential for an initiation to occur. Rarely has initiating communicative interactions been the focus of early intervention efforts for persons who have developmental disabilities. More often, initiation has been addressed once the individual has acquired new vocabulary but has failed to use it spontaneously (Carr & Kologinsky, 1983; Charlop, Schreibman, & Thibodeau, 1985; Gobbi, Cipani, Hudson, & Lapenta-Neudeck, 1986; Simic & Bucher, 1980).

Some promising intervention strategies that can be used to establish communicative initiation have been described. Carr and Kologinsky (1983) explored initiated requests among three learners with autism and who were nonverbal. At the outset of intervention, the learners had repertoires that ranged between 25–50 signs. The authors noted that the learners' requests occurred only in the presence of specific objects. Therefore, the intervention was conducted when objects would be available but not visible. This intervention resulted in an increase in the learners' rates and varieties of initiated requests (Carr & Kologinsky, 1983).

Table 3. Circumstances that may promote initiation of interactions

Circumstance	Example
Joining activities that are already in progress	Tom Sawyer instilling an interest among his peers in painting a fence.
Beginning well-established routines	A learner (taught that you can't eat your snack unless all the children in the group have some), upon receiving several cookies turns to a peer who doesn't have any, offers a cookie, and says, "Here."
Calling attention to novel events	At snacktime when a child spills his milk, a learner obtains the teacher's attention to point out what has happened.
Protesting the undesirable actions of another	A waitress, assuming that a customer has finished his meal, attempts to remove a plate that still contains a small amount of food. When this happens, the customer says, "I'm not done."

From Reichle, J., York, J., and Sigafoos, J. (1991). *Implementing augmentative and alternative communication: Strategies for learners with severe disabilities* (p. 150). Baltimore: Paul H. Brookes Publishing Co.; reprinted by permission.

Halle, Baer, and Spradlin (1981) introduced a time-delay prompt fading procedure to establish initiated requesting by six preschoolers with moderate mental retardation. Teachers were taught to delay 5 seconds before offering assistance or providing materials during activities including free play, snack time, and lunch. A child's failure to respond during a time delay resulted in the interventionist's modeling of a correct response. The child received assistance contingent on a self-initiated utterance or utterance resulting from the interventionist's model. Results demonstrated that the constant time delay was efficient in establishing initiated requests for assistance. Other investigators, including Charlop et al. (1985) and Gobbi et al. (1986), reported the successful use of procedures that incorporated the use of time-delay prompt fading strategies.

Maintaining Communicative Interactions

Conversational maintenance involves a number of interrelated skills that include adding to and introducing new topics to the ongoing conversation, as well as identifying and repairing breakdowns in the communicative flow. Breakdowns occur when one participant in a communicative interaction fails to respond to a partner's utterance that requires a response. For example, suppose that an individual directs the utterance "Do you want to play ball?" to a friend. If the friend fails to say anything, a breakdown has occurred. Similarly, if the friend's response appears to share too little relevant information, a breakdown may occur (e.g., "Do you want to play ball?" to which the partner responds "red one"). Communicative breakdowns may be attributable to sensory impairment, memory deficits, or a number of delayed or disordered aspects of language. Repairing communicative breakdowns is a particularly important area for communication interventionists who work with people who are acquiring an initial communicative repertoire. A growing body of literature suggests that beginning communicators readily identify a subset of their own utterances that have not resulted in efficient communicative exchanges with adult partners. For example, Yoder et al. (1992), based on a study conducted by Gallagher (1981), suggested that children with fewer than 70 words in their repertoire tended to repeat their original utterance when presented with a general query "What," while children with over 90 words in their repertoire tended to revise their original utterance. Other investigators have suggested that children's increasing linguistic competence corresponds to more sophisticated conversational repair strategies (Anselmi, Tomasello, & Acunzo, 1986; Brinton & Fujiki, 1982; Brinton, Fujiki, & Sonnenberg, 1988; Gallagher & Darnton, 1978; Wilcox & Webster, 1980).

In addition to the tendency for a child's repair strategy to vary as a function of communicative ability, there is some evidence to suggest that a listener's request for clarification may also be related to the child's repair strategy (Gallagher, 1981). Gallagher found that parents tend to query

Brown's Stage I children's unclear utterances by asking yes/no questions or general "What" queries. As children's mean length of utterance increases so that they are regularly combining words, adults begin to more explicitly query by specifying particular aspects of messages that they did not understand. Although the assumption appears to be that children's production skills contribute to these modifications in requests for clarification, this is an area that warrants attention in future investigations of conversational repair.

Information regarding the participation of persons with developmental disabilities in repairing communicative breakdowns is quite limited. Coggins and Stoel-Gammon (1982) have reported that 5- and 6-year-old children with Down syndrome responded to nearly all requests for repairs to their communicative responses. Interestingly, the majority of these repairs were revised utterances rather than repetitions of their original utterances. These findings were similar to the results of an earlier study conducted by Gallagher (1977), in which subjects were 18 intellectually normal children, 6 each of Brown's Stage I, II, and III.

To date, there is limited research to suggest that a learner's repair varies as a function of the communicative intent of the utterance for which the repair is requested. Shalz and O'Reilly (1990) found that children were more likely to repair their original utterance when it functioned as a request than when it functioned as a comment. In addition, Wilcox and Webster (1980) found that children would repeat their original utterance when a listener interpreted the utterance as a request and revise their utterance when a listener interpreted the utterance as a comment. Based on this information, it appears that a learner's repair may be affected by: 1) his or her motivation to repair the utterance (e.g., the motivation to repair a request for a desired item may be greater than the motivation to repair a comment regarding the weather), and 2) the listener's inference regarding the communicative intent of the original utterance.

Conversational repair presents a particularly difficult challenge for learners with severe developmental disabilities. Repair persistence involves repeated attempts to repair the same message and may be important for several reasons. First, when a learner has an extremely limited communicative repertoire, the listener may require several opportunities to decipher the message. By being persistent and continuing to respond, the listener has enhanced opportunities to request relevant information. Persistence also affords the listener opportunities to implement mand-model intervention strategies that teach the learner to produce more complete responses to queries for information. Currently, with notable exceptions (Brinton & Fujiki, 1988), there is a lack of empirical information addressing this particularly critical area of repair persistence.

In summary, an individual's ability to maintain an interaction is a critical component of any conversational exchange. Two facets involved in maintaining an interaction are the ability of a speaker to repair breakdowns in commu-

nication and the ability to communicate to a partner that repair is needed. Although empirical research is limited, there appear to be a number of variables that may affect the success of a communicative repair. Among these variables are: the speaker's motivation to repair a misunderstood utterance, the sophistication of the speaker's repertoire, the clarity of the listener's request for repair, and the clarity of the speaker's repair.

Terminating Communicative Interactions

Typically, interventionists have addressed terminating communicative interactions by using situations in which the learner is highly motivated to escape an interaction because it has become uninteresting. Although this motivation may account for a substantial proportion of the termination of interactions, there are a number of other possible circumstances. Table 4 displays circumstances for terminating a conversation, which may have little to do with undesirable aspects of the ongoing interaction. For example, two children may be playing pleasantly during recess. Suddenly, the school bell rings, signaling that recess is over. One child may turn to the other and say, "Oh oh, I've got to go. See you later." In this instance, the communicative interaction ended to accommodate another planned event, not because the interaction had become undesirable. Interventionists must identify a wide array of situations in which to teach a socially acceptable terminating strategy, otherwise it cannot be assumed that the learner will generalize the use of the strategy across the applicable range of situations.

Table 4. Circumstances that may promote termination of interactions

Circumstance	Example
Ending undesired interactions	A learner becomes bored participating in a game of cards and says, "Let's stop."
Concluding desirable interactions in order to accommodate a schedule	When the bell rings in the school cafeteria, a learner may have to terminate his lunchtime interaction with a peer in order to avoid being late to his next class.
Finishing pleasant interactions to take advantage of a more attractive alternative	A 7-year-old child may be content to play with a 3-year-old child provided no other playmates are available. However, the appearance of another 7-year-old may result in the interaction with the 3-year-old being abruptly terminated.
Discontinuing pleasant interactions due to environmental disruptions	A learner who sees his little brother fall off his bike may need to terminate a play activity, in order to render assistance.

From Reichle, J., York, J., and Sigafoos, J. (1991). *Implementing augmentative and alternative communication: Strategies for learners with severe disabilities* (p. 147). Baltimore: Paul H. Brookes Publishing Co.; reprinted by permission.

Few data exist that directly address the issue of best practice in establishing interactive use of communicative behavior. Persons with moderate and severe developmental disabilities are at a potential disadvantage for interactional competence with communicative behavior for several reasons. First, individuals may have a limited interest in other individuals in their environment. Second, people who interact with these individuals may have reduced expectations for communication, and this discourages competent performance (Mittler & Berry, 1977). Third, due to the societal practice of segregation, the number of competent communication partners is drastically limited. Fourth, restricted communicative repertoires are typically associated with individuals with moderate and severe intellectual disabilities. With these disadvantages, interventionists have much to overcome in order to produce successful outcomes.

In many instances, interventionists may impose an instructional rigor that successfully establishes rudimentary conversational behavior, but which is somewhat unsatisfying, because the learner continues to be dependent on the presence of certain discriminative stimuli before he or she engages in conversational exchanges. As a result, the learner's communicative exchanges may lack spontaneity. Consequently, we believe that it is important for interventionists to consider the role of spontaneity in all aspects of establishing conversational sequences.

THE ROLE OF SPONTANEITY IN INITIATING, MAINTAINING, AND TERMINATING CONVERSATIONS

Much of the communivation intervention literature uses the terms intiation and spontaneity interchangeably. We propose that the two are separate phenomena and that each must be addressed if an individual is to fully generalize his or her communicative repertoire. Spontaneous is defined as "arising from internal forces or causes" (*Random House*, p. 844) and initiate as "to begin or set going. . ." (*Random House*, p. 454). Given these definitions, spontaneity can refer to any aspect of a conversation. For example, internal states such as satiation or habituation may motivate an individual to terminate an event. Similarly, internal states such as thirst or hunger may prompt an individual to initiate a trip to a grocery store. Both of these examples constitute spontaneous events. Consider the distinction between spontaneity and initiation in the following example. A child visiting the local playground for the first time looks at a group of children who are about the same age. First, the child's parent says, "Look, kids to play with!" However, the child fails to act on the opportunity. The parent follows up with, "Why don't you walk over?" The reluctant child continues to ignore the parent's prompts. Finally, the parent says, "Go on over." The child responds, "No." As a last resort the parent

says, "If you don't walk over, we're going home and you can do your homework." The threat of negative reinforcement prompts the child to walk over and awkwardly say, "Hi." Although the child's utterance was a conversational initiation, because it was heavily prompted by the parent, it is not considered spontaneous. If initiation and spontaneity are treated as the same skill, learners may fail to receive intervention directed to their conversational needs.

Although it clearly applies, interventionists rarely consider instructional objectives that focus on the extension of spontaneity to maintain or terminate conversational flow. For example, consider an elementary-school student who is conversing with a classmate in the lunch room of an elementary school. Midway through the conversation, a bell signals the end of the lunch period in 2 minutes. Learners who lack spontaneity may fail to conclude the interaction (e.g., "Well, I guess we better go") until the communicative partner asks, "Do you have to go?" At this point, both participants in the interaction rise and depart without actually concluding the interaction.

While we have provided examples of spontaneous and prompted initiations and terminations, spontaneity in maintaining conversations is not easily delineated. Topic changes might be interpreted as an example of spontaneity in conversation maintenance. If, however, the topic change is unrelated to prior content, the listener may not follow the flow or understand the transition. This outcome might indicate the speaker was, in effect, "too spontaneous." The lack of spontaneity in the communicative behaviors of persons with developmental disabilities represents a critical area for further empirical scrutiny. Too often, instructional opportunities focus on opportunities for learners to maintain communicative interaction rather than on opportunities to initiate or terminate interactions. When there are opportunities across the three components of an interaction, it is often instructionally convenient to select a narrow range of teaching examples (i.e., teaching termination of interactions only when the interaction becomes a nonpreferred activity). Care must be taken to focus on the full range of opportunities available for communicative interaction so that persons with developmental disabilities are not at an extreme disadvantage when participating in classroom and community environments.

ENSURING CORRESPONDENCE BETWEEN THE LEARNER'S COMMUNICATIVE UTTERANCES AND ACTIONS

Toddlers' initial utterances usually have referents that are both present and visible. As children mature, they begin to talk about referents that are not present in space and time. To have a wide range of potential conversational topics, an individual should be able to refer to referents and actions that have occurred in the past and that may occur in the future. A number of investiga-

tions have examined the correspondence between an individual's communicative productions and actions (Baer, 1990; Baer, Blount, Detrich, & Stokes, 1987; Baer & Detrich, 1990; Baer, Detrich, & Weninger, 1988; Baer, Osnes, & Stokes, 1983; Baer, Williams, Osnes, & Stokes, 1985; Crouch, Rusch, & Karlan, 1984; Deacon & Konarski, 1987; de Freitas Ribiero, 1989; Guevremont, Osnes, & Stokes, 1986a, 1986b; Guevremont, Osnes, & Stokes, 1988a, 1988b; Israel, 1978; Israel & Brown, 1977; Israel & O'Leary, 1973; Karlan & Rusch, 1982; Paniagua, 1989; Paniagua & Baer, 1988; Risley & Hart, 1968; Rogers-Warren & Baer, 1976; and numerous others).

Risley and Hart (1968) attempted to increase the correspondence between disadvantaged preschoolers' self-reports and actual behaviors in two separate situations. In the first situation, a "say-do" pattern, the child first gave a verbal description of what he or she planned to do (e.g., named the toy that he or she was going to play with), and then had the opportunity to engage in a range of activities that included the activity that was the focus of the child's preceding utterance. In the second situation, the "do-say" pattern, the child first engaged in an activity (e.g., played with a particular toy), and then had the opportunity to verbally describe what he or she did. Baseline data revealed that correspondence between the verbal self-report of actions and the actual actions was low regardless of the situation (e.g., "do-say" or "say-do"). However, delivery of a reinforcer contingent on correspondence resulted in an increase in correspondence between verbal self-reports and actual behaviors in both situations. A number of investigations have corroborated the findings of Risley and Hart (1968) in the say-do situation (Baer et al., 1987; Baer et al., 1988; Guevremont, Osnes, & Stokes, 1986a, 1986b; Israel & Brown, 1977), as well as the do-say situation (Israel, 1973; Karoly & Dirks, 1977; Rogers-Warren & Baer, 1976). These results suggest that although individuals may have sufficient vocabulary to produce verbal self-reports about the activities in which they engage, a correspondence between the two may not necessarily occur unless their relationship is consistently reinforced.

In many instances, there may be limited natural contingencies that reinforce children for matching their communicative behaviors with their actions (Tetlie & Reichle, 1986). For example, when a child comes home from preschool and a parent asks, "What did you do today?", it is quite probable that the adult cannot accurately ascertain if the child's report corresponds with the child's actions. It is unlikely that the adult actually knows what the child did. If the adult producing the query is not able to discriminate a correct response from an incorrect response, any plausible answer must be treated as a corresponding utterance. For a learner with a limited communicative repertoire who is engaged in a reinforcing activity when queried, a vague response using well-rehearsed vocabulary is often given. For example, when asked, "What did you do today?", a learner may respond, "We played." If the

learner's communicative partner follows with, "What did you play?", the learner may respond by saying "stuff" or "toys." Using well-rehearsed and easy-to-produce vocabulary that marginally match the query may be viewed by the learner as the most efficient method of satisfying the communication partner without having to divert attention from an ongoing activity.

Little research has focused on reasons for a lack of correspondence between communicative behavior and actions in children with developmental disabilities. One obvious explanation is that the learner may not have sufficient vocabulary to describe activities. If a learner is asked, "What did you do today?", but he or she does not have the vocabulary to adequately respond, specific correspondence between behavior and report is unlikely. The smaller the child's vocabulary, the more challenging it will be for the child to produce an utterance that directly matches his or her actions. Learners may resort to one of several strategies to accommodate an insufficient vocabulary, including offering a very general or vague response.

Some learners may fail to correspond their actions with spoken utterances in an effort to maintain an interaction. Learners may acquire routinized stories that they use as a script (e.g., I went fishing today → caught a big one → 15 pounds). Over time, the individual may have learned that a particular utterance or sequence of utterances probably yields not only a listener response, but also continued interaction. Because the learner uses the utterances or sequences of utterances so often, production of these has become a relatively effortless strategy to maintain an interaction.

Another plausible explanation for failure to produce verbal behavior that corresponds to actions is the possibility of a memory deficit. For some learners, correspondence may be jeopardized if significant time passes between engagement in an action and a communicative utterance. Although it is beyond the scope of this chapter, the relationship between memory and language use represents a critical area for investigation with individuals who have developmental disabilities.

In summary, one of the basic conditions of an efficient communicative exchange is that both participants produce truthful and relevant utterances. The available literature suggests that correspondence between learners' actions and communicative utterances does not always occur. There appear to be a number of plausible explanations for this lack of correspondence. Communication interventionists need to consider the extent to which a learner's communicative behavior accurately represents the displaced events to which the learner is referring. There is a critical need for development and systematic evaluation of intervention strategies that focus on ensuring correspondence between actions and communicative utterances. Unless such correspondence exists, it is difficult to improve the quality of social exchanges in which an individual participates.

SUMMARY

In this chapter, we have reviewed a number of factors to consider when establishing an initial repertoire of communication skills with learners who have moderate and severe developmental disabilities. The complexity and magnitude of the task is striking. Communication is among the most complex elements of human behavior. Consequently, it represents a significant challenge to interventionists who are attempting to establish an initial communicative repertoire with individuals who are not acquiring an initial repertoire at a satisfactory rate.

Communicative functions (e.g., request, protest, provide information) are produced under varying stimulus conditions. Interventionists cannot assume that newly acquired forms expressing specific communicative functions will be used across a large array of occasions unless the range of these occasions is reflected in the intervention procedures. Establishing generalized use of a variety of communicative functions is further complicated by potential confusion in their discriminability. It is quite easy to define instances of requesting that are maximally discriminable from rejecting. In other instances, the distinction between these two functions may be quite unclear. The difference in discriminative stimuli that call for a request for an alternative versus a rejection may be very subtle. Consequently, the interventionist must carefully select examples to teach discrimination between, and generalization across, communicative functions.

A particular confusion regarding examples for teaching communicative functions occurs when interventionists do not differentiate the pragmatic form of an utterance from its pragmatic function. That is, if "requesting assistance" has been targeted for intervention, selection of teaching examples could focus on using this behavior to hasten completion of less desirable activities (i.e., "Help me sweep the floor") or to more quickly access desired items or events (i.e., "Help me unwrap this candy"). The interventionist must be cognizant of the exact function that the communicative behavior being taught is serving.

Inherent in the interventionist's establishment of communicative production is the goal of placing the most sophisticated forms within the learner's grasp. That is, moving from one-word to two-word utterances as quickly as possible has been a component of most early communication intervention programs. Although, in general, the more sophisticated the communicative form, the more appealing it is to the listener, there may be important exceptions. Efficient and socially acceptable utterances may be very simple. For example, natural gestures such as pointing in the presence of referents may be highly communicative and socially acceptable. The existence of rudimentary but very engaging forms may cause the interventionist to reconsider the priority of some of the communicative forms targeted for intervention.

Once a beginning repertoire of social-communicative functions and a corresponding vocabulary has been established, interventionists must address the use of those skills across sequences of interactive exchanges with others. Variables directly influencing the range of conversational options, from either the speaker's or listener's perspective, have yet to be elaborated exhaustively.

Although tremendous progress has been made in the delineation of viable communication intervention strategies for individuals with developmental disabilities, much work remains. As our understanding of the variables that influence the acquisition of communicative behavior increases, the sophistication of intervention strategies also increases. The field of communication intervention has advanced rapidly and we are confident that it will continue. For this reason, it is very important to validate empirically the strategies that emerge. If we fail to do so, we run the risk that we will speed in directions that, in the final analysis, will be counterproductive to the advancement of communication intervention expertise. Consequently, good collaborative relationships between researchers and practitioners are more important than ever.

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