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## APPENDIX B

## Scale of listener experience

## "Inexperienced"

1. Has never heard a deaf person speak.
2. Has heard a deaf person speak at some time, e.g., someone who recalls having heard a deaf person speak once or twice sometime in the past.
3. Occasional past experience with hearing the deaf, e.g., someone who had occasional contact with a hearing-impaired neighbor sometime in the past.

4. Occasional past and current contact with deaf talkers, e.g., a graduate student who occasionally encounters hearing-impaired persons.

## "Experienced"

5. Daily past and current contact with deaf talkers, e.g., a beginning audiologist or a training teacher.
6. Extensive past and current experience with the deaf, e.g., an audiologist at a school for the deaf.
7. Teacher of the deaf.
8. Spouse, child, or parent of a deaf talker.

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## LANGUAGE ACQUISITION AND COMMUNICATIVE BEHAVIOR IN AUTISM: TOWARD AN UNDERSTANDING OF THE "WHOLE" OF IT

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Deviant language characteristics, deficits in social interaction, and ritualistic and compulsive behaviors are now considered to be among the definitive characteristics of the autistic syndrome. There have been few attempts to bring a sense of cohesion to the varied communicative symptomatology evident in autism, because much of the research literature has been product oriented rather than process oriented, and has focused on language structure rather than function. Therefore, behaviors such as immediate echolalia, delayed echolalia, and interactive rituals are often viewed as isolated, deviant phenomena, rather than as phenomena related to predominant cognitive processing modes and cognitive-linguistic development in autism. This discussion reviews symptomatology of autistic communication in reference to "gestalt" versus "analytic" modes of cognitive processing, language acquisition, and language use. Based on research on language behavior of normal and autistic children, specific issues are considered, including a reconsideration of echolalic behaviors, patterns of social interaction, and patterns of cognitive-linguistic development in autism.

There is general agreement among researchers that deficits in communication and social interaction are an integral part of the autistic syndrome (DeMyer, Jackson, & Hingtgen, 1981). Leo Kanner's earliest and most vivid descriptions of the unique behavior of his autistic clients were concerned primarily with patterns of communicative and interactive behavior (Kanner, 1943, 1946). Although researchers have since had a "heyday" in studying language and communication of autistic persons, the lack of a cohesive theory of language acquisition and communicative behavior in autism is striking. The absence of such a theory may be attributed, in part, to a research philosophy which has been preoccupied with communicative deficits and deviance, rather than strategies and processes which may underlie patterns of communicative behavior. Furthermore, there have been too few attempts to consider the interrelations between communicative and cognitive functioning in autism.

Due to this research tradition, we know very well what autistic persons don't do in their communicative attempts; and we also know, to a lesser extent, what they do differently from normals. The latter has been de-

scribed as so idiosyncratic that the terms *bizarre* and *deviant* have become intimately associated with a description of autistic communication. The problem, which has apparently eluded the attention and concern of many researchers, is that a "deficit-checklist" orientation hasn't taken us very far in understanding communicative behavior of autistic persons or in planning intervention programs. Another unfortunate result is that checklists of deficits come to resemble shopping lists for diagnosis without helping professionals to understand how symptoms may be understood in relation to each other, thus offering a more cohesive orientation to communication problems.

This discussion focuses on patterns of language and communicative behavior in autism in an attempt to explain how frequently cited symptomatology may be understood in reference to how autistic persons may conceptualize and attempt to participate in the communication process.

This task is approached by first discussing common approaches to the study of autism, followed by a review of frequently cited language and communication charac-

teristics. Finally, a framework for a potentially more fruitful orientation toward an understanding of language and communication in autism is offered by relating communicative abilities and disabilities in autism to a predominant cognitive and linguistic processing mode, which has been referred to as "gestalt" (vs. "analytic"). Since patterns of language and communicative behavior are the focus of discussion, comments pertain to autistic individuals who have acquired some speech, whether it be echolalic or truly rule-governed language. This group comprises approximately 50% of persons with autism who, in general, represent a range of cognitive functioning from moderate-to-severe retardation to normal or above normal functioning. The following discussion is presented as a stimulus for further research and hypothesizing and as an aid to clinicians who must attempt to understand the behavior of their autistic clients. The following ideas are by no means complete or irrefutable. As such, they should be regarded as "working arguments."

#### *Common Approaches to the Study of Language and Communicative Behavior in Autism*

Research on deficits in language and communication in autism has clearly confirmed the centrality of such deficits to the syndrome (Fay & Schuler, 1980; Prizant, 1982b). This is, of course, of little surprise since a diagnosis of autism is predicated on the identification of such deficits (Rutter, 1978). Researchers have sought to clarify which deficits are most specific to autism (Needleman, Ritvo, & Freeman, 1980; Wing & Gould, 1979) and which domains of language functioning tend to be the most severely impaired. For example, based on her review of language research, Tager-Flusberg (1981) claimed that the basic disturbances of language in autism are most evident at semantic and pragmatic levels, with phonological and syntactic skills being somewhat delayed but relatively intact. The literature on higher functioning autistic persons emphasizes deficits in communicative abilities that may remain strikingly apparent long after the acquisition of relatively sophisticated semantic-syntactic abilities (Baltaxe, 1977). Thus, descriptions of language and communication in autism are most often characterized by lists of symptoms that are labels for behavioral deficits or labels for behaviors that appear to be somewhat unique to the autistic syndrome, that is, so-called deviant behaviors. Such lists are comprised of many language-related "symptoms," such as immediate echolalia, delayed echolalia, and pronominal reversal. Frequently cited characteristics of discourse and social interactive behavior include excessively rigid interactive routines, problems in initiating and terminating interaction, deficits in topic maintenance, topic shifting, and perception of listener needs (Fay & Schuler, 1980).

One other approach relevant to communication research in autism might be called the "primary deficit debates" in which researchers and theorists attempt to

identify a specific type of dysfunction as primary, in the sense that all other symptomatology is seen as secondary effects of the primary dysfunction. One of the most controversial primary deficit arguments was posited by Bettelheim (1967), who claimed that the symptoms of withdrawal and deviant language behavior were a result of a child's view of the world as hostile and threatening. Within this psychogenic theory, autism was considered to be a reaction to pathological maternal behavior. With increasing evidence of neurophysiological involvement (see Piggot, 1979, for a review) and rejection of psychogenesis, debates have shifted to neurobiological issues, such as site of dysfunction or damage, or to issues concerning dysfunction at various levels of information processing, such as deficits of perceptual-motor functioning or cognitive functioning. Of particular interest to researchers in language disorders are primary deficit theories that implicate communication deficits and problems in language and language-related cognitive abilities (Churchill, 1978; Hermelin, 1976; Ricks & Wing, 1975; Rutter, 1978). Discussions concerning the primacy of language problems to the syndrome of autism have been, and no doubt will continue to be, prevalent (Boucher, 1976).

Before presenting an alternative approach to understanding language and communication of autistic persons, a brief review of commonly cited symptomatology is in order.

#### *Commonly Cited Characteristics of Language and Communication in Autism*

Echolalic behaviors are probably the most frequently discussed speech and language characteristics, most likely due to their high prevalence among verbal autistic persons, as well as their "ear-catching" quality. Such verbal repetition is characteristic of at least 75% of verbal autistic persons and is comprised of a continuum of behaviors which may vary in many aspects (Prizant, 1983; Schuler, 1979; Prizant, Note 1). The clearest distinction that has been made differentiates two general categories of echolalic behavior based on the temporal latency between the original production of an utterance and its subsequent repetition.

The first category, *immediate echolalia*, refers to utterances produced either immediately following or a brief time after the production of a model utterance. *Delayed echolalia* refers to utterances repeated at a significantly later time. The process involved with the production of delayed echolalia involves retrieval of utterances committed to some type of long-term memory, while for immediate echolalia, short-term echoic memory is most often implicated (Fay, 1983). As Fay and Schuler (1980) pointed out, the differences between immediate and delayed echolalia may warrant a reconsideration of their common label.

More specifically, immediate echolalia has been defined as "the meaningless repetition of a word or word group just spoken by another person" (Fay & Schuler,

1980, p. 25). The consensus of most theorists and researchers has been that the production of immediate echolalia signals a lack of comprehension of the repeated utterance and is devoid of communicative intent (Schreibman & Carr, 1978). However, explanations of immediate echolalia as a coping strategy or as a primitive attempt to maintain social interaction have appeared recently in the literature (See Prizant, 1983, and Schuler, 1979, for reviews). Kanner (1943) described one type of immediate echolalia which he claimed served the specific function of affirming the prior utterance. The only published study which has attempted to discover other functions of immediate echolalia was conducted by Prizant and Duchan (1981). Based upon videotape analyses of 1009 echoic utterances of four autistic children, seven functional categories of immediate echolalia were derived (see Table 1). Echoic utterances were found to vary along the dimensions of interactiveness and comprehension of the model utterance. A major finding based upon these analyses was that immediate echolalia was often produced with clear evidence of communicative intent.

TABLE 1. Functional categories of immediate echolalia (Prizant & Duchan, 1981).

Category	Description
<b>Interactive</b>	
1. Turn taking	1. Utterances used as turn fillers in an alternating verbal exchange.
2. Declarative	2. Utterances labeling objects, actions, or location (accompanied by demonstrative gestures).
3. Yes answer	3. Utterances used to indicate affirmation of prior utterance.
4. Request	4. Utterances used to request objects or others' actions. Usually involves mitigated echolalia.
<b>Noninteractive</b>	
5. Nonfocused	5. Utterances produced with no apparent intent and often in states of high arousal (e.g., fear, pain).
6. Rehearsal	6. Utterances used as a processing aid, followed by utterance or action indicating comprehension of echoed utterance.
7. Self-regulatory	7. Utterances which serve to regulate one's own actions. Produced in synchrony with motor activity.

Delayed echolalia, which has been defined as the "echoing of a phrase after some delay or lapse of time" (Simon, 1975, p. 1440) has also received very little attention in reference to its value and possible function in the communicative process. This is supported by the fact that research has considered most forms of delayed echolalia to be meaningless, produced without intent, and simply "triggered" by stimuli which were either present or associated with stimuli which were present when an utterance was first heard. Utterances such as

repetitions of parental reprimands and TV commercials are often cited as examples.

However, specific functional usage of delayed echolalia has also been alluded to in the literature. For example, Wolff and Chess (1965) described two categories of delayed echolalia, "noncommunicative repetition" and "communicative repetition." Ricks and Wing (1975) discussed the appropriate use of phrases that a child copies from others, such as "Do you want a biscuit?" used as a request, and Dyer and Hadden (1981) also speculated that delayed echolalia may serve a variety of functions. Videotape analyses of almost 400 delayed echoic utterances and co-occurring nonverbal behaviors recently revealed 14 functional categories of delayed echolalia (see Table 2). Individual differences in patterns of functional usage were far more striking for the subjects in the delayed echolalia study when compared to the patterns of usage for the subjects in the immediate echolalia study

TABLE 2. Functional categories of delayed echolalia (Prizant & Rydell, Note 2).

Category	Description
<b>Interactive</b>	
1. Turn taking	1. Utterances used as turn fillers in alternating verbal exchange.
2. Verbal completion	2. Utterances which complete familiar verbal routines initiated by others.
3. Providing information	3. Utterances offering new information not apparent from situational context (may be initiated or respondent).
4. Labeling (interactive)	4. Utterances labeling objects or actions in environment.
5. Protest	5. Utterances protesting actions of others. May be used to prohibit others' actions.
6. Request	6. Utterances used to request objects.
7. Calling	7. Utterances used to call attention to oneself or to establish/maintain interaction.
8. Affirmation	8. Utterances used to indicate affirmation of previous utterance.
9. Directive	9. Utterances (often imperatives) used to direct others' actions.
<b>Noninteractive</b>	
10. Nonfocused	10. Utterances with no apparent communicative intent or relevance to the situational context. May be self-stimulatory.
11. Situation association	11. Utterances with no apparent communicative intent which appear to be triggered by an object, person, situation, or activity.
12. Self-directive	12. Utterances which serve to regulate one's own actions. Produced in synchrony with motor activity.
13. Rehearsal	13. Utterances produced with low volume followed by louder interactive production. Appears to be practice for subsequent production.
14. Label (noninteractive)	14. Utterances labeling objects or actions in environment with no apparent communicative intent. May be a form of practice for learning language.

(see Prizant, 1983, and Prizant & Rydell, Note 2, for details). As with the study on immediate echolalia, delayed echolalia was often found to be produced with clear evidence of communicative intent.

In summary, theories about the relationship between communicative intent and echolalia produced by autistic persons are being reevaluated. Until recently, the predominant position was that echoic utterances are produced automatically with little or no communicative intent, as opposed to utterances which are more creative and are thus believed to be produced with communicative intent. Figure 1 depicts this position, which considers form (i.e., echolalic or creative) to be a direct reflection of the presence or absence of communicative intent.

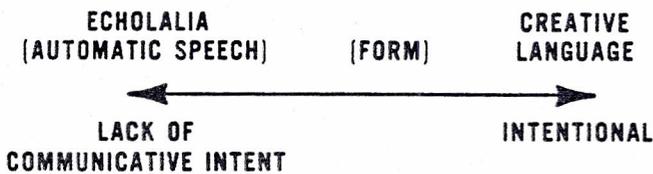


FIGURE 1. Underlying intent linked to form.

In contrast, recent research and theory (Fay & Schuler, 1980; Prizant & Duchan, 1981; Schuler, 1979; Prizant & Rydell, Note 2) suggest that some forms of echoic utterances may be produced with intent; that is, the utterances are produced as a means to an end or for the purpose of accomplishing some goal (e.g., requesting objects, directing others' behavior, labeling, etc.) Figure 2 represents this position, which postulates that form cannot always be used as an indicator of the presence or absence of communicative intent. It is possible that, due to specific linguistic deficits, autistic persons must often rely on utterances "borrowed" from others in order to express their needs and intentions, even though the internal structure (i.e., semantic-syntactic relationships) of such utterances may not be analyzed or fully comprehended.

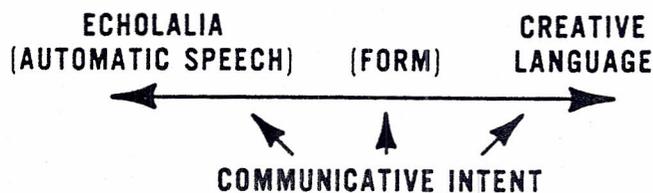


FIGURE 2. Underlying intent independent of form.

Limitations in communicative skills have also been widely discussed in the literature on autism (Fay & Schuler, 1980). The stereotype of an autistic child has traditionally been that of a noninteractive entity who is in a "world of his own." While this global statement holds little truth (Prizant, 1982b), it is true that the social interactive behaviors of autistic persons are often not conducive to successful communication. For example,

autistic persons often develop highly specific routines and rituals when interacting with other people which may include opening all conversations in the same manner or asking others a predetermined set of questions (e.g., birthdates, favorite ball teams, etc.). Specific routines may be developed with select individuals, while interactions with others are avoided. Once a routine is established, it is not uncommon for autistic persons to demand specific responses from others to preserve the ritual. Disruptive, aggressive behavior, possibly resulting from anxiety or confusion, may result from violation of routines. Such "insistence on sameness" (Kanner, 1943; Rutter, 1978) is basic to the autistic syndrome and is manifest in communicative behavior as well as all other aspects of functioning. Regarding discourse and social interaction, it appears that autistic persons often initiate interaction motivated largely by the need to ensure predictability by maintaining an established routine. Other symptomatology indicative of interactive inflexibility includes incessant questioning, preoccupation with specific topics, an inability to shift topics, and poor perception of listener needs (presuppositional skills).

The impression one gets from such problems in social interaction is that autistic persons are deficient in many of the basic skills we must acquire in order to be effective communicators. What is so painfully evident about higher functioning autistic persons is that if we consider their linguistic skills alone, it seems as if they should be much better communicators than they are. For many autistic persons, the problem is clearly one of using language skills for communicative purposes rather than simply acquiring such skills.

As mentioned, the notion that deficits of language and communication are not simply isolated features of autism will now be considered. They could be understood by reference to an extreme form of cognitive processing which may be the predominant mode available to persons with autism. Furthermore, it is argued that such a "gestalt" processing mode can help to explain strategies of language acquisition and patterns of social interaction in autism.

#### *Gestalt Forms and Gestalt Styles of Language Acquisition*

In the following discussion, references are made to *gestalt forms* in language, a *gestalt style* of language acquisition, and a *gestalt mode* of cognitive processing. A few points of clarification are needed to distinguish among these three concepts. First of all, *gestalt language forms* refer to multiword utterances that are learned as memorized forms or whole units but may appear to be the result of productive linguistic processes or the application of combinatorial rules. Presumably, a speaker who uses such forms is not cognizant of their internal semantic-syntactic structure. Secondly, a *gestalt style* of language acquisition is one in which early utterances are comprised largely of gestalt forms, and growth and prog-

ress in the acquisition of a flexible and generative language system depends, to some extent, on analysis and segmentation of gestalt forms for rule induction. Researchers who have described gestalt language acquisition styles (Nelson, 1981; Peters, 1980) have not established quantitative criteria for identifying gestalt styles (e.g., a necessary minimum percentage of gestalt forms relative to total utterance production). Rather, they have proposed a continuum of style ranging from predominantly gestalt to purely analytic approaches in the language acquisition process. Their arguments are considered in greater detail later in the discussion. Finally, a *gestalt mode* of cognitive processing is one in which events are remembered or retained with relatively little analysis. Linguistic utterances may or may not be part of such events. A gestalt mode must be viewed in contrast to an analytic mode in which experiences or events are analyzed and segmented into meaningful components based upon prior experience. In an analytic mode, irrelevancies or redundancies are given little attention while new or significant information is abstracted.

For the purposes of this discussion the gestalt/analytic processing distinction is considered analogous to the distinction between the concepts of episodic memory and semantic memory processing cited often in the literature on memory in normal children and adults. Naus and Halasz (1979) noted that episodic memory is "the memory of specific occurrences or events" (p. 280) and that such information "will not be semantically organized when entered into long-term memory" (p. 282). Hubbell (1981) explained that "in episodic memory an item is remembered as a whole, with little analysis of its component parts and structure" (p. 29). Nelson and Brown (1978) indicated that episodic memory may also entail "the information of generalized event structures . . . representing similar repetitive experiences or routines" (p. 240). Retrieval of information from episodic memory involves retrieval of events themselves, as experienced within specific contexts, or knowledge about highly repetitive or routinized activity.

In contrast, semantic memory involves higher levels of abstraction in which knowledge is stored "independent of any specific event" (Hubbell, 1981, p. 28). That is, semantic memory involves information abstracted from experiences which is organized conceptually for long-term retention. In normal adults and older children, such information is believed to be represented symbolically through language, leading some researchers to limit their definition of semantic memory to "information about words and concepts represented in language" (Nelson & Brown, 1978, p. 240). Retrieval of information from semantic memory involves "a reconstruction of the event, focusing on the gist of that event, rather than a wholistic copy, as in episodic memory" (Hubbell, 1981, p. 29). As with the concepts of gestalt and analytic processing, episodic and semantic memory do not represent a clear-cut dichotomy. A continuum is suggested, ranging from the internal representation of context-specific events (i.e., gestalt, episodic representation) to decontextualized generalized knowledge (i.e., abstract symbolic

representation). Hubbell (1981) indicated that in normals, both episodic and semantic memory processing may occur; however, he added that "language use and language learning are not based on episodic memory, the retention of specific utterances, but on semantic memory. . . . [and that] to learn language a child must be able to reconstruct sentences, not merely recite them" (p. 29).

With these distinctions in mind, the discussion now shifts to literature on language acquisition in normal first and second language learners, followed by a discussion of patterns of language forms, social interaction, and language acquisition in autism. Finally, the literature on nonverbal cognitive functioning in autism, which has delineated particular idiosyncratic learning patterns in the autistic population, is reviewed.

### *Language Use in Normal Children*

Katherine Nelson (1981) discussed the two predominant styles of acquisition in her recent literature review on individual differences in the language development of normal children. The first style, referred to as "analytic" (Peters, 1977), is one in which children in early stages of language development emphasize single words for primarily referential functions and acquire more complex language by combining elements into multiword utterances based upon the acquisition and application of productive rules. An analytic style, which until recently was believed to be the style of most if not all normal children, is thus characterized by flexible and generative utterance production with an understanding of the meaning and internal structure of utterances from early on.

A gestalt style of language acquisition is one in which children produce unanalyzed language forms or unanalyzed "chunks" with little appreciation of their internal structure or specific meaning, although the utterances may be used somewhat appropriately in communicative interactions (Clark, 1974, 1978; Peters, 1980). Gestalt and analytic styles are not necessarily mutually exclusive and are considered to be extreme ends of a continuum. In fact, both Nelson and Peters pointed out that normal children may show elements of each style to varying degrees.

Other researchers of normal language acquisition have made similar distinctions among styles in language behavior. Dore (1974) indicated that "word babies" focused on the production of clearly articulated single words used in referential contexts in early acquisition. "Intonation babies," however, seemed to target longer utterances in early productions by focusing on intonation contour with less well-articulated segmentals. For the latter group, it may appear as if their utterances are more grammatically sophisticated, however, they are not produced with knowledge of internal structure or meaning. Rather, "intonation babies" only sound as if they are talking in phrases or sentences. Nelson (1973) made a similar distinction between "referential" and "expressive" children in her longitudinal study of 18 normal

children in early stages of language acquisition. The majority of the children first acquired object names, as well as action words (verbs) and some adjectives, in single-word productions ("referential children"). The remaining children produced grammatical functors as well as content words, and their early utterances included many unanalyzed routines used for social interaction rather than for referential purposes ("expressive children"). Nelson (1981) indicated that differences between referential and expressive children may be attributed to the language that the children were exposed to, as well as to different modes of cognitive processing. She drew direct analogies between referential children and analytic processing preferences, as well as between expressive children and gestalt processing styles.

Clark (1974, 1978, 1980), Peters (1977, 1980), and Snow (Note 3) discussed normal children's use of unanalyzed chunks or deferred imitations which were far more sophisticated grammatically than their subjects' true language levels. These authors claimed that the use of such forms served important functions in ongoing interactions as well as in the language acquisition process. Peters (1980) suggested that unanalyzed forms may actually be perceived as single units when first heard and may subsequently be used somewhat appropriately in contexts similar to the ones in which they were originally heard, thus giving the appearance of a linguistic system of greater complexity than is actually the case. As is discussed later in greater depth, the claims of Clark, Peters, and Snow are strikingly similar to those of Baltaxe and Simmons (1977), Prizant (1982a, Note 1), and Prizant and Rydell (Note 2) in their research on echolalic patterns of autistic persons.

Another source of information on gestalt style and gestalt forms in language acquisition is literature on second-language acquisition. Fillmore (1979) conducted a longitudinal study on second-language acquisition of five Spanish-speaking children learning English who approached the task through a number of "social strategies" and "cognitive strategies." She found that a major social strategy consisted of a child attempting to participate in social discourse by producing formulaic or memorized unanalyzed utterances which allowed the child to use "the language long before he knows anything about its structure, and before he can create any sentences in the language himself" (p. 211). She indicated that utterances were often used in somewhat appropriate contexts because they were associated with particular activities or routines. Fillmore added that "the strategy of acquiring formulaic speech is central to the learning of language" (p. 212). As is proposed shortly, this strategy may also be the primary means by which autistic persons approach the language acquisition process. It may very well be that formulaic utterances or gestalt forms result, in part, from abilities in rote memory and motor proficiency which exceed linguistic comprehension and productive linguistic abilities. Autistic children and older normal children learning a second language would seem to have such abilities in common. However, normal children learning a second language

may choose to adopt such a strategy, while autistic children may be limited to this type of strategy.

Krashen and Scarcella (1978) also described strategies of language acquisition and use employed by normal first- and second-language learners. The authors discussed the use of two types of linguistic patterns: *prefabricated routines*, i.e., memorized whole utterances or phrases which a speaker may use "without any knowledge at all of their internal structure" (p. 283); and *prefabricated patterns* which are "partly creative and partly memorized wholes," such as memorized "sentence frames with an open 'slot' for a word or a phrase" (p. 283), (e.g., *I want \_\_\_\_\_*; *This is a \_\_\_\_\_*). Prefabricated routines and prefabricated patterns appear to resemble delayed echolalia and mitigated delayed echolalia, respectively.

In summary, researchers who study gestalt styles and gestalt language forms in normal children acquiring first and second languages consider such patterns to be important, if not essential, to language acquisition and social interactive growth. They have demonstrated that the use of gestalt forms (or formulaic utterances, unanalyzed chunks, prefabricated routines) are not only instrumental to a child's participation in social interaction, but also that they help to provide children with a foundation and framework for developing more complex communicative skills. Research on gestalt forms and gestalt styles of normal children may provide us with some basis for understanding similar forms and styles of autistic persons. Thus, frequently noted characteristics/deficits of communicative behavior in autism will now be reconsidered in light of the previous discussion on gestalt forms and gestalt style. In concluding, this information is brought to bear on hypotheses about how persons with autism may acquire language and how their language form and use may relate to their mode of cognitive processing.

### *Gestalt Patterns in Autistic Communication*

As discussed earlier, language patterns such as immediate and delayed echolalia, and interactive inflexibility are the most striking and prevalent features of communication of verbal autistic persons. Each of these characteristics can be better understood as manifestations of gestalt processing.

A child who demonstrates immediate echolalia seems to be treating each repeated utterance as a unit due to a lack of appreciation of its internal constituent structure (Fay, 1983). Even if a child demonstrates some comprehension of an utterance he or she echoes [possibly due to recognition of lexical item(s)], such understanding is extremely limited (Prizant & Duchan, 1981). The child's major strategy seems to be to repeat utterances that are beyond his or her processing capacities, even though parts of the utterance may be recognized. This is best achieved by a reproduction of the whole acoustic form, or the last "section" of a form, depending upon short-term memory limitations (Fay, 1983). As more ele-

ments and grammatical relationships are recognizable, allowing for greater processing, (a) rule-governed changes may be imposed in repetition resulting in mitigated echolalia, or (b) echoing may not occur at all if the child can respond appropriately (Prizant, Note 1). [In this context, it is interesting to note that imitative behavior has been associated with gestalt or wholistic modes of processing (Bates, 1979).]

Delayed echolalia is exemplary of gestalt processing because it seems to be an effort to bring forth whole forms that were heard previously in similar situations. The similarity may be due to associations based on environmental features (e.g., an utterance is associated with a particular person or place), on internal states (e.g., an utterance is associated with anger, happiness, or thoughts of past experiences), or on experiences of particular sensations (e.g., an utterance is associated with pain or extreme temperature). Those who work and live with persons who produce delayed echolalia often become engrossed with discovering the connection between a delayed echoic utterance and the situation at hand, and, thus, its "meaning" to a particular child, which may be indecipherable at some times but transparent at others.

Delayed echoic patterns may be manifestations of gestalt processing at both situational and linguistic levels. First, multiword utterances may be produced as whole units, with little if any knowledge or understanding of their internal structure. Second, such unanalyzed units may be produced as a partial fulfillment of a situational gestalt in which a child attempts to replicate a previous situation (Prizant, 1982a). Instead of utterances referring to prior events, delayed echolalia seems to be a reproduction of portions of events themselves that were retained in episodic memory.

Recently, I have had the opportunity to observe what might be an example of a gestalt style of recalling previous experiences. I returned to visit some young autistic children I had worked with for more than a year but hadn't seen for almost 4 years. One child (who was 5 years old when I worked with him, and 9 years old upon my return visit), began to reproduce segments of conversation that were parts of events which had occurred 4 years earlier. When I asked him if he remembered some of the things we had done, he continued to offer "pieces" of events by recalling segments of dialogue. (Interestingly, some of the dialogue consisted of reproduction of directives and reprimands, a familiar event to parents and teachers.) Yet, this "higher functioning" autistic child was not producing "triggered" responses. It was quite evident to his teacher and to me that he was thinking about those events when questioned about them. His responses involved activities and situations in which I had participated; however, he did not have the means to relate that information by generating productive language forms. In another interaction, a young woman with autism approached me with a gauze pad taped to her arm. While touching the pad she stated, "The doctor looked at your pain yesterday . . . blood . . . needle. . . Don't worry, this won't hurt you." Through

the use of delayed echolalia and single-word utterances, she was able to provide information about her previous day's ordeal by using language from the previous day. Once again, information was conveyed by a reproduction of language from the events themselves, possibly involving retrieval from episodic memory. Communicative intent was clearly demonstrated, yet gestalt forms were used in lieu of creative language.

Pronominal reversal, another frequently cited "symptom" of autistic language, is a frequent by-product of delayed echolalia. By using gestalt forms, a child may produce utterances including second- or third-person references to the child him/herself. If the child reproduces the utterances at a later time, the result is one of apparent pronominal confusion (e.g., "Are you hungry?" "He is tired"). Actually, the child is probably not concerned as much with pronouns as with reproducing whole units (see Fay, 1979, for further discussion).

In addition to patterns of immediate and delayed echolalia and pronominal reversal, inflexibility in social interactive patterns of autistic persons also provides evidence for gestalt processing. Autistic persons may acquire knowledge of the structure of social interaction (e.g., certain utterances are used as conversational openers and others for terminating conversations) but demonstrate incompetencies in handling the subtle adjustments and modifications necessary for an efficient exchange of information (i.e., the content of interaction). The use of stereotypic conversational openers, patterns of incessant questioning, and demands for specific responses suggests that autistic persons may be preoccupied with the predictability of the structure of interactive exchanges, or its external framework, rather than with its internal content (i.e., the information shared). This preoccupation may represent a struggle to at least partake in such exchanges. For example, Hurtig, Ensrud, and Tomblin (1982) demonstrated that higher functioning autistic children often used questions as a strategy to open conversations, with little concern for the information provided by others as a response to the questions.

As mentioned, once interactive rituals are established, departures from them may be greeted with confusion or even great anxiety. For example, a mother reported that her "higher functioning" adolescent son with autism insisted nightly that she provide him with specific instructions for setting the dinner table by saying, "Mother, now tell me to put the plate down . . . tell me to get the cups," and so on. This young man appeared to need a replication of the established verbal routine although he obviously did not need instructions to carry out the task that had become a familiar activity. One young child whom I saw for language therapy developed a routine of running to and sitting in a yellow reclining chair in the secretary's office. In order for us to proceed peacefully to the language room, I had to repeat "It's a yellow chair" after him, which was actually a repetition of an utterance I had produced at some earlier time. Such accounts of demands for specific responses by autistic children are certainly not unique. What they seem to indicate is a need to realize interactional gestalts, one aspect of the

need for sameness that might be caused by an extreme form of gestalt processing. As Kanner (1943) indicated,

Their world must seem to them to be made of elements that, once they have been experienced in a certain setting or sequence, cannot be tolerated in any other setting or sequence; nor can the setting or sequence be tolerated without all the original ingredients in the identical order. (p. 41)

Similarly, one's perception of listener needs involves an ongoing sequential analysis of verbal information provided by a co-interactant as well as analysis and comprehension of nonverbal cues of boredom, confusion, and the like. Higher functioning autistic individuals appear to approach social interactions with predetermined agendas or with an inflexible sense of how a verbal exchange is to be structured (Dewey & Everard, 1974). A gestalt mode of processing may actually preclude the types of ongoing analysis necessary for subtle listener-sensitive adjustments, resulting in a reliance on familiar routine.

Obviously, communicative skills are affected detrimentally by a rigid adherence to specific routines of discourse and social interaction. If effective communication is characterized by ongoing adjustments and modifications (such as repairing breakdowns, providing background information, shifting topics, and shifting style), and if such adjustments are achieved through a process of ongoing sequential analysis of the interaction, a gestalt processing mode surely does not seem suited for the analytic demands of fluid communicative interactions. One may speculate that the perceptual and conceptual demands of social interaction may account for autistic persons avoiding social interaction.

In summary, language patterns of autistic persons are characterized frequently by repetition of unanalyzed forms that may be noncommunicative or may be used as a means to express communicative intent. Such expressive patterns may reflect an inability to segment others' utterances and realize their internal structure, which would allow for semantic-syntactic processing. The reproduction of memorized multiword units would seem to be devoid of the creative and generative linguistic processes typically associated with the spontaneous production of multiword utterances. In an analogous manner, autistic persons approach social interaction by establishing and rigidly adhering to highly routinized patterns. The structure of interactive exchanges may be understood and replicated; however, ongoing adjustments which are so vital to communication may be absent and thus cripple successful interactive exchanges. Furthermore, a gestalt processing mode will also affect the process and sequence of language acquisition.

### *Language Acquisition and Gestalt Processing*

Due to the paucity of longitudinal research on language acquisition in autism, hypotheses about patterns of language acquisition in autism are offered based on available information from the literature (Baltaxe &

Simmons, 1977) as well as from my research (Prizant, Note 1) and observations. Once again, I refer to relevant literature on normal first- and second-language learning.

In her discussion of analytic and gestalt styles of language acquisition, Peters (1977) speculated that normal children demonstrate significant variance and might fall at different points along the continuum between primarily gestalt and primarily analytic processors. She indicated that most children will be analytic or may use both analytic and gestalt forms. However, those who are primarily gestalt are at a disadvantage because they will eventually have to "convert slowly and painfully to a more analytic approach to language" (p. 571).

Because autistic persons appear to be limited to an extreme style of gestalt processing, the process of language acquisition, even for higher functioning autistic individuals, is truly painful. Those who may remain primarily echolalic demonstrate a failure to move along the continuum toward analytic processing due to cognitive limitations. Greater cognitive potential probably allows some movement toward an analytic approach to language acquisition after an extended period of primarily gestalt processing. This process may be represented by a model of language acquisition in autism (Prizant, Note 1). The model (see Figure 3) was originally constructed based upon research on the functions of immediate echolalia (Prizant, Note 1) and the research of Baltaxe and Simmons (1977). The notion of stages of language acquisition is presented for convenience of presentation; no claims are made as to their psychological reality. The process is best understood as continuous, without clear points of delineation.

(a) In Stage 1, utterances are predominantly echolalic and may fulfill a conversational "turn-taking" function (Prizant & Duchan, 1981) or "phatic" function (Caparulo & Cohen, 1977). Some utterances may also be produced for self-stimulatory effects (Prizant & Duchan's, 1981, "nonfocused" function). This is supported by most accounts of the early speech of autistic children in that their first spoken utterances are echolalic with little evidence of comprehension (Ricks & Wing, 1975).

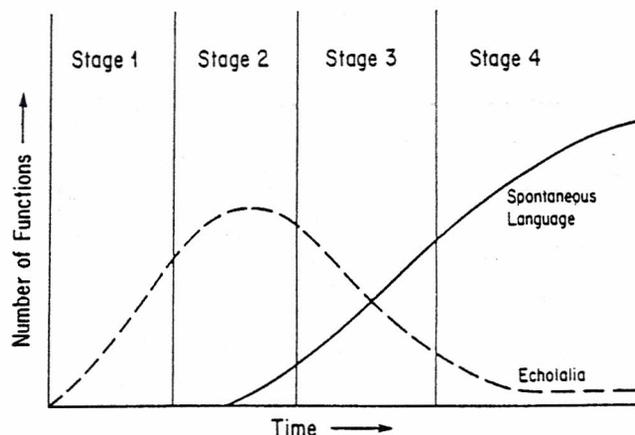


FIGURE 3. Change over time in the number of functions served by echolalia and spontaneous language.

(b) In Stage 2, the growth of a child's general knowledge of the world and relationships within the environment may exceed linguistic growth. [Evidence for such a gap between cognitive and linguistic growth in autism is now becoming available (Wetherby & Gaines, 1982)]. A gestalt processing mode may handicap a child's ability to observe and extract internal consistencies of language to the extent that language remains predominantly echolalic. However, due to cognitive growth and experiences in social interaction, a greater variety of functions will be served by echolalia as a child attempts to express intentions and to comment on relationships within the environment. Echolalia may also serve as a means of behavioral self-regulation and as a rehearsal strategy. Towards the end of Stage 2, a child may also be applying and acquiring particular strategies to break down echolalic utterances. Such strategies may represent movement to a more analytic approach to language, which allows for an increased understanding of the constituent structure of utterances in reference to formal syntactic structure and the semantic relationships encoded by them. For some children, it is possible that the emergence of apparently spontaneous speech may involve both a breaking down of echolalic utterances and acquisition of one- and two-word utterances reflecting early developmental patterns. For other children, acquisition of more flexible language knowledge consisting of simple combinatorial rules may depend solely on the breaking down of echolalic utterances, allowing for the conjoining of language "chunks." (Baltaxe & Simmons, 1977, found such patterns in the bedtime soliloquies of their 8-year-old autistic subject.) This latter group would probably represent those with greater cognitive deficiency. In fact, children who do not advance beyond Stage 1 or Stage 2 behavior would reflect the lowest functioning group of verbal autistic children, who remain echolalic for extended periods of time.

(c) Stage 3 is characterized by increasing flexibility in language structure through the acquisition of linguistic forms governed by knowledge of early semantic-syntactic rules and/or a further breaking down and recombination of segments of echolalic utterances. As more flexible language is acquired, functions previously served by echolalia will be expressed through spontaneous forms. Therefore, the declining number of echolalic utterances will serve fewer functions.

Within Stage 3 there will be a period in which similar functions will be served by spontaneous and echolalic utterances, followed by a decrease in echolalia with a concomitant increase in spontaneous language. It is no coincidence that as spontaneous utterances increase, echolalia decreases. In fact, a casual relationship is being suggested in that the breaking down of echolalic utterances may be part of the process of acquiring more spontaneous forms.

(d) Finally, Stage 4 is characterized by the acquisition of more spontaneous and flexible language that reflects a child's increasing knowledge of semantic-syntactic and morphological rules. Echolalia no longer serves cognitive functions (i.e., self-regulation, rehearsal) because

the child has become cognitively capable of internalizing operations for processing language and regulating behavior. Communicative functions are now served primarily by creative, spontaneous utterances. However, vestiges of echolalic behavior may appear during stages of fatigue, confusion, or distraction. Simmons and Baltaxe (1975) have noted such residual patterns in the language of their autistic subjects.

The importance of echolalic speech to further language acquisition was suggested recently by Howlin (1981). In her language training study with autistic children, she noted that echolalic children in both the experimental group (who received operant language training) and the control group (who received no language training) had acquired "good phrase speech" at follow-up. She indicated that even if children are somewhat echolalic, they are "likely to achieve fairly good communicative speech eventually, even in the absence of intensive language training" (p. 98). Howlin's findings would seem to suggest that the presence of echolalia is an important prognostic factor for further language growth, which has also been suggested by Lovaas (1977). It is suggested herein that echolalia provides the "raw material" for further language growth, thus explaining its prognostic value. Comparisons between analytic and gestalt styles in language acquisition and use are summarized in Table 3.

If, indeed, language acquisition and communicative behavior in autism can be explained by a particular mode of cognitive processing, additional evidence for such a processing mode should be apparent in other aspects of learning. Therefore, the discussion now shifts briefly from linguistic and communicative behavior to patterns of cognitive processing and learning in non-communicative and nonverbal domains.

### *Cognitive Processing and Learning Patterns in Autism*

The literature on autism is replete with descriptions of wholistic or gestalt learning patterns. Prior (1979) reviewed research on learning disabilities and abilities in autism and concluded that particular weaknesses are most frequently noted on tasks demanding analytic, sequential processing. In contrast, much greater success has been reported on tasks that can be accomplished through recognition without analysis.

Frequently cited abilities of autistic persons include an excellent rote memory for both visual and auditory information and proficiencies in tasks demanding visual-spatial judgment and visual-spatial pattern recognition (Prior, 1979). Specific skills related to these abilities include both recognition and reproduction of melodic patterns, construction of visual-spatial arrays from samples (e.g., elaborate arrangements of blocks), and solution of jigsaw puzzles, form boards, block-design tasks, and so forth. Prior (1979) noted that such abilities are nonanalytic and nonabstract and are most often "exceptional" only in comparison to the severe disabilities in language.

TABLE 3. A comparison between analytic and gestalt modes in language acquisition and use.

<i>Analytic mode</i>	<i>Gestalt mode</i>
1. Basic units of language are single words.	1. Basic units of language may be words, multiword utterances, phrases, and/or clauses, and all possibilities may co-occur as units during one period of time.
2. Early language acquisition involves movement from single words to two- and three-word utterances encoding early semantic functions and relations.	2. Early language acquisition involves acquisition of multiword utterances functioning as single units. May involve utterances which appear grammatically sophisticated.
3. Further growth in language is achieved through acquisition of grammatical morphemes and functors allowing for noun phrase and verb phrase elaboration.	3. Further growth in language involves analysis and segmentation of unanalyzed chunks into constituent components and/or movement to an analytic mode.
4. Language is productive and generative from early stages of acquisition with rule induction allowing for increased complexity.	4. Language is relatively inflexible in early stages with limited generative use. Increased complexity is achieved through recombinations of prefabricated patterns and further movement to an analytic mode.
5. Language use is generalized to relevant objects and events after short periods of situationally specific usage.	5. Language use may remain specific to situational contexts for extended periods.
6. Analytic processors may be more focused on internal structure (semantic and/or grammatical relationships) and referential use of utterances.	6. Gestalt processors may be more focused on intonation and use of language in the structure of social interaction.

communication, social interaction, and abstract reasoning. Furthermore, Rimland (1978) has argued that if truly exceptional splinter skills or idiot savant behaviors are observed in autism, they are related to right-hemisphere abilities.

Other researchers (Baltax & Simmons, 1981; Blackstock, 1978; Fay & Schuler, 1980; Oxman & Konstantareas, 1981; Prior & Bradshaw, 1979) also have suggested that patterns of ability and disability in autism may indicate a right-hemisphere processing preference which is believed to be "wholistic" rather than "analytic" (Moscovitch, 1981). Recent experimental evidence based on EEG studies and dichotic listening tasks also supports a right-hemisphere processing preference (Dawson, Warrenburg, & Fuller, 1982; Wetherby, Koegel, & Mendel, 1981). Interestingly, Peters (1977, 1980) noted a profile of skill strengths in her normal subjects who demonstrated gestalt language styles that is strikingly similar to profiles of abilities in autism as discussed by Prior (1979) (e.g., excellent rote memory, mu-

sical and visual spatial skills). Peters also implicated a right-hemisphere preference in her subjects.

Fay and Schuler (1980) have discussed patterns of ability and disability in autism from a slightly different orientation. They indicated that autistic persons have considerable difficulty with processing and perceiving patterns in transient, temporally ordered stimuli (e.g., speech, auditory patterns), yet they are much more successful with static, spatially organized stimuli (e.g., puzzles, pictures). Hermelin (1976) noted that many tasks involving spatial, static information can be accomplished by retaining information in whole, unanalyzed forms, yet processing temporally organized stimuli, especially as exemplified by language and social interactive behaviors, demands ongoing analytic, sequential analysis. Thus, recent research suggests strongly that a gestalt or a wholistic processing preference may be responsible for patterns of learning abilities and disabilities of autistic children. Furthermore, normal children who demonstrate gestalt language acquisition styles and forms in early stages of language acquisition may also demonstrate learning profiles similar to autistic children, but certainly not to the same degree or extent.

In summary, the literature on cognitive processing indicates that autistic persons demonstrate much greater success in nonlanguage tasks that can be accomplished by a wholistic or gestalt processing approach. Furthermore, some researchers (Hermelin, 1976; Prior, 1979) have suggested that when faced with problems demanding analytic processing or rule induction, autistic persons will most often attempt to impose a solution based on pattern reproduction or rote repetition. Therefore, it seems logical to conclude that in autism gestalt language forms and a gestalt style of language acquisition, language use, and social interaction may very well result from the imposition of a learning style that is not well suited to the analytical demands of language acquisition and social interaction.

### *Concluding Comments*

Similarities between gestalt language patterns and cognitive styles of persons with autism and of nonautistic persons demand more attention from researchers and theorists. Although similarities can be observed, the differences in communicative ability between autistic persons and others who use gestalt forms and gestalt acquisition styles are striking. It is not the presence of such language and communicative patterns that constitutes the pathology, but the degree to which they are maintained, in terms of exactness of structure and length of time that they remain the predominant approach to communication for autistic persons. To fully understand how processing styles affect the acquisition and use of language, detailed longitudinal research needs to be undertaken, following children from prelinguistic stages through the acquisition of complex and spontaneous language. This information is unavailable at the present time.

The stated purpose of this discussion was to attempt to understand characteristics of autistic language, social interaction, and language acquisition by referring to a gestalt processing mode. There is a potential risk of generalizing these comments to the large group of autistic individuals who show similar behavioral patterns yet, at the same time, are very different from one another. However, literature on language acquisition, language use, and cognitive functioning in autism supports these hypotheses. If this discussion has illuminated the short-sightedness of describing autistic communicative patterns as isolated deficits, its goal has been realized, at least to some extent. The issues involved in considering communicative behavior in autism are highly complex, but the potential rewards are not limited solely to a greater understanding of autism. Communication problems in autism may provide us with a guidepost at an extreme end of human competence by which we can delineate the possible range of ability and disability of communication. Clearly, in order to approach this task, we must attempt to discover how autistic persons acquire the requisite forms and how they attempt to understand and acquire the conventions of communication.

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