

## THE FUNCTIONS OF IMMEDIATE ECHOLALIA IN AUTISTIC CHILDREN

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This research was intended to discover how immediate echolalia functioned for autistic children in interactions with familiar adults. Four echolalic children were videotaped at school and at home, in both group and dyadic interactions in natural situations such as lunchtime, family activities, and play activities in school. After conducting a multilevel analysis (of over 1,000 utterances) of verbal and nonverbal factors, response latency, and intonation, it was discovered that immediate echolalia is far more than a meaningless behavior, as has been previously reported. Seven functional categories of echolalia were discovered and are discussed in reference to behavioral and linguistic features of each category. It is argued that researchers who propose intervention programs of echo-abatement may be overlooking the important communicative and cognitive functions echolalia may serve for the autistic child.

Language abnormalities and problems in communication are primary criteria in the diagnosis of autism. Of the language abnormalities, immediate echolalia is the most frequently cited characteristic of verbal autistic children (Prizant, 1975). Rutter (1968) and Wing (1971) found that echolalia was characteristic of some three-quarters of the autistic children they studied. Fay (1969) defined immediate echolalia as the "meaningless repetition of a word or word group just spoken by another person." (pg. 39). In attempting to differentiate between autistic and non-autistic manifestations of echolalia, he noted that in autism, echolalia is evidenced at preschool and school ages and is characterized by longer echoic utterances, a larger percentage of echoic utterances, delayed echolalia, and minimal mitigation (change or revision).

There is much controversy regarding the significance of immediate echolalia for autistic children. On one hand, behaviorally oriented researchers have considered echolalia a nonfunctional (Koegel, Lovaas, & Schreibman, 1974) or an undesirable symptom (Coleman & Stedman, 1974) of the language behavior of autistic children. Such researchers have considered echolalia a communication disorder in itself and are therefore advocates of the extinction or replacement of echolalic behaviors through the use of behavior modification procedures (Lovaas, 1977).

On the other hand, a number of theorists have recently considered immediate echolalia in terms of how it may function for autistic children. Fay (1969) has suggested that immediate echolalia enables autistic children to

maintain social interaction in the face of a severe comprehension problem. He believed that autistic echolalia has as its basis "verbal comprehension difficulties coupled with an urge to sustain . . . social contact" (pg. 45). Similarly, Shapiro (1977) has attributed the function of social facilitation to immediate echolalia, and Philips and Dyer (1977) have gone as far as to hypothesize that immediate echolalia is a necessary stage of language development for verbal autistic children. In describing "affirmation by repetition," Kanner (1946) has been the only researcher to ascribe a specific function for immediate echolalia. Although these authors have attempted to understand immediate echolalia from a functional perspective, the functions immediate echolalia may serve still need to be specified.

Previous research has not provided information on its functions, due to a number of related reasons. First of all, the primary focus of such research has been on the language structure of echolalic utterances. For example, Fay (1967) and Shapiro, Roberts, and Fish (1970) devised classifications of echolalic utterances that described structural linguistic change imposed on the original utterance. Voeltz (1977) and Buium and Steucher (1974) demonstrated that autistic echolalia was not just rote repetition but involved structural changes that demonstrated syntactic rule mediation. Although these studies provided important information regarding structural linguistic considerations of immediate echolalia, they offered little insight regarding functionality.

A second characteristic of previous studies, which may be partially due to the focus on language structure, is the lack of description of immediate echolalia as it occurs in natural communicative interactions. Without exception, because communicative context and nonverbal behavior were of little or no interest to the researchers, previous studies have used audiotapes or written transcripts. In addition, researchers (Schreibman & Carr, 1978; Voeltz, 1977) have commonly used a corpus of stimulus utter-

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TABLE 1. Breakdown by percentage of each child's expressive language behavior according to utterance types, and results of standardized intelligence testing.

Child	Age	% of immediate echolalia*	Approximations of Spontaneous Speech**	Other verbal productions (delayed echolalia, rote routines †)	Results of Intelligence Test
Brian	(6:3)	27.7%(205/740)††	60%	10%	76 (Leiter International Scale)
Jeff	(5:2)	40.4%(334/827)	50%	10%	69 (Stanford-Binet Scale)
David	(4:8)	29.4%(183/623)	10%	60%	Untestable
Robbie	(9:3)	53.0%(287/541)	Negligible	50%	Untestable

\*Based on analysis of the tapes.

\*\*Approximations based on the videotapes and judgements of the language pathologist, teacher, and teacher assistant.

†Memorized verbal routines which are not necessarily reflective of comprehension (e.g., Adult: *What do you say?*; Child: *Thank you.*).

††Number of immediate echoes/number of total utterances.

solely on the analysis (approximately 250 hours) of the echoic utterances from the videotapes.

Each of the subjects was videotaped in the following situations:

1. *Home*—This situation involved direct interaction between the child and one or more family members in the home, in which specific requests were made of the child. The only instruction given to the parents was to engage the child in activities that were familiar to him and would be conducive to social interaction.
2. *School-Individual*—These situations involved each child in his classroom setting, in which he was interacting directly and on an individual basis with the teacher or language clinician. Specific requests were presented to the child in the framework of the child's daily school activities.
3. *School-Group*—These situations were characteristic of group activities and interaction in each child's classroom, (e.g., lunchtime physical games).

Each child was videotaped three times in individual interactions with different, but familiar adults, and one time at home. In addition, five periods of group activities were videotaped at approximately one-month intervals. All echoic utterances were extracted for analysis from the 21 videotapes, which averaged 25 minutes per recording. The data collection extended over an eight-month period for each child.

The echoic utterances were of the type of repetition that is commonly referred to as immediate echolalia. The child's echoic response must have occurred subsequent to the interlocuter's utterance, and it must have consisted of segmental and/or suprasegmental similarities to the utterance of the previous speaker, involving either rigid echoing of the model utterance (pure echolalia) or selective repetition of elements occurring within two utterances of the original utterance.

An important aspect of the research was to determine if a categorical system representing the variety of uses of echolalia could be derived from the tapes. Therefore, the classification was not developed on a priori basis. Be-

cause of the objective of deriving a categorical system from the data, we needed to analyze the factors involving (1) communicative context, (2) structural linguistic characteristics of the echoic utterances, and (3) latency between the end of the original utterance and the onset of the echoic utterance. The importance of the factors was suggested by informal observations and pilot investigations conducted by the first author (Prizant, 1975). The following are the factors that were deemed appropriate for analysis:

*Communicative Context.* Responses were examined for the following characteristics:

- a) Was the child being addressed directly?
- b) Did the child change his behavior in any way at the time of the production of the echoic utterance?
- c) What or who was the child looking at prior to, during, and after the echoic response? (Gaze behavior)
- d) Was the echoic utterance functionally appropriate to the task?
- e) Did the child display any indications of expecting a further response from the previous speaker (verbal or nonverbal?)

*Structural Characteristics.* Each echoic response was compared to the speaker's utterance according to structural change such as a) addition, deletion, or substitution of segmentals; b) tempo and loudness; and c) intonation contour.

*Measurement of latency of onset of the echoic utterance.* Subsequent to the functional categorization, response latencies were measured on a graphic level recorder to determine if the differences among the mean latencies of the echoes in each functional category helped to differentiate the categories.

#### Data Analysis

In the first level of analysis, model utterances and echoic utterances were extracted from the videotapes and each pair of utterances was coded as part of a stream

the children, which he had never seen. After analyzing and categorizing all 53 echoic utterances from the videotape, his categorization was compared to the original analysis previously conducted by the investigator. Interjudge reliability for functional categorization was .96. Disagreement dealt with features of timing of the utterance in relation to the child's activity. Intrajudge reliability was .97 based on reanalysis of a videotape with 63 echoic utterances. The reanalysis was conducted 6 months after the original analysis.

## DISCUSSION

### *Deriving Structural Categories From the Tapes*

The most striking differences that were initially discovered among the echoes was that many echoes were produced with no change in behavior nor any task attempt (if a task was requested of the child), while others were produced with either an accompanying or subsequent task attempt providing evidence of some comprehension of the previous utterance. (However, some echoes not accompanied by an attempt to perform an activity may reflect a lack of willingness to comply, rather than a lack of comprehension.)

Another dichotomy was between echoes that appeared interactive in that they were directed to the interlocutor with appropriate gaze behavior or a gaze check subsequent to the utterance, and echoes that were noninteractive, as suggested by lack of directedness of the utterance (low volume, whispering) and lack of specific gaze orientation. It was therefore determined that, in general, the following categorical possibilities existed:

1. *Interactive echoes* with concomitant evidence indicating some degree of comprehension of the model utterance.
2. *Non-interactive echoes* with concomitant evidence indicating some degree of comprehension of the model utterance.
3. *Interactive echoes* with no evidence of comprehension of the model utterance.
4. *Non-interactive echoes* with no evidence of comprehension of the model utterance.

Further subcategorization of the four major categories dealt specifically with timing of the echoic utterance in relation to the child's behavior (in cases in which there were significant behavioral changes) and the specific nature of the behavioral changes. Such changes included gestures of pointing, showing, and requesting, and such actions as picking up, grabbing, and accepting objects.

With these further considerations, Category 2 (non-interactive, some evidence of comprehension) subdivided into two distinct categories as determined by whether the echo occurred during the behavioral change or prior to the behavioral change (with some interval between the echoic utterance and the subsequent response). Category 1 subdivided into three distinct categories, that were primarily determined by the nature of the child's action on an object, and/or nonverbal indi-

cations of expecting a further response from the interlocutor (gaze hold, grabbing interlocutor's hand or arm, etc.).

By documenting observable behaviors and determining how these behaviors clustered with different echoic utterances, the seven categories were derived. Each category was described in terms of the features needed for inclusion in that category, while other co-occurring behaviors indicated variations within a particular category. Therefore, some behaviors were relegated to a secondary role in category determination.

### *Ascribing Functions*

Inasmuch as the categories were structural patterns derived from observable behaviors, the next problem involved the attribution of functions to each of the categories. For example, when presented with the echoic utterance that *Let's get the boat* produced with evidence of comprehension (i.e., child gets boat), there was the dilemma of attributing to the child either full knowledge of the semantic relations of the utterance, or little or no knowledge of the meaning of the utterance. It is not implied that the child fully understood the semantic and syntactic relationships in the utterance. However, comprehension was considered in terms of a child's relevant, intentional actions that occur immediately prior to, during, or subsequent to the echoic utterance. Meaning was considered in terms of usage, or how an utterance functioned for a child.

### *The Functional Categories*

Following are the defining characteristics of the functional categories according to core attributes (see Appendix B for summary). The descriptions represent canonical forms of each category, with the presence of the central features or core attributes being necessary for the inclusion of an echoic utterance in that category. Core attributes for the functional categories are designated by an asterisk. In addition, frequently occurring secondary attributes based on structural linguistic and/or latency analyses are listed subsequent to the core attributes.

#### *Non-focused*

- \*1. No evidence of attention to person or object as determined by gaze or body orientation.
- \*2. No significant behavioral change indicating evidence of comprehension.
- \*3. No evidence of echoic utterance being directed towards the interlocutor nor any evidence of expectation of a further response from the interlocutor.
4. Echo may occur during agitated or highly aroused state (e.g., pain, temper tantrum, etc.).
5. Echo is usually rigidly congruent to the model utterance.

The category of non-focused echolalia appeared the most automatic, and relatively nonfunctional variety; therefore, it may be a misnomer to call it a functional category. Although the occurrence of nonfocused echoes

Self-regulatory echoes are similar to rehearsal echoes in that they appeared to serve a cognitive rather than communicative function. Therefore, most self-regulatory echoes were not clearly directed to the interlocutor. The major distinction between the rehearsal and self-regulatory categories was that rehearsal echoes appeared to lead to a response, while self-regulatory echoes appeared to help a child direct his own behavior during the production of the utterance. This phenomenon seems similar to "self-talk" in young normal-speaking children, in which they may verbally direct their own behavior. Consider also the normal-speaking adult who is attempting to master a difficult motoric task. For example, when learning a new dance step, adults may verbalize their intended actions while performing them, e.g., *Left foot forward, right foot back*, etc. Some of the children used multiple repetitions of an utterance if a task couldn't be completed promptly. For example, while searching for hidden objects, a child repeated, *Go find the dog* until he was able to complete the task. (See Luria, 1959, 1966 for discussions of the role of speech in the regulation of behavior.)

#### *Yes-Answer*

- \*1. Evidence of attention to person or object as determined by gaze or body orientation.
- \*2. Verbal or nonverbal evidence of affirmation prior to or subsequent to the echoic response (e.g., acceptance of object, reaching for object, initiation of appropriate action.)
- \*3. Echoic utterance is directed to interlocutor as evidenced by paralinguistic or gaze.
4. Utterance is usually echoed in an intact form with occasional change in intonation.
5. The child often displays some nonverbal indication of expecting a further response from the interlocutor (e.g., gaze hold, child grasping hand or arm of interlocutor, open-handed reach).

The Yes-Answer category has been referred to as "affirmation by repetition" (Kanner, 1946) and is the only specific function attributed to immediate echolalia in the autism literature. However, to avoid relying on inference, an echoic response to a "Yes-No" question was not sufficient for inclusion in this category. The child had to display some nonverbal indication of affirmation independent of the verbal response. Therefore, responses considered "affirmation by repetition" by other researchers may not have fit the Yes-Answer category unless evidence of affirmation was documented.

#### *Request*

- \*1. Evidence of attention to person or object as determined by gaze or body orientation.
- \*2. Verbal or nonverbal evidence of the child's desire to obtain an object or perform an action prior to, during, or subsequent to the echoic utterance (open-handed reach, carrying out action when given permission).
- \*3. Echoic utterance is directed to interlocutor as evidenced by paralinguistic or gaze.
4. The child displays some nonverbal and/or verbal indication of expecting a further response from the interlocutor.

5. Child's response usually consists of echoic segment with added elements, although some rigidly congruent echoic utterances also serve the request function.

In general, the request category probably exemplifies the most intentional and least automatic response category. The child most often used some of the interlocutor's words, and then added elements to indicate a desire to obtain an object or perform an action. The request function was most often served by echolalic structure that were affected by some changes (usually additions) and may therefore be the most extreme examples of intentional mitigation.

For the autistic child, the first communicative and functional spontaneous speech, and/or delayed echolalia, appears to serve a request function. One would expect a child's motivation to be relatively strong when he desires certain needs met. Some verbal autistic children who are relatively noninteractive are most often observed initiating interaction during mealtime or during favorite activities, situations which provide a strong inherent motivation to communicate.

Request echoes appeared related to Yes-Answer echoes in that the child's goal was acquisition of a desired object, help from the interlocutor, etc. The major differentiation between these two categories was that with the question in the Yes-Answer echoes (e.g., *Do you want \_\_\_\_\_?*), the child was provided the language, and all he needed to do was indicate affirmation by repeating the utterance. However, with request echoes, in which the request was often in response to an open-ended question, a child most often needed to add words to an echoed segment to specify his desires (e.g., Question: *What do you want?* Answer: *What do you want a pringle.*).

## CONCLUSIONS

The results of this study suggest some directions for research on the language behavior of autistic children. Future research should attempt to examine deviant characteristics of autistic language within a framework of how such characteristics may function for the children and how they possibly fit into a theory of language acquisition for autistic children. Most previous research has examined characteristics such as immediate and delayed echolalia as isolated phenomena, rather than as integral parts of the developing linguistic and cognitive system of autistic children.

In addition, the results of this study raise many questions concerning the wide variety of behavior modification programs that advocate extinction or replacement of immediate echolalia with rotely trained surface structures. Specifically, indiscriminate extinction of all forms of immediate echolalia is ill-advised because of the functions that echolalia may serve for autistic children. It may be fruitful to view immediate echolalia from a functional perspective and to attempt to discover patterns of usage for individual children.

