BEDTIME SOLILOQUIES AND LINGUISTIC COMPETENCE IN AUTISM

Christiane A. M. Baltaxe and James Q. Simmons
University of California, Los Angeles

This study investigates the linguistic competence of an autistic child by means of her bedtime soliloquies. It suggests the usefulness of such monologues as a diagnostic tool and addresses the question of the interrelationship between echolalia and language development. Three bedtime soliloquies of an eight-year-old echolalic autistic child are analyzed along the dimensions of echolalia versus propositional speech, types of ungrammaticality produced, and analysis of connected discourse. The results are compared with those of a normal child reported earlier in the literature. The present analysis demonstrates the difficulties in the judgment of propositional versus echolalic speech. The types of ungrammaticality were found to be useful indicators of apparent differences between the acquisition process in the normal and the autistic child. They revealed that the autistic child may use specific linguistic strategies only minimally utilized by the normal child. The discourse analysis points up additional differences as well as similarities in the way the autistic subject organizes her utterances in connected discourse. It also shows that the autistic child has specific but limited linguistic competence. It is hypothesized that the autistic subject acquires more functional, useful language by a process of gradually breaking down echolalic patterns. In terms of therapy, these findings would support the use of echolalia as a basis for language training.

Abnormalities of language are among the core characteristics of autism and rank high in making a clinical diagnosis and prognosis (Simmons and Tymchuk, 1973; Ornitz and Ritvo, 1968; Kanner, 1943, 1946; Rutter, 1968, 1972). The language histories of autistic children show a considerable variability ranging from failure to develop communicative skills to delayed development or arrest after early normal development. When language does develop, a wide range of linguistic disturbances can be observed. Language abnormalities appear to be the most persistent of the array of disturbances. Most autistic children who have grown to adolescence still show deficits in language (Simmons and Baltaxe, 1975).

Echolalia, which is the imitation of a verbal utterance by another, is among the chief linguistic characteristics of autistic language. Rutter (1966) has claimed that autistic children who demonstrate more adequate language function later in life pass through a stage of echolalia, and that such a stage seems to be a prerequisite to the development of more useful language behavior.

Although the concept of echolalia has been widely mentioned in the clinical literature on autism (Kanner, 1943, 1946; Griffith and Ritvo, 1957; Fay, 1966, 1967a, b, 1969), its possible role in the language acquisition process in the disorder has not been brought into sharp focus. Current psycholinguistic studies emphasize the creative aspect of language in the developmental process in terms of rule-governed behavior. Creative or propositional speech is one of those concepts much talked about but not clearly defined in the linguistic literature. Generally speaking it refers to the use of an internalized system of linguistic rules and categories by which the speaker of a language creates an utterance anew each time he uses it. In the clinical literature, propositional speech tends to be contrasted with automatic speech. It is also characterized as left-hemisphere speech in contrast to right-hemisphere speech. The role of imitation in the development of linguistic competence by normal children is controversial at best (Menyuk, 1969; McNeill, 1970; Fraser, Bellugi, and Brown, 1963). Echolalia or imitation in the language development of the autistic child poses a challenging problem both in terms of possible deviation from normal processes and in terms of its role in designing therapy programs.

Two basic types of echolalia, immediate and delayed, have been recognized and described for autistic language. Immediate echolalia is the repetition of an utterance immediately after a stimulus utterance. Delayed echolalia can be removed from the original stimulus utterance by a variable length of time. It may involve the repetition of an utterance hours, days, weeks, or even months after it had been originally addressed to the echoer (Kanner, 1946; Griffith and Ritvo, 1957). Mitigated echolalia is a term used when any part of the repeated utterance has been modified in the repetition (Fay, 1967b).

In general, the listener must determine from the context of the situation whether an echoic utterance has communicative intent (Baltaxe and Simmons, 1975). Autistic echolalia also tends to be associated with a lack of spontaneous verbal behavior.

Assuming, as has been claimed, that autistic children pass through an echolalic stage before acquiring more adequate verbal function, the following possibilities arise:

1. Echolalia ceases and the autistic child subsequently develops creative or rule-governed speech behavior unrelated to echolalia;
2. Echolalia and creative or rule-governed speech are used during the same period of development, but rule-governed speech develops separately from echolalia following normal acquisition patterns; and
3. The child is unable to develop rule-governed speech in the normal fashion. More functional speech behavior develops based on echolalia by processes which may be different from those observed in normal development.

Supported by an earlier study of the language patterns of adolescent autistics (Simmons and Baltaxe, 1975), we would like to consider this third possibility. The method of study will be through the linguistic analysis of bedtime soliloquies.

BACKGROUND AND RATIONALE FOR THE USE OF BEDTIME SOLILOQUIES

In the study of normal language development, samples of spontaneous verbal interchange and connected discourse make up the bulk of the linguistic corpus. One of the problems which faces the researcher of autistic language is the frequent lack of an adequate linguistic corpus since the echolalic autistic child characteristically lacks spontaneous verbalizations.

We have noted, however, that echolalic autistic children engage in presleep bedtime soliloquies during which spontaneous verbalizations can be rather voluminous. These soliloquies are also seen in normal children. An earlier study in normal language development set a convincing precedent for measuring the level of linguistic functioning through the analysis of such soliloquies. Weir (1962) observed this phenomenon and analyzed the presleep monologues of her two-year nine-month-old son. Her analysis of these verbalizations showed that they accurately reflected the child's level of linguistic competence. The child observed the same grammatical rules which he also used during his daytime verbal interactions. By comparison, the range of his vocabulary in the bedtime soliloquies was somewhat restricted. Weir interpreted these monologues as a condensed summary of the child's experiences during the day and in terms of self-educational linguistic games. Jakobson considered these monologues as language practice and observed that they brought "to light mechanisms of syntactic training" (Jakobson, 1962, p. 20).

These presleep monologues in Weir's (1962) study took on the form of a dialogue between the child and an imaginary interlocutor in which the child assumed the roles of both the speaker and the listener. The interlocutor could represent a person whom the child knew or a toy which he owned. In addition, the monologues contained statements addressed to no one in particular. Although utterances produced in the context of these soliloquies generally conformed to the linguistic rules used by the child during the day, Weir also found a small residue of utterances which exceeded the child's own productive rules, as judged by utterance length and syntactic complexity. She called these quotations. These quotations appear somewhat similar to what has been described as delayed echolalia in the autistic child. Weir excluded such utterances from her analysis as not reflecting the child's level of linguistic competence.

In the case of the autistic child, the analysis of bedtime soliloquies can be advantageous for several reasons: autistic children lack spontaneous daytime verbalization; soliloquies can be obtained easily by placing a tape recorder in the child's bedroom; and they provide a medium through which autistic language can be studied free from situational and linguistic contexts and intrusions which confound echolalic autistic verbalizations during the day. The child's eyes might wander in the middle of an utterance, and the utterance might change in its midst to include the intrusion of a visual or auditory stimulus encountered. An example of a visual intrusion would be:

Child's actual utterance	Now go and doorknob
Visual stimulus	doorknob
Possible target	Now go and do it

An example of an auditory intrusion would be:

Child's actual utterance	Come and stay away from that corner
Auditory stimulus (nurse addressing another child)	Stay away from that corner
Possible target	Come and listen

Target utterances and the intruding stimulus could be determined by observation of the child and its environment. The utterances containing the intrusion generally constituted an altered repetition of the child's immediately preceding utterance.

Therefore, bedtime soliloquies may provide a more accurate measure of the child's linguistic abilities. More importantly, where the child is uncooperative in a formal testing, bedtime soliloquies may also constitute the only approach toward assessing skills. Since bedtime soliloquies tend to be continuous over periods of time, they also provide a tool for the study of some of the processes and strategies by which the echolalic autistic child sequences and organizes discourse.

METHOD

Subject

The subject in this study was an eight-year-old autistic girl who was the second of two children and the product of a normal pregnancy. There were no perinatal or postnatal complications. Motor development was somewhat slow. According to her parents, initial speech developed around 18 months of age. Between the ages of two and three, the child was able to understand and produce words and sentences. Around age three, rocking and headbanging were noted and language development began to level off. At the age of four, the subject was hospitalized because of poor language development, poor social skills, and self-destructive behavior. At the time of initial diagnosis, she had developed a preoccupation with cylindrical objects, her speech was echolalic, and she was generally uncoordinated for her age. She had an alternating strabismus which was present at birth. Her EEG was normal. In terms of behavior, her smile was inappropriate, she showed finger flicking, and she had temper tantrums. Her startle response was positive. She enjoyed being tickled and picked up. Her behavior remained essentially unchanged over the next four years. At the time of the present study, when the patient was eight years old, her verbal interactions, insofar as they existed at all, were primarily of an echoic nature.

She generally demonstrated impairment in interpersonal relationships, which was manifested by aloofness, decreased physical contact, and poor eye contact. Deficits in social behavior included severe limitations in cooperative play, toy play, and self-help skills. She evidenced stereotyped activities as well as self-destructive behavior. Impairment in intellect was manifested by poor school performance. No formal psychological and language testing was possible since the subject was uncooperative. These characteristics fulfilled the diagnostic criteria for autism described by Ornitz and Ritvo (1968) and Rutter (1968).

Speech Samples

Three 45-minute speech samples of presleep monologues were collected by means of audio recordings. The recordings were made after the subject had gone to bed, the bedroom door closed, and the lights turned off. A microphone in her room was connected to a Wollensak tape recorder outside the door.

The tapes were transcribed phonemically by a linguist experienced and trained in this work. Accuracy of the transcriptions was established by multiple comparison of the audiotape with the transcriptions. Some revisions of the initial transcriptions were made based on comparisons with the audio playback. The transcriptions were analyzed along the dimensions of propositional (creative) versus echolalic speech, grammaticality, and discourse analysis. The method of linguistic analysis was influenced by the principles of contemporary linguistic theory as developed by Chomsky (1957, 1965) and others. The discourse analysis was influenced by the methods used by Weir (1962) and Keenan (1974).

Propositional (Creative) versus Echolalic Speech

Six raters, all but one with a background in linguistics, worked independently of each other and rated each utterance in the soliloquy as to whether it constituted delayed echolalia or propositional speech. This task was performed by assigning each utterance in the context of the soliloquy to one category or the other. If the raters considered an utterance to be ambiguous, the utterance was assigned to both categories simultaneously. This was done to explore the possible interplay between echolalic and propositional speech in the acquisition process.

Explicit definitions and criteria were unavailable. Consequently, the raters were guided in their classification by their conceptualization of these terms as understood through the definitions and descriptions for creative or propositional speech and delayed and mitigated echolalia found in the literature (Dale, 1972; Chomsky, 1972; Geschwind, 1974; Kanner, 1946; Griffith and Ritvo, 1957; Fay 1967b).

Grammaticality

The same raters rated each utterance as to whether it constituted a well-formed utterance of English or whether it was ungrammatical. Utterances which were considered ungrammatical were further rated and analyzed as to the type of ungrammaticality which occurred. This was done to test the hypothesis that the types of syntactic and semantic errors made in the soliloquies serve as a valid index to the level of language development in the autistic child.

In making their judgment on grammaticality, the raters operated with several assumptions. The first was that all utterances heard by the child were spoken by normal speakers of Standard English. Certain unpredictable errors which could have been made by normal speakers of Standard English, and which might constitute an aspect of the stimulus utterance itself, were not taken into account. Allowance was also not made for ungrammatical utterances which the child may have overheard from someone suffering from a language disorder. All ungrammatical utterances were judged to be errors made on the part of the autistic child.

Discourse Analysis

Discourse analysis has been defined as the "study of the linguistic interrelationships between utterances produced in succession by one or more persons in a single situation" (Harris, 1964, p. 357). A discourse analysis was performed on the text of the soliloquies to specify the syntactic, phonological, and semantic relationships between utterances in connected speech. This was done to test the hypothesis that the way in which the autistic child sequenced her utterances provided a medium through which linguistic processes governing the organization, storage, and retrieval of language by the echolalic autistic child can be studied.

RESULTS

Propositional (Creative) versus Echolalic Speech

The results of rating the utterances as propositional or echoic showed that in most instances there was poor interrater agreement in clearly assigning an utterance to one or the other category.

The existing definitions and descriptions for propositional (creative) speech and echolalia did not appear to be useful in determining which of the utterances constituted propositional speech and how instances of propositional speech could be differentiated from instances of delayed echolalia. It became quite evident that unless the original stimulus utterance was also overheard or documented by the individual rater, there were few clues which aided in making the determination. Similar problems were encountered in determining

whether an utterance constituted mitigated echolalia when the utterance was also grammatical. Because of these difficulties, the ungrammatical utterances of the soliloquies appeared to be the most useful in studying the linguistic competence of the autistic subject.

Grammaticality

There was little disagreement among the raters as to whether an utterance was considered well formed or ungrammatical. Only those utterances which were unambiguously rated by all raters as ungrammatical are included in this analysis. The ungrammatical utterances fell into five general categories.

Sentence Fragments of Various Types, Unrelated to Utterances Which Preceded or Followed Them. Examples of these follow:

> ... wristwatch on the couch
> would you ....
> you ....
> and when you ....
> ... story about Christmas

Although these fragments are not just random words in sequence, they were least informative in terms of type of ungrammaticality. They will be disregarded in the analysis.

Utterances in Which Syntactic Cooccurrence Constraints Were Broken. Syntactic constraints govern the cooccurrence of individual syntactic elements in an utterance. In Examples 1 through 3 below, the features of the underlined words are not in agreement with the features of its immediate linguistic context. Each context contains words which determine the selection and cooccurrence of other lexical items. Such words are termed selectionally dominant. The concept of selectional dominance is discussed by Brown, Cazden, and Bellugi. They note that in English the noun governs the syntactic features of its immediate context and claim that "this is not just a convention but a representation of certain facts about sentences." (1970, p. 111). Examples of selectional dominance follow:

1. Have you been a good girl *the* morning?
2. I want *a* water.
3. You sleep *at* daytime.

These examples, described in more detail below, demonstrate that the selectional restrictions of the dominant noun have not been completely observed in the particular context. A hypothetical target word which a speaker of normal English could have intended will help specify the level at which cooccurrence constraints were broken.

In Example 1, "have you been a good girl *the* morning?," the dominant noun *morning* imposes the specification +*demonstrative* on the preceding

determiner. The probable target sentence would thus be, "Have you been a good girl *this* morning?" While a determiner occurs in Example 1, the specification +*demonstrative* has not been observed. The subject thus followed some but not all of the selectional restrictions of the dominant noun:

Possible Target	*Actual Utterance*	*Selectional Restrictions Imposed by the Dominant Noun*
this	the	morning
		+noun
+determiner	+determiner	+determiner
demonstrative	−demonstrative	+demonstrative

Similarly in Example 2, "I want *a* water" (possible target: I want some water), some, but not all of the selectional restrictions of the dominant noun were observed. The selectional restrictions of the mass noun *water* specify that the preceding determiner carry the feature −*count*. Again, the subject appropriately chose a determiner for the determiner slot. However, she did not observe the −*count* restriction:

Possible Target	*Actual Utterance*	*Selectional Restrictions Imposed by the Dominant Noun*
some	a	water
		+noun
+determiner	+determiner	+determiner
−count	+count	−count

In Example 3, "You sleep *at* daytime", (possible target: you sleep during the daytime) the selectional restrictions governing the preposition in the context of the adverbial phrase *daytime* where not observed. However, a preposition was used in the appropriate prepositional slot. The necessary article was omitted also:

Possible Target	*Actual Utterance*	*Selectional Restrictions Imposed by the Dominant Noun*
during	at	daytime
+adverb, time	+adverb, time	+adverb, time
		+during

Utterances in Which Semantic Cooccurrence Constraints Were Broken. Semantic constraints govern the cooccurrence of words in terms of semantic content. Thus in Examples 4 and 5, the semantic features of the underlined words are in disagreement with the semantic features of their immediate context.

4. Tell me *yesterday*. (possible target: Tell me *now*)
5. Would you *bring* your seatbelt on? (possible target: Would you *put* your seatbelt on?)

The level at which the semantic cooccurrence constraints are broken will become clearer from the graphic presentation below:

Selectional Restrictions Imposed by the Semantic Frame	*Actual Utterance*	*Possible Target*
tell me	yesterday	now
+imperative		
+adverb, time	+adverb, time	+adverb, time
−past	+past	−past

In Example 4, while an adverbial of time can and did occur with the imperative, it cannot have the specification +*past*.

In Example 5 "Would you *bring* your seatbelt on?," *bring* and *put on* both appear to be verbs of directional movement. However, *bring* does not fit the context of the particular utterance and cannot occur with the preposition *on*.

Examples 1 through 5 show that the subject failed to observe low-level semantic and syntactic selectional restrictions, while using the correct grammatical category and the appropriate slot for that category in the grammatical string. These examples would support the hypothesis that our autistic subject has, or is developing, some linguistic competence in the presence of echolalia. She knows the slots in the string in which certain grammatical categories such as verbs, adverbs, and determiners can occur. However, she fails to observe the finer syntactic and semantic cooccurrence constraints which normal children acquire in the process of language development.

The following type of errors differs from the preceding examples in that contextual constraints were not observed at a higher level of grammatical structure.

Utterances in Which a Specific Semantic Concept was Expressed but the Syntactic Rules Required by the Immediate Context Were Not Observed. The concept of negation, as it occurs in the corpus, is of interest here. An exhaustive treatise of the syntactic cooccurrence constraints on negation is presented in Klima (1964). Example 6 from our data will serve to illustrate the type of error involving the negative.

6. *No* scratch yourself. (possible target: Don't scratch yourself.)

Examples from our data in which the negative was used correctly and which were judged verbatim delayed echolalia by the raters include:

No spitting.	No more.
I can't understand you.	Don't sit on the couch.
Don't wet your pants.	

These utterances demonstrate the correct use of several variants of the negative particle and illustrate the following rules governing the negative in English:

Negative → no	{ noun phrase	(no spitting)
	{ adverbial	(no more)
→ not	{ modifier and verb	(I can't understand you)
→ do support		
+not	{ imperative	(don't wet your pants)

The error in Example 6, "*no* scratch yourself," appears to indicate that the subject had mastered the semantic concept of negation and recognized the slot for the negative in the grammatical string. However, she did not apply the do support rule, which should have been used in the particular context. This error seems to imply that she had not internalized other more specific, context sensitive rules governing the use of the negative. Utterances from her daytime interaction further support this interpretation:

7. Stimulus: Do you want *some* water?
   Response: I don't want *some* water.

Again, this example shows that the subject understood the negative concept and the appropriate slot in the grammatical string for the negative. What she did not observe were the constraints on the determiner preceding *water* in the presence of the negative particle. According to these constraints, the rules in the choice of the determiner should have resulted in *any* and not in *some* and thus in the correct response, "I don't want *any* water."

Utterances in Which Syntactic Constraints Were Not Observed Across Sentence Boundaries. The following example will demonstrate nonobservance of syntactic constraints at the level of discourse. While it is possible to delete like noun phrases within an utterance by a rule of equinoun phrase deletion, this rule does not apply across surface sentence boundaries. In Example 8 below, it could be conjectured that the two separate utterances S_1 and S_2 were conjoined by the inappropriate use of this rule.

8. Now go and see how much you weigh 64½ pounds.
   S_1: Now go see how much you weigh.
   S_2: You weigh 64½ pounds.

A more plausible explanation would be that in this instance the autistic child observed the phonological shape of the syntactic string without attention to the sentence boundaries. It appears these two utterances were conjoined by blending *you weigh* of S_1 and *you weigh* of S_2, as illustrated below:

S_1: No go see how much you weigh.
↑ ↑
S_2: you weigh 64½ pounds.

All of the above examples suggest that the autistic subject had begun to develop some grammatical competence in the presence of echolalia. This competence appeared limited in some very specific ways. The subject understood and was able to use gross grammatical categories in their appropriate slot in the grammatical string. However, some of the more specific rules governing the syntactic and semantic cooccurrence of linguistic elements which were necessary to produce well-formed utterances had been incompletely acquired or not acquired at all. The above examples seem to show that the echolalic autistic child had specific limitations in the mastery of syntactic and semantic contextual rules. Examples from our discourse analysis will provide further evidence for this claim.

Discourse Analysis

In Weir's sample, utterances on the level of discourse related to each other syntactically, phonologically, and semantically. The same was true of the autistic child's soliloquy.

Syntactic Interrelationships. Weir (1962) described three major devices by which the utterances in sequence were related syntactically. Following Weir, a sequence consists of "more than one unit of speech delimited by pauses . . . . The make up of the speech unit is varied" (1962, p. 81) and may include a complete sentence or only part of a sentence. She called these buildups, breakdowns, and completions. Examples of each follow (Weir, 1962, p. 83):

Buildup	block
	yellow block
	look at all the yellow block
Breakdown	clock off
	clock
	off
Completion	look at those pineapple
	in a pretty box

In contrast to buildups and breakdowns, completions do not contain a repetition of any part of the preceding sequence. Instead, a pause between constituent parts of the utterance is an essential feature.

All three of these devices relate to the syntagmatic axis of language and can be considered roughly synonymous with the processes of expansion or extension and deletion. The process of expansion assumes the unaltered presence of an utterance which serves as a base for the expansion and the addition of some syntactic element or elements to that base. Similarly, Weir defines the characteristic feature of a buildup sequence as follows:

> . . . the original phonemic shape of the initial speech measure (speech unit) is contained in the subsequently constructed longer combination of words. Increasing length is important. Semantic content of the first speech measure (speech unit) as relating to the resultant unit is secondary. Break-downs work in similar fashion

> in the opposite direction . . . . Completions are similar to build-ups, but in this case the comparative length of the units is irrelevant . . . . No repetition of phonemic shape of the first unit is necessary. (pp. 82, 83)

The process of deletion assumes a base utterance and the deletion of a syntactic element or elements in the resultant utterance.

Weir's subject also practiced grammatical patterns involving the paradigmatic axis of language. The latter can be described in terms of a substitution-in-frame technique. The process of substitution assumes a grammatical string, and the substitution of some syntactic element or elements in that string. The remainder of the utterance then becomes the grammatical frame for the utterance. The following example will illustrate substitution practice using a particular grammatical frame (Weir, p. 115):

go for blouse
go for shoes

In the autistic's soliloquies, syntagmatic and paradigmatic relationships between utterances in connected discourse were also observed. Utterances could be interrelated by expansions, deletions, and substitutions. These processes resulted in grammatical as well as ungrammatical strings. While the processes and devices used by Weir's subject and by our subject appear superficially similar, several differences also emerged. These will be discussed below.

Expansions. The following examples will demonstrate the process of expansion as used by the autistic subject.

9. Go to sleep.
   Now go to sleep.
10. I don't see.
    I don't see her.
11. Now you go see how much you weigh.
    Now you go see how much you weigh 64½ pounds.
12. Don't wet your pants.
    Good girls don't wet your pants.

Only Sequences 9 and 10 yielded well-formed utterances of English. In Examples 11 and 12, on the other hand, the contextual rules which needed to be altered in the process of the expansion were not observed. In Example 11, the presence of a sentence boundary was not observed. In Example 12, the rule of person agreement was not observed in the expansion and an incorrect reflexive pronoun was used, although in the correct pronominal slot.

Examples 11 and 12 appear to show that expansion took place by conjoining two independent chunks.

11. now go see how much you weigh + you weigh 64½ pounds
12. good girls + don't wet your pants

The fact that some of the rules which governed the expansions were not

observed again indicates that the subject had not internalized linguistic rules in the usual fashion. The process of expansion appeared to consist of conjoining two separate sequences which seemed to have been encoded and conjoined chunk-style.

Expansions by the autistic subject generally took place in initial and final position. However, there were some instances in which utterances were also expanded medially, frequently resulting in ungrammatical strings:

13. I want water.
    I want *a* water.
14. My friend girl.
    My friend *the* girl.

Deletions. The following are examples of deletions by the autistic subject:

15. Don't go home.
    Don't go.
16. I am hungry too.
    I am hungry.

Substitution. Substitution was the most widely used process in sequencing utterances by the autistic subject. A wide variety of frames occurred. The grammatical frame could consist of a single word or of a sequence of words. Substitutions occurred initially, medially, and finally. The substitutions described under each numeral occurred in sequence. Examples of initial substitutions and final frames are:

17. I *got five minutes to eat.*
    You *got five minutes to eat.*
    Now you've *got five minutes to eat.*
18. I am going to put the *seatbelt on.*
    I want to get *your seatbelt on.*
    You're going to bring *your seatbelt on.*
    Would you bring *your seatbelt on?*
    I have to bring *your seatbelt on.*
    I am going to tighten *your seatbelt.*

In Example 17 the grammatical frame consists of "five minutes to eat." In Example 18 the grammatical frame consists of "(your) seatbelt (on)." The grammatical sequences involving *bring* resulted in ungrammatical utterances because the wrong verb was selected for the particular context. It is noteworthy, however, that *bring* and *put* appear to belong to the same category of verbs indicating directional movement.

Examples of medial substitutions and initial-final frames are:

19. *George* get *down.*
    George sit *down.*
20. *Tell me* of *Phillip.*
    Tell me about *Phillip.*

21. *Now* listen *you're going out.*
    Now sit down *you're going out.*

While the substitution in Example 20 is quaint, the substitution in Example 21 results in a somewhat incongruous sentence semantically.

Examples of final substitutions with initial frames:

22. *You had* a drink of water.
    You had it.
23. *You sleep at* nighttime.
    You sleep at daytime.
24. *Now you* got five minutes to eat.
    Now you go and pick that up.

In Example 23, "You sleep at daytime," only the noun was substituted and the preposition left unaltered, again indicating lack of rule internalization. In Examples 18, 21, and 23 the substitutions resulted in ungrammatical strings because the contextual rules which should have been applied in the process of substitution were not observed. This is a significant finding since the resultant ungrammatical sequences reflect the fact that the process of substitution by the autistic child appears to take place by a simple concatenation of two chunks which remain unmodified by contextual rules. These findings point to the conclusion that, if language practice does take place in the soliloquies, such practice appears limited to surface structures. The data show that our autistic subject had acquired the concept of basic grammatical categories, such as noun, verb, determiner, and preposition. She also had acquired the rules to place these categories in their appropriate position in the grammatical string.

The lack of modification of the grammatical frame in the substitution supports the finding that the necessary context-sensitive rules had not been acquired. Lack of context-sensitive rules is also evidenced in the expansions. Examples of expansions from our data show that two separate strings were frequently conjoined chunk-style without attention to their internal structure. This apparent lack of internalization of context sensitive rules is in sharp contrast with the examples for buildups and substitutions discussed by Weir for her younger normal subject.

Phonological Interrelationships. Weir observed her child's apparent pleasure with the sound of words. She noted his predilection for rhythm, rhyme, alliterations, and clang associations. Sound play has been described in terms of the poetic function of language (Jakobson, 1960). The autistic child's soliloquies also provide many examples of sound play. Sound associations were used as a device to sequence utterances in connected discourse. The examples cited occurred in sequence.

25. Don't you *kid* me.
    Don't you *kick* me.

26. That's a *nose.*
    That's *nose business* (no one's).
27. Do you want a *towel?*
    Do you want a *total?*
28. I want to get your seatbelt *on.*
    Honest.
29. I want a drink of *water.*
    Miss *Lauter*
30. When you get back to the *ward.*
    When you get back from a *walk.*
31. *Bye-bye.*
    Take a *bath.*
    I got to go to *bed.*

Some of the above examples show that utterances can be interrelated in several ways. Thus, the sequences under Example 29 can be viewed as substitutions in a grammatical frame. They are also related through clang association. In Example 31, the sequences "bye-bye," "take a bath," and "I got to go to bed" are related by situation or meaning in that "bye-ble" and "take a bath" are associated with bedtime routine. They are further related by initial sound sequence in that they all begin with bilabial stops.

Semantic Interrelationships Between Utterances. The claim has been made that the young child's thought is dominated by paired associations of contrast (Dale, 1972; Wallon, 1945). In child language acquisition, paired associations may become particularly evident in the semantic development. Weir remarked on the phenomenon of paired associations in her subject's soliloquies. While the autistic child's soliloquies gave only very limited evidence of true semantic contrasts, utterances were interrelated by semantic associations of various dimensions. These must be taken to reflect at least the beginnings of some limited semantic development in the presence of echolalia. The following examples, all occurring in sequence, will demonstrate semantic interrelationships.

32. You sleep at *daytime.* You sleep at *nighttime.*	This example represents a paired semantic association of contrast *(day—night).*
33. Take a *shower.* And you take a *bath.*	The italicized words belong to the same functional category and share semantic features.
34. Bye-bye Miss American *Pie.* Nice *eating*	*Pie,* in its literal sense, is an edible and thus related by function to *eating.*
35. *Put* the seatbelt on. *Bring* the seatbelt on.	*Put* and *bring* are verbs which seem to share certain sematic features of directional movement.
36. You want a *towel.* All right—*a big one.*	Modifier of size *(big)* can be an attribute of *towel.*
37. *Bye-bye.* *I am going for a ride.*	The two utterances are related by context of situation.
38. *My friend girl.* *You're my honeybunny.* You want a *doughnut.* You want a *doughnut for dessert?*	*Friend girl* is related by extension of meaning to *honeybunny. Honeybunny* in turn is related as an edible to *doughnut* and *dessert.*

DISCUSSION

Our initial hypothesis had been that the autistic child develops more adequate verbal behavior based on echolalia through processes which may be different from those observed in normal language development. The approach used to test this hypothesis was the linguistic analysis of bedtime soliloquies. We were primarily concerned with qualitative rather than quantitative aspects of the data.

We had expected that the concept of delayed echolalia would play a significant role in the analysis of these soliloquies. In attempting to separate delayed echolalia from propositional speech, we found that reliable judgments could not be made using present definitions and descriptions. Since claims of instances of delayed echolalia abound in the literature on autism, there is obviously a need for a more thorough study of the phenomenon and for refining the definition. A study of the syntactic features and the semantic content of an utterance may well hold considerable promise in such an endeavor.

Weir, in her study, only analyzed those utterances which she considered propositional and apparently did not encounter these difficulties in differentiation. Perhaps the more rudimentary nature of linguistic rules commonly associated with the age level of her subject made it easier to make this distinction. However, she was also aided by additional information since the rules used by her subject mirrored daytime verbal activity. Our subject was older, and an adequate comparison with daytime verbalizations was not possible since these were quite limited. Therefore, in contrast to Weir, our own data may have consisted primarily of delayed echolalia.

The dimension of grammaticality proved a useful indicator of the direction of language development and the limitations on language function. These limitations which appeared quite pervasive are revealed in the types of ungrammaticality seen. Basically, these can be characterized in terms of nonadherence to specific context sensitive semantic and syntactic rules.

The discourse analysis proved informative in several respects. The extensive verbalizations in the autistic soliloquies indicate that, much like the normal subject, the autistic child also appeared to engage in some type of linguistic pattern practice and seemed to take pleasure in the sounds of language and the manipulation of linguistic units.

Weir had described the discourse of her subject in terms of the child's dialogue with an imaginary interlocutor in which the child alternated between the rules of the speaker and the listener. The soliloquies of our autistic subject showed no evidence of such a dialogue and no alternation took place. This finding may not be surprising if the autistic disorder is viewed as a disturbance of affective contact where impairments in the interpersonal area are among the chief characteristics. The lack of dialogue structure in the soliloquy may be a reflection of an inability to establish interpersonal relationships.

Weir also found that each of the soliloquies of her subject was governed

by a "Leitmotiv," an overriding theme which recurred throughout the soliloquy. We found this also to be true of the autistic child's soliloquies. Different soliloquies had different themes. In addition, several subthemes were encountered in our subject's soliloquies. Frequently there was an abrupt change in topic between these subthemes.

As in the normal subject, our autistic subject interrelated sequences phonologically, syntactically, and semantically. In structuring her discourse, she also used the processes of expansion, substitution, and deletion. The ungrammatical sequences which resulted from those processes provided evidence of limited, faulty, but usable language function. A study of the linguistic characteristics of these sequences points up the more specific nature of the linguistic deficit. Sequences resulting from expansions and substitutions show that the autistic subject used those processes in a manner different from the normal subject in that she appeared to conjoin linguistic chunks of different sizes. In so doing, she demonstrated an operational knowledge of constituent structure, grammatical and functional categories, and the correct slot of these categories in the grammatical string. What was absent was a lack of attention to the internal structure of the resultant sequences. Thus the utterances so conjoined were frequently ungrammatical. The absence of the necessary context sensitive rules appears to show only surface structure operations without attention to deep structure.

These findings support the hypothesis that the echolalic autistic child develops language by means of linguistic strategies which may be different from those of the normal child, or which may represent only a small fraction in normal development. It would appear that the echolalic autistic child does not acquire language in terms of a gradually expanding system of linguistic categories and rules. It seems more probable that quotationlike or rote-learned echolalic patterns are only gradually broken down into individual chunks of varying sizes. These chunks are then conjoined and frequently result in new utterances which can be considered delayed mitigated echolalia. These new formations are most often characterized by the absence of context-sensitive rules and result in ungrammatical utterances.

Our overall conclusion is that the analysis lends support to our initial hypothesis that the echolalic autistic child appears to develop a limited but usable linguistic system which is based on echolalia. As the child matures, his language ability also matures, but the particular deficit of poor or absent internalization of context-sensitive rules continues to be reflected even in adolescence and young adulthood. In terms of practical application, the results of our analysis would not advocate the extinction of echolalic verbal behavior prior to therapy. Rather, the results would support language therapy programs which are based on, and incorporate, existing echolalic patterns.

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