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Music in the Assessment and Treatment of Echolalia

KENNETH E. BRUSCIA, Ph.D., C.M.T.

Echolalia is generally defined as the tendency to echo or repeat the speech of others. Although frequently related to other repetitive behaviors, echolalia can be distinguished from echopraxia, which involves motor rather than verbal imitation (Schuler, 1979), from palilalia, which involves verbal imitation of oneself rather than others (Boller, Albert, Denes, 1975), and from perseveration, which involves several repetitions of a single act rather than single repetitions of several acts.

Even when delimited to verbal, nonperseverative imitation of others, echolalia is an exceedingly complex and diverse phenomenon. Echolalic behaviors differ within and between individuals along several dimensions or variables. One most often used to differentiate echolalic behaviors is the timing of the response, or when the echo occurs in relation to the original utterance. In "immediate echolalia," the verbal echo occurs immediately after the original utterance, whereas in "delayed echolalia," the echo occurs hours, days, weeks, or months after the original utterance (Freeman, Ritvo, & Miller, 1975). This distinction naturally becomes obscure whenever the length of lapsed time is more than a few seconds but less than an hour, and especially when other utterances have intervened between the original utterance and the echo.

A second variable that differentiates echolalic behaviors is the degree of similarity between the echo and the original utterance. In "pure echolalia," the echo is a precise, literal, and complete repetition; in "mitigated echolalia," the echo is a shortened, lengthened, restructured, or otherwise modified version of the original utterance (Fay, 1967). Here, the distinction depends upon how many aspects of the two utterances are compared, (i.e., whether the words, grammar, syntax, intonation, and/or prosody are compared). Examples of mitigated echolalia included "telegraphic speech"

wherein the echo contains only those words or morphemes of the original utterance that were stressed by the speaker (Simon, 1975), and “negative echolalia” in which the echo is a verbatim reproduction but with intonational changes that suggest hostile affect (Freeman, Ritvo, & Miller, 1975).

A third variable that differentiates echolalic behaviors is selectivity, or the conditions under which echolalic responses are given. When echoing occurs indiscriminately (i.e., after every utterance, with every speaker, or in a completely random fashion), the echolalia is regarded as “automatic”; when the echoing occurs discriminately (i.e., only after certain utterances, with certain speakers, or according to any pattern), it is regarded as more or less “selected” (Schuler, 1979)

Finally, the least observable variable differentiating echolalic behaviors is its functionality, or the extent to which the echo serves a meaningful and appropriate purpose. When echolalic responses are given within an appropriate context, for purposes of communication, information processing, or adaptation, they can be regarded as functional. When echolalic responses are not context-sensitive and serve no discernable purpose, they are regarded as non-functional. Although specific terminology has not been adapted for these functional variables, Kanner (1946) used the term “metaphoric speech” to refer to meaningful or communicative echolalia.

NORMAL ORIGINS

Echolalia is generally regarded as a normal response tendency for two reasons. First, echolalic behaviors can play a functional role in normal development and learning. Second, echolalic behaviors can be meaningful, interactional responses within certain situational contexts.

Several writers have pointed out that normal children exhibit echolalic tendencies during certain phases of development, and that these tendencies serve *important developmental functions*. Although children differ in the extent to which they depend upon imitation (Ramer, 1976), and although the imitative process itself develops (Piaget, 1962) and changes according to its developmental function (Ramer, 1976), a high frequency of verbal imitation is usually found in children between the ages of 1 and 4 years (Myklebust, 1957; Nakanishi & Owada, 1973; Piaget, 1962, Ramer, 1976).

During these years, verbal imitation may serve a variety of developmental or learning functions by helping the child to acquire speech perception and production skills (Carluccio, Sours, and Kolb, 1964), learn new vocabulary (Nakanishi & Owada, 1923), understand the relationship between inner experiences and verbal symbols (Myklebust, 1957), assimilate new experiences and symbols into existing structures (Myklebust, 1957), learn

various aspects of grammar and syntax (Simon, 1975; Schuler, 1979), develop object concepts (Piaget, 1962), differentiate self and other (Piaget, 1962), develop social awareness and turn-taking skills (Schuler, 1979), gain skill in identifying or empathizing with others (Myklebust, 1957), and learn various other conversational and interactional skills (Schuler, 1979). In addition, young children frequently use echolalia as a means of self-gratification (Carluccio et al, 1964), to evoke parental response (Carluccio et al, 1964), and as a way of prolonging and mastering their visual and auditory experiences (Piaget, 1962).

Although echolalic behaviors peak in frequency during the early developmental years, they continue throughout the life span (Miller, Galanter & Pribram, 1968) and serve some rather useful functions, particularly in the area of conversational discourse. Some of these functions include expressing reciprocity, sustaining a discourse, affirming or re-emphasizing the other person's utterance, and requesting an explanation or elaboration from the other person (Schuler, 1979). Echoing is also used as a stall tactic, when responding to a ticklish question or challenging comment (Carluccio et al, 1964).

With the attainment of speech, echoic responses can also begin to take on mocking functions (Carluccio et al, 1964). For example, adolescents frequently mimic their parents and teachers, probably as a means of resolving the usual conflicts with authority. They also use echoing to mock their peers, serving sometimes as a form of rejection and other times merely as a joke. In the adult world, echolalia is commonly used in the service of humor (Carluccio et al, 1964)—witness the number of comedians and pantomimists who use mimicry and imitation to poke fun at well-known people.

In addition to serving functions related to language and information processing, echoic and imitative forms also play an important part in music. Vocal compositions, for example, frequently contain instances of echoing words and/or musical phrases; in instrumental compositions, echoing musical phrases is also common. In addition, many standard forms of musical composition are based on echoic devices and can even be described with echolalia terminology. A strict canon can be described as immediate pure echolalia between the voices. A fugue can also be depicted as immediate echolalia, with "real answers" providing examples of pure echolalia, and with "tonal answers" and canonic diminutions or augmentations providing examples of mitigated echolalia. When the typical song with refrain is performed antiphonally, the verses become delayed mitigated echolalia, while the refrain is delayed pure echolalia. Incidentally, one difference between echoing in music and language is that in musical counterpoint an echo can begin before the model is completed, and by overlapping in time make a meaningful statement with the model;

whereas, in verbal echolalia, the echo usually occurs after the model is completed because utterances overlapping in time are not meaningful. In short, echoes overlapping in time are more meaningful in music than in language.

Echoic behaviors are also indigenous to various types of musical interactions. In improvisation, the echo is used to affirm, clarify, or reinforce the other person's motif or theme. In instructional situations, echoing is a procedure that enables the student to sing a melody or play a composition by ear. In fact, rote singing and other forms of musical imitation are basic tasks in the music classroom. In private teaching situations, the student is frequently encouraged to mimic the teacher's playing or interpretation. And finally, the echo often is used in music therapy as a means for the therapist to demonstrate awareness, empathy, and acceptance of the client and his musical offering.

PATHOLOGICAL ORIGINS

Echolalia appears to be a normal phenomenon when all of the following conditions are met: 1) the frequency and intensity of the responses are developmentally appropriate, 2) the responses are exhibited selectively and serve a certain function; and, 3) the function served is beneficial to the person, and appropriate or adaptive within the situation. Conversely then, echolalia can be considered pathological: 1) when it is excessively frequent or intense; 2) when it is unselective or nonfunctional; 3) when it is detrimental to the person; or 4) when it is situationally inappropriate or maladaptive.

Another distinction between normal and pathological echolalia is that the latter is associated with various clinical syndromes, most of which involve some type of organic impairment (Carluccio et al, 1964). Although most often associated with childhood autism (Kanner, 1946), mental retardation (Critchley, 1964), brain injury (Goldstein, 1939), and schizophrenia (Carluccio et al, 1964), Schuler (1979) has reviewed reports linking it to dementia, Pick's atrophy, postepileptic and confusional states, startle or fright neurosis, adult aphasia, Gilles de la Tourette syndrome, and lesions in several specific areas of the brain. Interestingly, in reviewing this literature, Schuler concluded that echolalia remains a poorly defined clinical phenomenon and that there is growing uncertainty regarding its usefulness in the differential diagnosis of associated disorders.

Since echolalia is observed in many diverse clinical populations, each with its own symptomatology, various explanations have been offered for its etiology and how it fits into the total clinical picture of an individual. In examining the relationship of echolalia to autism, Simon (1975) speculated that autistic children probably suffered asphyxia during birth which caused

permanent damage to the tectum (inferior colliculi), a part of the brain responsible for sensory processing and selective auditory attention. As a result of these auditory processing problems, autistic children often fail to develop the speech perception skills necessary for understanding language as well as the social awareness necessary for communication. Hence, forms of noncommunicative speech, such as echolalia, develop instead.

Noting that autistic children frequently fail to imitate intonational and prosodic features of utterances, Simon also proposed that these children are unable to perceive intensity-time aspects of speech, which provide information on word and phrase boundaries and on morphemic stress patterns. As a result, they do not learn the grammatical and syntactical rules necessary for the development of language comprehension and spontaneous speech. Incidentally, Simon also attributes the unusual musical abilities sometimes observed in autistic children to neurological integrity in those areas of the brain responsible for associational and rote memory and pitch-time perception.

Echolalia is also commonly observed in mental retardation, especially in the lower functioning levels. As in autism, it is often explained in terms of inadequate speech and language development that stems from some type of organic impairment (Schuler, 1979).

Several investigators have attempted to link echolalia with damage to specific areas of the brain. Based on Schuler's review of the literature (1979), the following areas have been implicated: thalamus, midbrain, frontal lobe, temporal lobe, septal area, and hippocampus. Moreover, because such brain injury sometimes leads to aphasia, echolalia is frequently linked to disorders in receptive language, inability to generate propositional language and motorically plan spontaneous speech, and problems in response inhibition or impulse control.

So far in this paper, the clinical categories of echolalia have included only populations with severe limitations in speech or language. In schizophrenia, one of the most interesting aspects of echolalia is that it is exhibited by individuals who use oral language fluently. Carr, Schreibman, and Lovaas (1975) found that a group of schizophrenic language-delayed children exhibited echolalia when confronted with incomprehensible verbal stimuli but responded appropriately to comprehensible stimuli. Moreover, when taught an appropriate response to the incomprehensible stimuli, these children stopped responding echoically.

On the other hand, Carluccio, Sours, and Kolb (1964) observed echolalia in an adolescent and an adult schizophrenic who used oral language fluently. Emphasizing the mocking nature of their echolalia, the authors pointed out that in echolalia, "the speaker is unmasked by the mocker." As such, it is a "rejection of the speaker, a symbolic expression that the speaker's communication is returned to him in an undigested state" (p. 628).

According to the authors, echolalia used in this way involves the psychodynamic mechanisms of regression, identification, displacement of anger, passive aggression, denial, and hostility. In addition, when directed toward the therapist, echolalia provides evidence and information on the individual's "transference."

Another interpretation of echolalia in schizophrenia was offered in Kraepelin in 1919. He related various types of echo-reactions to "command-automatism," which is the indiscriminate and immediate obedience with which schizophrenics sometimes respond to instructions.

Other clinical examples of echolalia which are not directly related to speech or language deficits occur within the context of altered states of consciousness or reduced vigilance (Schuler, 1979). The most unusual incidence of echolalia within this context is the Latah-reaction, a hypnotic state induced by extreme fear, frequently observed in Malaysia and Indonesia (Yap, 1952). Echolalia has also been observed in epileptics as they regain consciousness (Stengel, 1947), following hypoglycemic comas (Stengel, 1947), in confusional states resulting from toxic poisoning (Schuler, 1979), in sleep intoxication (Yap, 1952), and in states of clouded consciousness following abrupt awakening (Yap, 1952).

As is apparent, descriptions of pathological echolalia differ considerably, not only according to the population observed and the philosophical bias of the observer, but also according to whether the focus is psychological or neurological, and interactional or linguistic. Recognizing these differences in perspectives is important for two reasons. First, they prevent the possibility of using a single, unitary concept to explain echolalia across different populations, or for that matter, across different individuals. Second, embedded in each perspective is a germinal idea for a method of treatment.

Since a musical method of treatment will be presented in this article, and since the idea for this method grew out of a musical analysis of echolalia, an examination of what might make echolalia pathological from a musical perspective is necessary at this point.

Musical form is the study of how musical ideas unfold in time. As soon as one musical idea is completed, several options for continuation arise. To echo or repeat the musical idea (a-a) is one important option, although there are several other options of equal importance, i.e., to vary (a-a'), to continue or complete (a-b), and to contrast (a-x). With regard to musical form, the act of musical creation requires what the existentialists would call the power, will, and freedom to choose among several options for continuation. Consequently, the exclusive or excessive use of only one response or form option can be viewed as a limitation in the power, will, or freedom necessary for creative musical interaction. Similarly, echolalia can be defined as the exclusive or excessive use of one response-form option for continuing a verbal interaction, signifying a limitation in the power, will, or freedom

necessary for interpersonal communication. In either case, by not manipulating the form of the musical or verbal interaction, the echolalic individual does not participate in the creative act. Moreover, since the creative act involves another person, the echolalic individual does not participate in the communicative act as well.

In comparison to most linguistic analyses of echolalia, this perspective has some notable differences. First, by emphasizing its form-related implications, the echolalic response is viewed not only as a repetition of an idea, but also as the completion of a meaningful interactional unit (*a-a*). Second, the actual content of the idea, either in its original presentation or echo, has relatively little significance except as it bears on the form of the response. That is, the pathology lies in the over-use of a response form rather than in the inappropriateness of its content. Finally, by linking it to creativity, echolalia is viewed as "being stuck," either willingly or unwillingly, on one response option. In other words, it is a lack of creative and interactional freedom.

THERAPEUTIC INTERVENTION

The literature contains several case studies that outline procedures for modifying echolalia. In most cases, the subjects were speech- or language-delayed children diagnosed as mentally retarded or psychotic, and in nearly every instance, behavioral techniques based on operant principles were employed. Behavior techniques apparently are considered particularly useful with these types of clinical cases because etiological factors are often obscure or irreversible, and because echolalic behaviors themselves preclude the possibility of treatment approaches that depend on verbal communication between therapist and client. Also, the extreme limitations in behavior repertoires often found in echolalic subjects and the recalcitrancy of their echolalia pose methodological problems that seem particularly well-suited to behavioral intervention.

During the initial stage of behavioral intervention, a primary objective is usually to elicit or teach nonecholalic responses. Risley and Wolf (1966) found two techniques to be useful: behavior shaping (for subjects with limited behavioral repertoires) and imitation training (for subjects who already had the target response in their behavioral repertoire). In behavior shaping, the subject is initially reinforced for any behavior resembling the target response, and then through successive steps, is reinforced more discriminately until the behavior more closely approximates the target response. In imitation training, the subject is initially reinforced for imitating the target response, and then gradually is reinforced only for giving the target response without any verbal prompting.

More specifically, Risley and Wolf presented the subject with a picture stimulus, verbally prompted the target response, and then reinforced the subject for imitating the target response. After the subject had learned the imitative response, the authors "faded" out the verbal prompt by using "anticipation procedures." That is, they presented the picture, waited, and then reinforced the subject only when the target response was given before or without the verbal prompt. In an attempt to shorten this procedure, Ausman and Gaddy (1974) used question-answer sets, presenting the question softly and the answer loudly. After the subject had learned the entire set, the authors presented the question softly and then reinforced the subject only for giving the answer without repeating the question.

Another objective sometimes adopted at the onset of treatment is to decrease or eliminate echolalic behavior. Aside from arguments for and against the use of certain extinction procedures, especially for nondestructive behaviors, a major consideration is the effect of such efforts on the subject's overall verbal behavior. If most or all of the subject's verbal output is echolalic, then eliminating all echolalic behavior is tantamount to extinguishing all verbal behavior. On the other hand, because this is not always the case, clinicians have found several instances in which extinction efforts are therapeutically effective, especially when combined with other procedures. Various techniques have proved useful, including punishment (Palyo, Cooke, Schuler & Appoloni, 1979; Tucker, 1977), time-out from reinforcement (Risley & Wolf, 1966), and differential reinforcement of incompatible responses (Risley & Wolf, 1966).

An approach that combines efforts to establish nonecholalic responses and eliminate echolalic behaviors is instating a "general alternative response". The procedure essentially consists of discovering the types of verbal situations that trigger echolalic responses, and then teaching the subject one or more nonecholalic verbal responses that can be used instead. Inasmuch as research consistently shows that echolalia is often triggered by utterances that are not comprehended by the subject, and especially certain types of questions (Fay, 1975; Carr, Schreibmann, & Lovaas, 1975), several clinical researchers have successfully reduced echolalia by training subjects to respond "I don't know" whenever confronted with a question they do not understand (Carr, Schreibman, & Lovaas, 1975, Tucker, 1977; Schreibman & Carr, 1978).

Once nonecholalic behaviors are established, the next phase of intervention can begin. In this phase, efforts are directed towards extending the trained nonecholalic response to other untrained situations (i.e., stimulus generalization) and extending the subject's nonecholalic repertoire from trained responses to untrained ones (i.e., response generalization). Procedures for achieving generalization typically entail "fading" in new stimuli and reinforcing the subject for extending the trained

response to these stimuli (Risley & Wolf, 1966), or teaching the subject to respond differentially to various stimulus categories (Carr, Schreibman, & Lovaas, 1975). That is, the subject is taught to respond with either nonverbal compliance, "I don't know," or a spontaneous verbal reply, according to whether the stimulus was a comprehensible or incomprehensible command or question.

In contrast to these behavioral techniques, the case studies of Carluccio et al (1964) suggest that a psychodynamic approach may be effective in treating echolalic clients with more advanced linguistic behavior. According to their analysis, echolalia signified the client's "transference" onto the therapist, a phenomenon in which the therapist is perceived and treated as though he or she were a significant person in the client's life. As such, there are at least two possibilities of intervention, either not allowing this particular transference to take place, or working through it. Avoiding the transference will short-circuit the echolalia and provide an immediate, short-term remedy, whereas working through it will take considerable time, especially if therapy is verbal and thereby continually disrupted by the client's echolalia.

In 1975, the present author, along with two speech therapists and another music therapist, developed a treatment program for a severely echolalic adolescent. Although the program incorporated the same phases of intervention found in the behavioral approaches, it did not employ reinforcement schedules or other techniques of behavior modification. On the other hand, due to the client's level of functioning and the severe limitations in his oral language, considerable emphasis was given to observable aspects of his verbal behavior, and psychodynamic interpretations were not employed. What follows then is a case study outlining an interdisciplinary treatment for echolalia using music.

CASE STUDY

Assessment

M. was a 14-year-old institutionalized male Caucasian. His IQ and adaptive behavior level indicated severe mental retardation, and previous psychiatric evaluations had cited autistic tendencies stemming from neurological impairment. Evaluations of his speech and language development showed that although M. had the potential to function at a 6-year-old level, severe communication problems prevented him from doing so. The most pervasive problem was that over 95% of his verbal responses to others were echolalic.

M.'s echolalia was immediate, pure, and automatic. That is, he gave immediate verbatim reproductions of the other person's utterance, regardless of who the speaker was and whether the utterance was a

statement, command, or question. Only two modifications were observed in his echoes: he only echoed the final segment of long utterances and never imitated intonational and prosodic features of an utterance. A typical conversation with M. went as follows: "Hi, M.!"—"Hi, M.!"—"How are you?"—"How are you?"; "Let's play some music together"—"Music together"; "Don't echo me"—"Don't echo me." M.'s echolalia was most intense and persistent in one-to-one situations in which the interaction was essentially verbal in nature.

M.'s verbal behavior was further limited in that his spontaneous, self-initiated utterances consisted exclusively of requests for food or his favorite record. He never asked questions or made statements. All of his requests began with "I want" followed by the name of the desired object, and ended with a repeat of the same statement without the pronoun (i.e., "I want record, want record."). Thus, his verbal behavior was palilalic or self-repetitive as well as echolalic, and extremely limited in communicative function.

In contrast to the noncommunicativeness of his verbal interactions, M.'s nonverbal behavior suggested a greater interpersonal awareness than expected and some willingness to interact with others. He frequently established eye contact when speaking or being spoken to, and although he did not touch others, he did allow others to touch him and display affection towards him. It is also noteworthy that, despite the echolalic nature of his verbalizations, M. tried to respond to others whenever he was addressed. In fact, when addressed, his facial expression changed to what appeared to be fear; and when he echoed, he would stare at the speaker and sometimes even cowl, giving the impression that he was afraid the speaker would discover that he did not understand what was said. In this way, his echolalic responses seemed to be an attempt to please others by convincing them that he was attending and understanding them. It was discovered later that his parents overestimated his language comprehension and chastised him for "disobedience" whenever he failed to respond appropriately to their verbal commands.

M. was referred to music therapy because of his obsession for listening to records. The speech therapist requested that M.'s echolalia be explored within musical contexts and possible therapeutic approaches. M. was assessed in three individual sessions wherein he was presented vocal, instrumental, and motor-rhythmic tasks which involved initiating, maintaining, organizing, manipulating, imitating, synchronizing, reciting, and monitoring musical sounds and patterns. Various types and levels of instruction were given, including physical manipulation, modeling, verbal directions and cues, and musical stimulation. The major findings were:

1. M.'s vocal behavior consisted entirely of monotonic speech utterances. He did not initiate sustained voice sounds or discrete pitches, nor did he

vary the intonation of his speech (or echoes) to produce tonal contours. Regardless of the task or type of instruction, M. did not imitate single sustained pitches or melodic phrases, or sing along with live or recorded music. In short, M. did not use his voice for expressive/musical purposes. M.'s closest approximation to singing behavior was exhibited when listening to his favorite record, "Chim-chimeree." As he listened (and rocked), he would speak in monotone a truncated version of the title (viz., "Chim-cheree-cheroo") every time the title occurred in the song, but at twice the speed, and with a one-beat delay. Since this did not occur in response to any other musical or verbal stimuli, it was not regarded as delayed echolalia.

2. M. initiated sounds on most types of simple rhythmic instruments without modeling, and therein demonstrated some understanding of their manipulation and function. The mean length of response on these instruments was five sounds, which were not organized into pulses or rhythmic patterns. M. also initiated sounds on the reed horn and harmonica, most of which were approximately 1 second in duration. Regardless of the task or type of instruction, M. did not imitate single tone durations, pulses, speeds, or rhythm patterns, and did not maintain any instrumental response long enough to play synchronously to live or recorded music.

3. M.'s motor-rhythmic behavior consisted largely of rocking for long periods, at the metronomic speed of ♩=72 in a seated or standing position. Rocking typically occurred when listening to music, when left idle, and immediately before panic reactions of running out of the room or building (which occurred frequently). When rocking during music, M. did not synchronize to the pulse speed of the music or changes therein. When so instructed, M. would clap his hands, but as in the instrumental responses, he would not establish or maintain pulses or imitate rhythm patterns.

4. M.'s preferred musical activity and favorite pastime was undoubtedly listening to the recording of "Chim-chimeree" while rocking and speaking the title. In fact, he requested the recording so persistently throughout the day, and immersed himself so totally in his listening ritual that it was generally regarded as an obsession.

5. Consistent with the speech therapist's findings, when M. was engaged in musical tasks where the interaction was nonverbal, his verbal behavior was not echolalic.

6. As in his speech, M. did not echo tonal or rhythmic aspects of the music of others. This lack of spontaneous or directed musical imitation suggested that he lacked the auditory processing skills usually found in children of the same mental age.

7. The mean length of all of M.'s musical responses (i.e., instrumental, motor-rhythmic, and vocal) was five sounds, which corresponds to the mean length of his verbal utterances (in syllables).

Treatment Program

Once assessment data were gathered, the music and speech therapists met to interpret the findings, conceptualize the problem, and establish basic requirements for effective intervention. Several clinical decisions were made before actually designing the treatment program. First, it was agreed that M.'s echolalia was due to a lack of response alternatives rather than an intentional response strategy to avoid interpersonal communication. Based on this conceptualization of M.'s problem, the goal of intervention then became establishing nonecholalic behaviors rather than decreasing echolalic ones. Since verbal interactions with M. always took the form of "a-a," the goal of intervention was to elicit an alternative *form* of verbal interaction, rather than to teach a new repertoire of specific verbal responses. It was also agreed that a "completion" paradigm ("a-b") was the most logical form to introduce first. In its final version then, the objective for intervention was to establish a completion response, "b," when presented with an initial or carrier phrase, "a."

M.'s frequent running away following an echolalic response was interpreted as an indication of his fear of the consequences of echoing, and an indication that he had some awareness of its inappropriateness. Since M. feared the consequences of echoing but did not know how else to respond, and since he demonstrated a desire to please others, it was predicted that he would be motivated to learn new response alternatives, if the environment was safe and supportive. To establish such an environment, it was agreed that M. would not be asked to make any new responses until the desired response had been modeled sufficiently, and that he would be given praise and affection frequently and spontaneously throughout the program. Since the program's objective was concerned with the interactional form rather than linguistic content of M.'s speech, no attempt would be made to teach him new language skills—all verbal materials employed in the program would be within his existing vocabulary.

Singing was selected as the medium for therapy, based on several considerations. M. was less likely to exhibit echolalia in singing activities than in strictly verbal interactions. Song lyrics offer a richer, more appropriate context for learning "a-b" interactions than does spontaneous speech. The melody of a song makes the words more memorable and the form of the lyrics more meaningful, thereby facilitating the correct verbal response. M. preferred listening to songs over playing instruments or moving (except for perseverative rocking). Two criteria were used in selecting the specific song to be used: The lyrics had to provide an opportunity for carrier phrases and completion responses, and they had to contain vocabulary words M. already knew. Since M. knew how to label colors, Hap Palmer's *Color Song* was chosen and adapted to meet the program's requirements.

Phase One. The first phase of treatment was aimed at establishing the “a-b” interactional paradigm, by eliciting a learned “b” response when presented with its associated carrier phrase “a.” This was accomplished in three steps over five sessions. The music and speech therapists first presented the song several times, modeling how the song was divided into parts and who sang each part. As shown below, the music therapist (MT) sang the introduction and carrier phrases, and the speech therapist (ST) sang the “b” responses, later to be given by the client (C).

MT: This is a song about colors. You see them all around. Oh, the sun is. . .

ST/C: yellow.

MT: Oh, the sky is. . .

ST/C: blue.

MT: And the grass and leaves are. . .

ST/C: green.

Throughout the song, the speech therapist pointed to the person singing thereby establishing a procedure for cueing. After sufficient hearings, the speech therapist began pointing to both M. and herself whenever it was her turn to sing, thereby inviting M. to “speak along” with her. Once M. knew the part, the speech therapist faded out her own singing but continued to conduct the song as the music therapist and M. sang interactively.

The three steps in phase one can be summarized as follows: 1) Two therapists model the “a-b” interaction; 2) The client joins the therapist making the “b” response; 3) The therapist’s “b” response is faded out. In comparison to previously developed procedures, the present method has several unique features. Instead of using complete sentences as stimuli, an incomplete utterance or carrier phrase is used, thereby enabling the client to complete or close a meaningful idea or interactional unit. Instead of having one therapist model both utterances, two therapists are used, one for each utterance. Instead of teaching the target response through immediate imitation (which can reinforce echolalic behavior), the present method relies on deferred imitation. In fact, the client is never given an opportunity to imitate the therapist immediately. Finally, this method employs simultaneous modeling by the therapist.

Phase Two. The second phase was aimed at lengthening the “b” response. This was accomplished in three sessions through the same modeling, cueing, and fading procedures employed in phase one. As shown below, M.’s response was lengthened to a maximum of five syllables which, according to previous assessment findings, corresponded to the mean length of his utterances.

MT: This is a song about colors. You see them all around Oh, the . . .
 ST/C: sun is yellow.
 MT: Oh, the . . .
 ST/C: sky is blue
 MT: And, the . . .
 ST/C: grass and leaves are green.

Phase Three: Recognizing that M.'s nonecholalic repertoire consisted of only three utterances, the third phase was aimed at extending the content of "b" responses while retaining their formal relationship to "a." As shown in the stanza below, different utterances were introduced by changing the lyrics of the song to include new objects and colors that were already in M.'s vocabulary. The same modeling, cueing, and fading-out procedures were used, establishing one-word utterances first, and the proceeding to complete utterances as outlined in phase one and two. The underlinings below show target responses for each phrase

This is a song about colors. You see them all around
 Oh, the ball is red. (or) Oh, the ball is red.
 Oh, the box is brown. (or) Oh, the box is brown.
 And the hat is black and white. (or) And the hat is black and white.

M. completed the third phrase of treatment in approximately six sessions.

Phase Four. Although M.'s nonecholalic responses were increasing, they were predetermined rather than spontaneous. Consequently, the fourth phase of treatment was aimed at introducing him to the possibility of creating his own response by changing the content of "b" while retaining its formal relationship to "a." Put another way, this phase was concerned with generalizing the response paradigm to novel utterances. In order to do this, the lyrics were again expanded to include new objects and colors within M.'s vocabulary. In this phase, however, modeling was discontinued, and a verbal response was elicited from M. simply by cueing him with the new object at the appropriate time in the song. New objects were added to the song at the rate of one per session, thus allowing him to deal with old and new stimuli at the same time.

Phase Five. The final phase of treatment was aimed at eliciting the completion response in a different setting, with different materials, and without the use of a song. In other words, the final phase dealt with stimulus generalization. This was accomplished by ending the joint session, and holding separate music therapy and speech therapy sessions that employed the same principles. In the speech therapy session, a similar verbal routine was developed using picture cards depicting action. The therapist would

present the instructions, model the carrier phrase and target response on the first card, and then present the next card with only the carrier phrase and pointing cue. Meanwhile, the music therapist began teaching M. how to complete rhythm patterns.

Results

After approximately 30 sessions consisting of 5- to 8-minute routines, M.'s echolalia was reduced from 95% of the total utterances within verbal interaction settings to under 10% in any setting, whenever a carrier phrase routine was used employing words within M.'s vocabulary. In the speech therapy situation, M.'s echolalia was reduced to zero. What was most important about the success of these procedures was that new learning became possible for M. and teachers gained a strategy in interacting with him in a meaningful way.

SUMMARY

Echolalia can be differentiated according to structural variables such as timing of the response, similarity between the echo and original utterance, and selectivity of echolalic responding, and according to functional variables such as context-sensitivity, meaningfulness, communicative intent, and purpose of the echo. "Normal" echolalia occurs frequently during the first 4 years of life, when it serves various developmental functions, including the learning of speech, language, object-relations, and social skills. Later, it occurs less frequently but is still used for various conversational and interpersonal functions. Echoing is also indigenous to various musical genres, compositional forms, and activities. "Pathological" echolalia is excessive verbal imitation which is either nonfunctional, detrimental, inappropriate, or maladaptive. It is found in diverse clinical syndromes such as autism, mental retardation, brain injury, schizophrenia, presenile dementia, startle neurosis, and disorders of consciousness.

Important issues in understanding the pathological and etiological origins of echolalia are: 1) whether it involves speech and/or language deficits or interactional problems; 2) whether the oral language deficits involve receptive or expressive skills; 3) whether the interactional problem involves social obliviousness, interpersonal anxiety, or hostility; 4) whether there is gross neurological impairment or lesions in certain areas of the brain; 5) whether the brain damage affects sensory processing, voluntary motor planning, the use of symbols, impulse control, or consciousness; and 6) whether there are existential issues involving power, will, freedom, and creativity. Based on an existential musical analysis, echolalia is considered an excessive or exclusive use of one response-form option that severely limits the possibilities for creative verbal interactions.

Existing approaches for intervention have focused on cases with inadequate speech and language and have relied primarily on behavioral techniques using operant principles; however, the psychodynamic concept of transference may be applicable to cases where there is advanced language behavior. Phases of behavioral intervention typically include: elicitation of the non-echolalic response through behavior shaping or imitation training; extinction of echolalic responses through punishment, negative reinforcement, or differential reinforcement of incompatible responses; fading out of verbal prompting through anticipation procedures; stimulus generalization; and response generalization.

Treatment procedures used in the present case study were aimed at establishing a nonecholalic response form in a severely retarded echolalic adolescent. The procedures involved: modeling "a-b" with two therapists; presenting "a" and cueing "b" while simultaneously modeling "b"; fading out the simultaneous modeling; extending the length of the "b" response; expanding the content of "b" while retaining its relationship to "a," first using learned verbalizations and then using novel utterances; extending the "a-b" paradigm to other interactional settings. A substantial decrease in the percentage of utterances echoed was observed whenever the "a-b" carrier phrase paradigm was used.

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BIOGRAPHY

Kenneth E. Bruscia, Ph.D., C.M.T. holds degrees in both music and psychology and is a Certified Music Therapist. His clinical experience includes working with psychotic adults, geriatric subjects, disturbed adolescents, and the mentally retarded. Presently, he is Coordinator of Music Therapy Programs at Temple University. Having served two terms on the AAMT Board of Directors, as Chairman of the AAMT Education and Training Committee, and most recently as President of the organization, Dr. Bruscia currently serves on the Board of Directors.