

*FUNCTIONAL ANALYSIS AND TREATMENT OF
THE BIZARRE SPEECH OF DUALY DIAGNOSED ADULTS*

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Nine behavior-analytic studies, each reporting data for a single participant, have shown that bizarre speech can be maintained by social reinforcement. In the current study, we controlled for a possible referral bias in this literature by including nonreferred participants with dual diagnoses. Functional analyses identified attention functions for 2 participants and nonsocial functions for the others. Noncontingent reinforcement decreased the bizarre speech of both participants who displayed attention-maintained bizarre speech.

DESCRIPTORS: bizarre speech, dual diagnosis, functional analysis, noncontingent reinforcement

Several recent studies have used rigorous experimental analyses and function-based interventions with single participants to demonstrate operant control over bizarre speech (e.g., DeLeon, Arnold, Rodriguez-Catter, & Uy, 2003; Dixon, Benedict, & Larson, 2001; Wilder, Masuda, O'Conner, & Baham, 2001). Interestingly, each recent study has identified attention as the maintaining reinforcer for bizarre speech. To date, there have been no published cases in which functional analysis indicated automatic reinforcement or nonoperant functions for bizarre speech.

Given the evidence of biological variables involved in many disorders associated with bizarre speech (e.g., schizophrenia; Cannon, Kaprio, Lonqvist, Hutunen, & Koskenvuo, 1998), the aforementioned findings are surprising and could suggest the presence of selection bias in the behavior-analytic litera-

ture. Behavioral researchers may be referred cases with overt social operant features while medical professionals address other cases. The use of multiple nonreferred cases might clarify how often social versus nonsocial variables are involved in the maintenance of bizarre speech and whether functional analyses can be useful in ruling out common social variables. The purpose of this study was to examine the bizarre speech of all available dually diagnosed individuals from a human services agency (to prevent selection or referral bias). A second purpose was to replicate previous studies using functional analysis and function-based interventions for bizarre speech and to examine the collateral effects of noncontingent reinforcement (NCR) on appropriate speech.

METHOD

Participants and Setting

The inclusion criteria were a dual diagnosis (i.e., concurrent mental health and mental retardation diagnoses) and ongoing bizarre speech. The status of all individuals ($N = 120$) at an adult day placement for people with disabilities was reviewed. Informed consent was obtained for 4 of the 6 individuals who met these two criteria.

This study is based on a master's thesis submitted by the first author, under the supervision of the second author, to the Department of Psychology at Western Michigan University. We thank Wayne Fuqua for helpful recommendations regarding the study's methodology and theoretical conceptualization and Craig Suyak for assistance with data collection.

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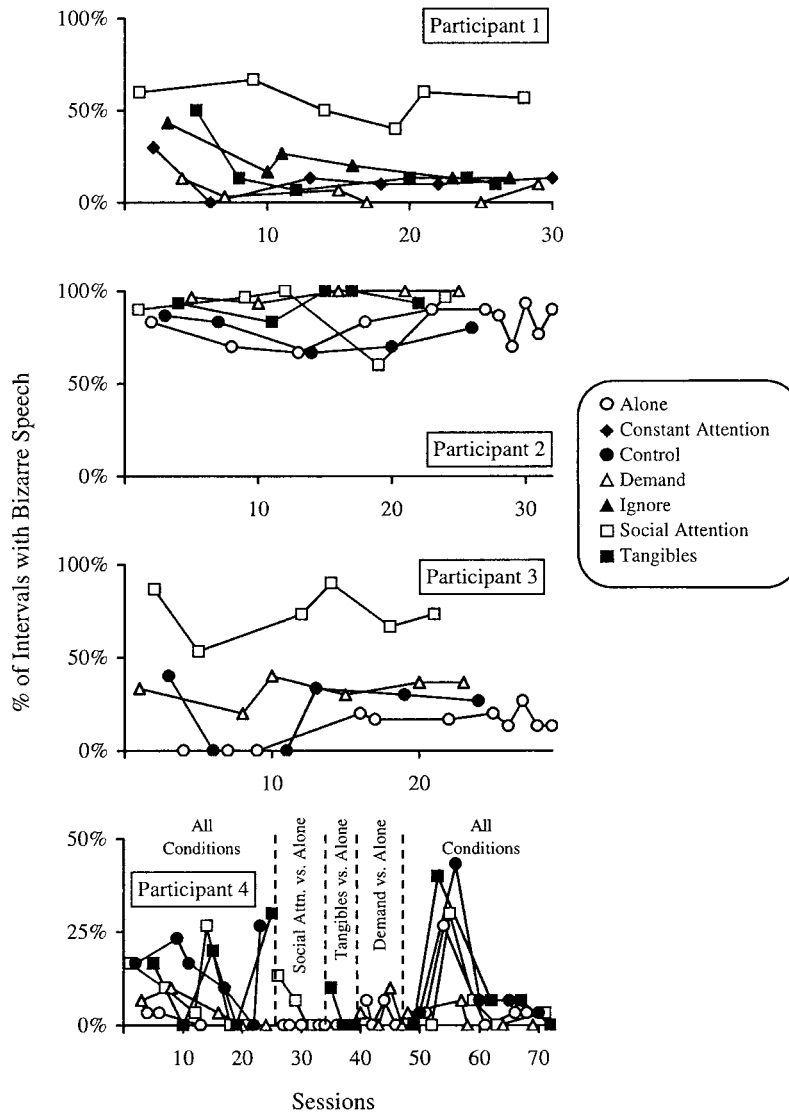


Figure 1. Percentage of intervals of bizarre speech during functional analyses for each participant.

Participant 1 was a 56-year-old woman who had been diagnosed with severe mental retardation and undifferentiated schizophrenia. Her vocabulary was limited to 50 to 75 words, and she used simple two- to three-word sentences to answer questions or make requests. She displayed a variety of bizarre speech patterns including unintelligible conversations with herself, profanities, descriptions of aggressive behavior, grunting, and growling. Her daily medications included thioridazine HCl, trihexyphenidyl HCl, salsalate, lansoprazole SR, naproxen sodium, and sertraline.

Participant 2 was a 52-year-old woman

with moderate mental retardation and undifferentiated schizophrenia. Her vocabulary was limited to 50 to 75 words, and she used simple two- to three-word sentences to answer questions or make requests. She displayed a variety of bizarre speech patterns including unintelligible conversations with herself, profanities, descriptions of aggressive behavior, grunting, and growling. Her daily medications included thioridazine HCl, trihexyphenidyl HCl, salsalate, lansoprazole SR, naproxen sodium, and sertraline.

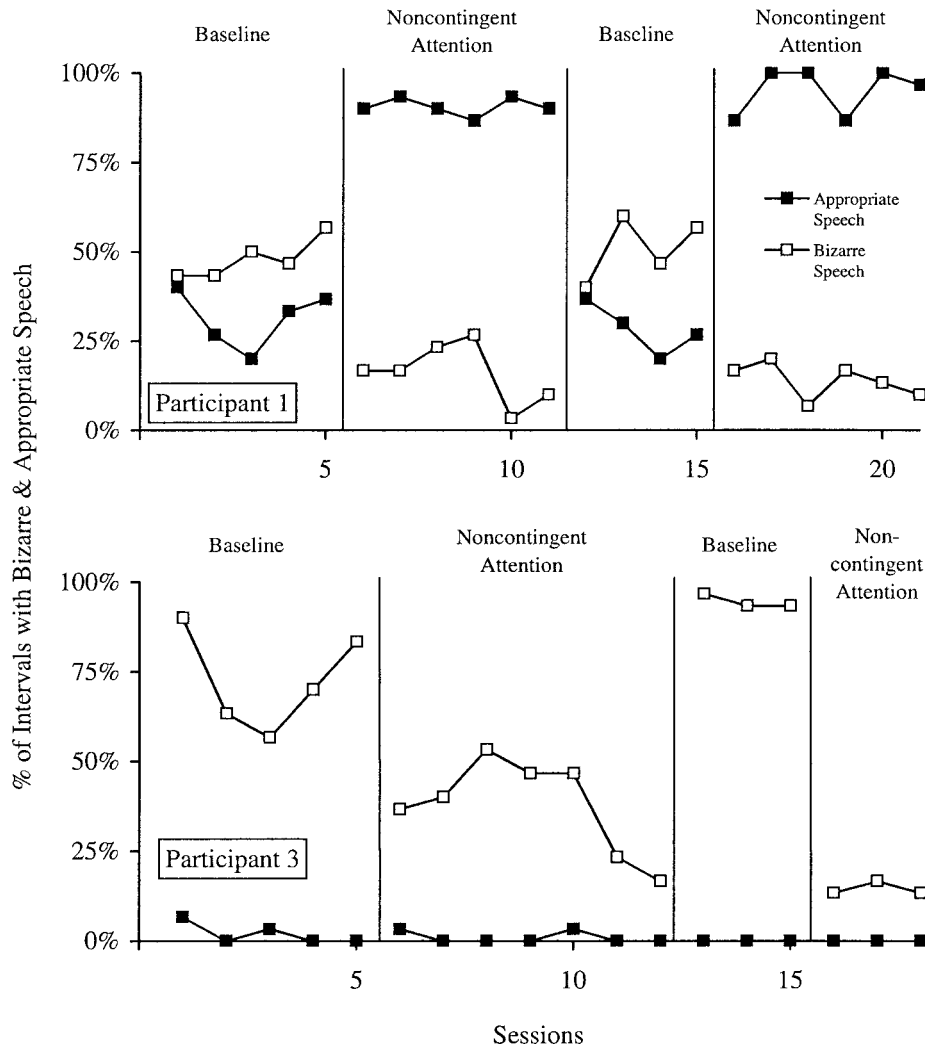


Figure 2. Percentage of intervals of bizarre and appropriate speech during the treatment evaluation for Participants 1 (top panel) and 3 (bottom panel).

Participant 3 was a 53-year-old woman with moderate mental retardation and bipolar disorder. Her vocabulary consisted of 20 to 30 words, and her bizarre speech consisted of one or two words unrelated to her environment that appeared to be fragments of previous conversations. She received ranitidine HCl, estrogens conjugated, docusate sodium, benztropine mesylate, citalopram hydrobromide, and risperidone daily.

Participant 4, a 34-year-old man with mental retardation and bipolar disorder, had a vocabulary of approximately 70 words

used in two- to three-word requests, and his bizarre speech consisted of irrelevant repetitive questions. He was administered daily doses of cabamazepine, thioridazine HCl, risperidone, and fexofenadine.

All sessions were conducted in a therapy room (3 m by 2.5 m) equipped with a wall-mounted videocamera and furnished with a table and two chairs. All sessions were conducted by the first author and were 10 min in length. Approximately six to eight sessions were conducted per day, 2 to 3 days per week.

Data Collection and Interobserver Agreement

Bizarre speech was defined as references to stimuli not present or being discussed, direct addresses to inanimate objects, unintelligible vocalizations, and phrase speech consisting of a string of unrelated words typically referred to as "word salad" (e.g., "they go clang butter better"). Appropriate speech was defined as intelligible and conversational questions, phrases, or statements of fact or opinion relevant to the context (e.g., "Are we going to lunch later?").

Videotapes were scored for the occurrence of each speech category using a 20-s partial-interval recording system. Two independent observers scored at least 33% of sessions from each functional analysis and treatment evaluation for interobserver agreement purposes. An agreement was defined as an interval that both observers scored identically. Agreement was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. Mean agreement across all analyses for all participants was 94.26% (range, 80% to 100%) for bizarre speech and 92.17% (range, 77% to 100%) for appropriate speech.

Functional Analyses

All initial functional analyses were conducted using a multielement design. Subsequent clarifications included several consecutive alone sessions for Participants 2 and 3 to determine if bizarre speech would persist in the absence of social consequences and pairwise comparisons of test conditions and the alone condition for Participant 4 (Vollmer, Marcus, Ringdahl, & Roane, 1995). Demand, social attention, alone, and control, were conducted using procedures described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994), and tangible conditions were added to determine whether bizarre speech was sensitive to tangible re-

inforcement (e.g., Vollmer *et al.*). For Participant 1, the standard control condition appeared to evoke bizarre speech due to schedule effects, as illustrated by Carr and Britton (1999). Thus, an alternative control condition (i.e., constant attention) was conducted with continuous interaction and a 5-s interruption contingent on bizarre speech.

Treatment Evaluation

Participants 1 and 3 had attention-maintained problem behaviors and participated in a confirmatory treatment analysis using baseline and NCR in a reversal design. Baseline sessions were identical to the functional analysis attention condition. Attention delivered during NCR phases consisted of brief social praise such as "I like how you are hanging out today" and was delivered on a fixed-time schedule that was based on the average percentage of intervals in which bizarre speech occurred during baseline.

Procedural Integrity

Procedural integrity data were collected on at least 32% of relevant functional analysis sessions and 32% of NCR sessions (Participants 1 and 3). Therapist responses were scored as correct when the appropriate response occurred within 3 s of the target behavior or the scheduled stimulus delivery. The mean procedural integrity score across participants and analyses was 97.3% (range, 90% to 100%).

RESULTS AND DISCUSSION

Figure 1 shows that Participants 1 and 3 displayed the highest levels of bizarre speech during the attention condition ($M = 55.6\%$ for Participant 1, $M = 73.9\%$ for Participant 3), although bizarre speech persisted in the alone condition for Participant 3, suggesting multiple control by attention and automatic reinforcement. Bizarre speech was undifferentiated for Participants 2 (i.e., high

and stable responding) and 4 (i.e., low and variable). Thus, for these 2 participants, the typical social variables that maintain problem behavior did not differentially influence bizarre speech, suggesting that highly idiosyncratic social variables may have been in effect or that the behavior was maintained independent of social consequences (e.g., automatic reinforcement, reflexive behavior).

Figure 2 depicts the NCR evaluations for Participants 1 and 3. For Participant 1, bizarre speech decreased from 49% of baseline intervals to 15% of NCR intervals while appropriate speech increased from 31% of baseline intervals to 92% of NCR intervals, indicating that NCR would be a viable intervention. For Participant 3, bizarre speech occurred during 81% of intervals during baseline and decreased to 31% of intervals during NCR with no change in appropriate speech. Given that appropriate speech was not influenced by NCR, an additional component (e.g., conversation skills training) would be necessary to promote optimal habilitation.

In conclusion, when referral bias was eliminated, both social and nonsocial functions were identified for bizarre speech. These data indicate that functional analyses can be used both to identify and to rule out common social functions for bizarre speech. Additional studies need to be conducted to investigate which behavioral interventions

might be beneficial when social variables are ruled out, either in isolation or in combination with pharmacological interventions.

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