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FUNCTIONAL ANALYSIS AND TREATMENT OF THE DELUSIONAL STATEMENTS OF A MAN WITH MULTIPLE DISABILITIES: A FOUR-YEAR FOLLOW-UP

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Although delusional statements in people with intellectual disabilities and traumatic brain injury can be treated using behavioral interventions, none have demonstrated long-term treatment effects. In the current study, a functional analysis demonstrated that delusional statements were maintained by attention. Differential reinforcement of alternative behavior and extinction of delusional statements resulted in near elimination of delusional statements and an increase in nondelusional statements. Follow-up at 6 months, 1, 2, and 4 years indicated that treatment gains were maintained with continued staff training.

Key words: delusional statements, differential reinforcement of alternative behavior, extinction, functional analysis, long-term follow-up, traumatic brain injury

Delusional statements are words or phrases that are intelligible but contextually inappropriate (Durand & Crimmins, 1987). Such statements can present challenges for caregivers, increase the likelihood that an individual will be socially alienated, and increase the demands on staff resources. Delusional statements are often considered to be the symptoms of an underlying psychiatric illness and are frequently managed through psychotropic medication (Wilder & Wong, 2007), which can produce negative consequences (e.g., sedation). Many often assume that delusional statements made by individuals with traumatic brain injury are caused by brain damage, especially if delusions were not previously present (McAllister & Ferrell, 2002).

Behavior analysts have demonstrated that environmental consequences may control delusional verbal behavior (Wilder & Wong, 2007). Travis and Sturmey (2008) reviewed several interventions for delusional statements in people with intellectual disabilities and found that many demonstrated that the behavior is sensitive to environmental consequences such as attention (Carr & Britton, 1999; Dixon, Benedict, & Larson, 2001; Rehfeldt & Chambers, 2003) or escape from task demands (Durand & Crimmins, 1987). There are no studies, however, on the effectiveness of a functional analysis and treatment of the delusional statements of an individual with dual diagnoses and traumatic brain damage, and no studies have reported long-term treatment effects. The purpose of this study is to expand the literature by investigating the efficacy of functional analyses to guide treatment development for the delusional statements of an individual with mild intellectual disabilities, frontal lobe syndrome, traumatic brain injury, mood disorder, and mania with delusions over a 4-year period.

METHOD

Participant and Setting

Mr. Jones was a 26-year-old man who lived in an inpatient forensic facility. He engaged in delusional statements that negatively affected his relationships with peers. Specifically, his peers teased him daily, both in residence and workplace, and these statements prevented him

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from participating in several community-based vocational activities.

Mr. Jones's treatment team considered his delusional statements to be a symptom of traumatic brain damage because he had not exhibited any delusional statements prior to a car accident at the age of 16 years. He received 160 mg of Geodon and 1,000 mg of Depakote daily throughout the course of the study.

The therapist conducted all functional analysis and treatment sessions in a private room (3.05 m by 3.05 m) at Mr. Jones's vocational workshop setting. The room contained a small table, two chairs, an analogue wall clock, and a one-way observation window.

Procedure

Response measurement. Delusional statements were utterances that were obviously false and noncontextual (e.g., "Britney Spears is coming to see me this weekend"). Nondelusional statements were utterances that were syntactically correct, were not bizarre, and were not strange or out of context. A statement was counted when at least 3 s passed from the end of one statement to the beginning of another. Examples included statements about a television show or news story that Mr. Jones had watched and statements about his plans for the day. If he made a statement that contained content of which the observer was uncertain (e.g., about the content of the news or television show), the observer assessed the accuracy of this statement by asking other staff members if they could confirm or contradict what Mr. Jones said. A unanimous confirmation by two or more staff members counted as a nondelusional statement, and a unanimous contradiction counted as a delusional statement. Any outcome that was not unanimous was not counted in either category. We divided the number of delusional and nondelusional statements by the number of minutes in the session to calculate the rate for each type of response.

Functional analysis. A direct-care staff member who had never worked with Mr. Jones served as therapist. There were four 12-min sessions every other day for 1 week. The experimenters randomly alternated the attention, alone, demand, and control conditions in a multielement assessment design (see Wilder & Wong, 2007, for a review). In the alone condition, Mr. Jones was alone in the observation room with no planned reinforcement for delusional statements. In the attention condition, the experimenter responded to Mr. Jones's delusional statements with 10 s of attention in the form of disapproving comments (e.g., "That's not an appropriate topic right now"). In the demand condition, the therapist presented Mr. Jones with the vocational task of gathering combs, counting them, and placing them in plastic bags. Mr. Jones received 10 s of escape from task demands contingent on the emission of delusional statements. During the control condition, the therapist gave Mr. Jones access to favored reading materials, noncontingent attention every 30 s, and no consequences for nondelusional or delusional statements.

Experimental Design and Procedure

An ABAB design was used, in which A was baseline and B was differential reinforcement of nondelusional statements and extinction of delusional statements.

Baseline. Baseline replicated the attention condition of the functional analysis in which the experimenter provided 10 s of attention contingent upon delusional statements and ignored contextually appropriate nondelusional statements for 10 s.

Differential reinforcement of alternative behavior (DRA) and extinction. Each contextually appropriate, nondelusional statement was followed by 10 s of responses to Mr. Jones's statements or by the experimenter asking him questions. If he made a nondelusional statement about his work, the experimenter told him that it sounded nice and asked him to elaborate on what he did there and how he liked it. The experimenter withheld attention for 10 s if Mr. Jones made a delusional statement.

Follow-up sessions. Observers collected data at 6 months, 1, 2, and 4 years posttreatment to

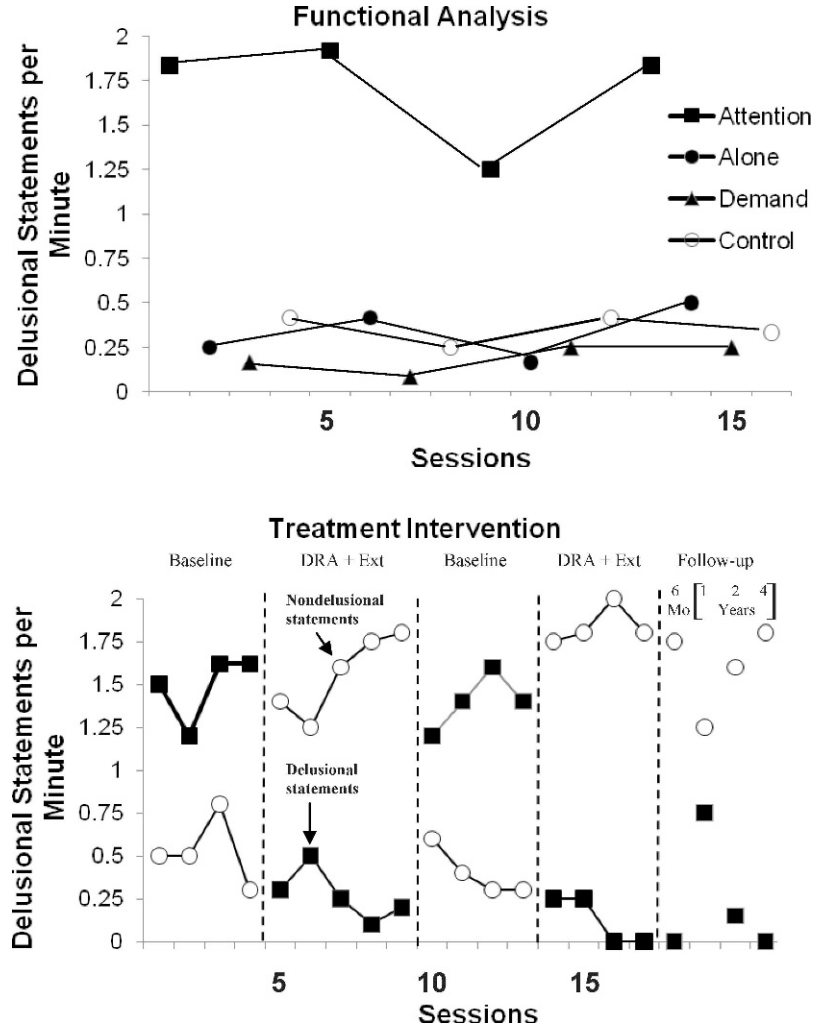

Figure 1. The number of delusional statements per minute during functional analysis sessions (top). Delusional statements per minute during the DRA and extinction sessions (bottom). Nondelusional and delusional statements are indicated by open circles and filled squares, respectively.

assess the long-term effects of the intervention at reducing delusional statements. These single observation sessions lasted for 12 min each. The randomly selected observation times were 8:30 a.m. for the 6-month follow-up, 9:30 a.m. for the 1-year follow-up, 5:30 p.m. for the 2-year follow-up, and 2:00 p.m. for the 4-year follow-up.

Interobserver Agreement

Two observers counted the number of nondelusional and delusional statements during 90% of the sessions (16 functional analysis and 17 treatment sessions). The experimenter calculated interobserver agreement by dividing the smaller number of delusional statements by the larger number and converting this ratio to a percentage. Agreement for both nondelusional and delusional statements was 100%.

RESULTS AND DISCUSSION

The functional analysis indicated that the delusional statements were maintained by attention (Figure 1, top). The mean rate of

delusional statements in the attention condition was 1.74 statements per minute (range, 1.25 to 1.95 in the attention condition and 0.10 to 0.44 in all other conditions), indicating that attention maintained delusional statements.

Figure 1 (bottom) shows the results of the intervention. During the initial baseline, the mean rate of delusional statements was 1.5 (range, 1.2 to 1.6). The mean rate of nondelusional statements was 0.53 (range, 0.33 to 0.8). During the first DRA and extinction phase, the mean rate of delusional statements was 0.27 (range, 0.08 to 0.5), and the mean rate of nondelusional statements was 1.56 (range, 1.25 to 1.75). When the contingencies were reversed in the return to baseline, the mean rate of nondelusional statements dropped to 0.42 (range, 0.33 to 0.6). The mean rate of delusional statements increased to 1.41 (range, 1.2 to 1.6). During the second DRA and extinction phase, the mean rate of delusional statements was 0.13 (range, 0 to 0.25), and the mean rate of nondelusional statements was 1.84 (range, 1.75 to 2).

The rates of delusional statements were 0, 0.8, 0.12, and 0 at 6-month, 1-, 2-, and 4-year follow-ups. The rate of nondelusional statements was 1.75, 1.20, 1.60 and 1.80 at 6 months, 1-, 2-, and 4-year follow-up. Thus, DRA and extinction effectively decreased delusional statements and increased nondelusional statements over a 4-year period.

During the four follow-up sessions, the rate of nondelusional statements ranged from 1.2 to 1.8, whereas that of delusional statements ranged from 0 to 0.8. At 6-month follow-up, the effects of this intervention were maintained; however, at 1-year follow-up, Mr. Jones showed an increase in delusional statements correlated with the presence of new staff members. Subsequently, the experimenters gave new staff a single training session on how to implement the DRA and extinction intervention, and Mr. Jones's delusional statements subsequently decreased to levels seen during the initial DRA and extinction intervention. The data at 2- and 4-year follow-ups demonstrated that continued staff training in the DRA and extinction intervention was critical to maintaining the initial treatment effects over the course of 4 years.

The immediate success of this intervention is consistent with earlier findings (Carr & Britton, 1999; Dixon et al., 2001; Durand & Crimmins, 1987; Rehfeldt & Chambers, 2003) and demonstrates the utility of functional analysis and treatment for an individual with intellectual disabilities, traumatic brain injury, and frontal lobe syndrome. In addition, the success of this intervention over the 4-year follow-up period extends the duration of these effects.

One limitation of the study was absence of data collection on treatment integrity during follow-up sessions. Thus, we cannot conclude that the reduction in delusional speech was the direct result of correct implemention of the treatment. Future research on the accuracy of staff implementation over the long term is needed to draw conclusions as to causal or maintenance variables. Future research on delusional verbal behavior also should focus on the role of the content of experimenter attention in maintaining delusional statements (DeLeon, Arnold, Rodriguez-Catter, & Uy, 2003).

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