

*REDUCING DELUSIONAL SPEECH IN CHRONIC,
PARANOID SCHIZOPHRENICS¹*

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Four schizophrenic patients with paranoid and grandiose delusions who had been hospitalized for an average of 17 yr were exposed to social reinforcement contingencies in a multiple baseline design. During the baseline period, each patient was interviewed for four 10-min sessions each day. The elapsed time from onset of conversation to onset of delusional talk was recorded. At the end of each day, the patients engaged in a 30-min informal chat with a nurse-therapist while relaxing with coffee, snacks, and cigarettes. The intervention introduced two contingencies: (1) The 10-min interviews were terminated as soon as the patient began talking delusionally; (2) The patients earned time for their evening chat by talking rationally during their daytime interviews. Increases of from 200 to 600% in the amount of rational talk exhibited during the interviews occurred as the contingencies were introduced for each patient sequentially over time. These increases were maintained in three patients when the amount of reinforcement was halved, but declined when the patients were confronted directly with their delusional ideas. A modest amount of generalization occurred from the day-time interviews to the evening chats but did not extend to the behavior of the patients on the ward.

The delusional speech of paranoid schizophrenic patients represents a response class of much clinical significance, but it has been studied little by behavior modifiers. Epidemiological studies indicate that the most frequent abnormal behavior leading to re-admission of previously hospitalized schizophrenics is verbalization of delusional and bizarre ideas (Hoenig and Hamilton, 1966; Wing, Monck, Brown, and Carstairs, 1964). While there is widespread belief that reinforcement contingencies control the content of psychotic speech, this conclusion is based primarily on uncontrolled reports (Kennedy, 1964; Rickard and Dinoff, 1962; Rickard, Digman, and Horner, 1960; Schaefer

and Martin, 1969). Only two studies have utilized control procedures in the measurement and modification of delusional speech.

In a now classic study, Ayllon and Haughton (1964) reported the effectiveness of contingent attention, approval, and tangible reinforcers on increasing and then decreasing grandiose delusions in a single patient. This was paralleled by a decrease followed by an increase in neutral talk when the respective contingencies were focused on the rational speech. Ayllon and Haughton reported no reliability data for their 21 nurses who carried out the observations and interventions. The number of trials per day and the use of instructions were not kept constant as the nurses evidently interacted with the patients in a casual, informal manner.

Wincze, Leitenberg, and Agras (1972) presented well-controlled data on 10 paranoid schizophrenic patients. They found that instructions were effective with only four patients while token reinforcement reduced the observed percentage of delusional verbal behavior in seven patients. Generalization did not occur from therapy sessions to the behavior of the patients

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on the ward, the latter assessed on a time-sampling basis.

The present study was devised to elaborate on the previous work done with delusional speech. Social contingencies were used to facilitate generalization. Rational speech was the response class reinforced in a multiple baseline design.

METHOD

The Experimental Ward

The research was carried out at the Clinical Research Unit, a 12-bed co-ed ward at Camarillo State Hospital. The nursing staff² is composed of 14 nurses and psychiatric technicians trained in behavioral analysis and modification. Their observations and interventions with the patients are supervised and supplemented by a research assistant, social worker, psychologist, and psychiatrist who are behaviorally trained.

Subjects

The two men and two women participating in the study were all diagnosed many times as chronic paranoid schizophrenics and had been hospitalized for an average of 17 yr. They were transferred to the Clinical Research Unit from different wards around the hospital and spent three weeks adapting to the Unit before the Baseline phase began.

Jane V. Jane was a 45-yr-old black woman who had been married twice and had a history of multiple hospital admissions. Her most recent admission was prompted by daily episodes of screaming and cursing at the Welfare Department office where she regularly demanded additional allotments of money. Her appearance was often bizarre with cloth wound around her legs and an exaggerated application of cosmetics. She had both persecutory and grandiose delusions, including accusing staff of stealing her clothes, poisoning her food, and injecting her

with "monkey blood" which turned her from white to black. She also insisted that she was not a patient but rather was wealthy, owning her own home, orchards, real estate, and diplomas from colleges.

Herman N. This 38-yr-old, black veteran had 3 yr of college before entering the Army when he was first diagnosed psychotic. He had spent the bulk of the preceding 16 yr in psychiatric units of VA hospitals. His delusional topics included assertions that he was an agent of the FBI, "international police", James Bond, CIA, and a five-star decorated general who had fought in five wars. He claimed to be a member of various fraternal groups, a religious leader, and a college graduate about to assume a teaching position in a Southern college.

Jack E. A 64-yr-old scion of a wealthy family, Jack had been continuously hospitalized for 18 years. He spent many hours cutting out articles from newspapers and magazines that he claimed supported his delusions. Jack's delusions included beliefs in supernatural events (e.g., laser beams from the moon) focused by some unknown being upon his destruction. He averred that plastic look-alikes were impersonating his family members, and that he had been swindled out of billions of dollars.

Mary N. This 60-yr-old unmarried white woman had been continuously hospitalized for 25 yr. Mary's delusional speech centered on her identity and family background, including a belief that she was 18 yr old, born of nobility in Algeria, and tutored in Switzerland. She insisted that her name was Sandy F. and that she had a wealthy husband who was coming to bring her home.

Experimental Procedures and Response Measures

During the first three weeks after the patients were transferred to the Clinical Research Unit, the nursing staff held frequent conversations with the patients and evoked topics of rational and delusional speech. Lists were made

²Throughout this article, the terms nurse, technician, therapist, and nursing staff are used interchangeably.

of the verbal repertoires of the patients' delusions and these were checked with case histories, and interviews with families and other hospital staff who knew the patients. From these lists, all questionable delusions were eliminated. The lists of delusional statements and topics were distributed to each therapist for reference during the experiment.

Three sources generated response measures for the study.

1. *Daily interviews.* Four times a day, each patient was interviewed by a member of the nursing staff for 10 min. The nurses rotated responsibility for patients so that special relationships were not developed. The interviews took place in various places around the ward and were scheduled so that two occurred between 7:30 a.m. and 3:30 p.m., one between 3:30 p.m. and 7:30 p.m., and one before 7:30 a.m.

A glossary of topics and questions to prompt conversation during the 10-min interviews was provided to each nurse-therapist. The glossary included circumstances involving hospitalization, feelings about hospitalization, attitudes toward Unit and staff, family relationships, finances, previous education, and current activities. The nurses were instructed to use the glossary as a guideline and to rotate through the topics sequentially to control for the possibility that some topics would evoke delusional speech more than others. As soon as the patient began speaking in reply to the first question, the nurse began timing using a stopwatch. The watch was stopped at the onset of delusional speech. The timing was done surreptitiously. The response measure was duration of rational conversation to the onset of delusional speech.

The nurses were trained to use prompts and acknowledgements to foster the flow of conversation. When the patient was talking, the nurse was instructed to acknowledge the talk approximately every 15 sec with "mmm-hmmm", a head nod, or such phrases as "tell me more", "that's interesting", "oh!", "do you have anything else to say about that?", or "sounds

good". If the patient became silent for 30 sec, failed to respond to a prompt, or refused to continue on the subject, the nurse prompted the patient with another question or topic from the glossary.

2. *Evening chats.* After 7:30 p.m., each patient was involved in a 30-min chat and snacks with a therapist. The therapist holding the evening chat was kept constant as much as possible and the matching of therapist with patient was made on the basis of mutual liking. This chat was held in the staff dining room or some other comfortable and private place. Coffee, fruit, donuts, cookies, and other goodies were served to enhance the reinforcing properties of the occasion. The patient was told that anything could be talked about. Generalization measures were taken during the evening chat by nursing staff using a stopwatch surreptitiously to record the amount of time spent talking rationally, delusionally, and in silence on successive days. During the evening chat, the topics of conversation could be introduced by the patient or the therapist. The therapists were instructed to permit expressions of delusions and to give verbal acknowledgement of the expression without agreeing to its specific content. For example, if a patient said: "The food here is being poisoned", the therapist's response would be: "Oh!" or "You don't say", rather than a direct agreement. If the patient asked for compliance or agreement from the therapist, the latter was instructed to answer honestly with a disagreement, but with no argument. When silences or refusal to continue on a topic occurred, the nurses were instructed to choose another topic that tended to evoke rational talk.

3. *Speech on the ward.* The nurses kept count of the number of times patients expressed delusional material to them during each 24-hr period outside of the interviews and chats. Each conversational interchange, no matter how brief or long, that contained any mention of a delusional topic was considered a single unit. No other therapy was given to the patients during this study.

Reliability Procedures

Inter-rater reliability measurements were taken during the daily interviews and evening chats. Each therapist was compared with the other therapists for at least seven of the daily interviews and for each of the three targeted responses during the evening chats. There were 13 to 24 reliability sessions for each patient. The therapists sat out of view of each other during the reliability sessions and used silent stopwatches for their measurement of duration of the targeted response class. Agreement between raters was arbitrarily defined if both durations were within 5 sec of each other. Reliability was calculated by dividing the number of sessions in which ratings agreed by the total number of sessions on each patient for the daily interviews and evening chats separately.

Experimental Design

A multiple baseline design was used with each patient's daily duration of rational talk to onset of delusional expression serving as a separate baseline. During the baseline condition, each patient completed the full 10-min interview four times daily regardless of onset of delusional speech. During this period, the evening chat and snacks were provided non-contingently for the full 30 min.

After a varying period of time for the baseline conditions, each patient entered Treatment Phase A. Two contingencies were introduced:

- a. The 10-min interview was terminated at the onset of delusional speech.
- b. The amount of time for the evening chat and snacks was made directly proportional on a one-to-one ratio to the number of minutes of rational talk accumulated during the four daily interviews.

The patients were instructed on the contingencies on the day they went into effect. The nurses were instructed to note occurrences of delusional speech at all times on the ward but not

to acknowledge these incidents with verbal feedback.

Treatment Phase B was designed as a reinforcement fading procedure, and lasted 18 days for all patients except Herman, who continued for 38 days. The evening chat and snacks were offered every two nights and the number of minutes of rational talk accumulated over a two-day period (total possible = 80 min) was divided by two in determining the length of the evening chat. Since there were reports by the patients and therapists alike that the 10-min interviews were becoming boring, they were cut to 5 min and eight per day were held (one before 7:30 a.m.; four between 8:00 a.m. and 3:00 p.m.; three between 3:00 and 7:30 p.m.).

Treatment Phase C, lasting 45 days, was instituted for Jack E. and Mary N. using identical procedures for these two patients. Because Jack and Mary reached a high level of rational talk during Phases A and B (averaging 75% of their maximum possible score), it was decided to challenge them with questions that were more likely to evoke delusional responses. Thus, during every other 5-min interview the therapists were instructed to bring up for conversation "sensitive" topics for these two patients. The delusional topics were again listed for the therapists as a guideline for use during interviews.

RESULTS

Reliability

The inter-rater agreement on the onset of delusional talk during the daily interviews varied between 0.75 to 0.93 (mean for 73 reliability trials was 0.82) for the various patients. The criterion for agreement was ± 5 sec. During the evening chats, inter-rater reliability ranged between 79 and 96% on silences (mean = 87%, $N = 4$); 86 to 98% on delusional speech (mean = 94%, $N = 4$); and 84 to 96% on rational speech (mean = 89%, $N = 4$). A five-day sampling of the actual rotation of conversational topics from the glossary indicated that the therapists varied in their use of topics by

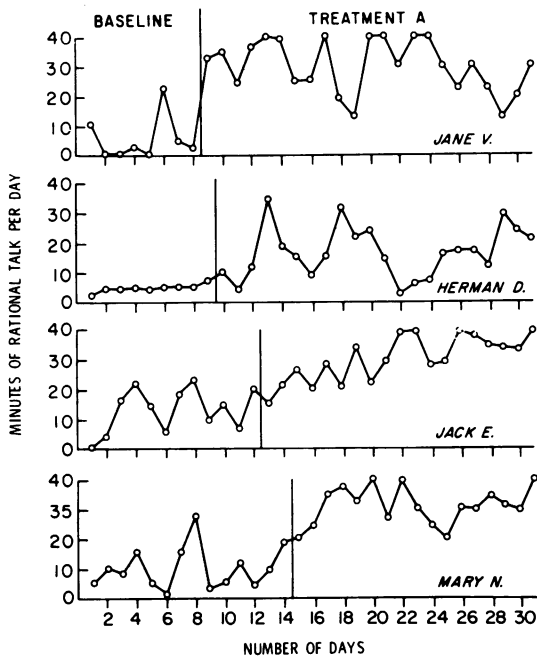


Fig. 1. Duration of rational speech before onset of delusions in four, 10-min interviews under baseline and contingent social reinforcement (Treatment A) conditions.

no more than 10% between the most often and least often used topics.

Rational Speech on a Multiple Baseline

The duration of rational speech under baseline conditions showed much individual variation but each patient had a reasonably stable range. Figure 1 shows the effects on the multiple baseline of introducing the contingencies of Treatment Phase A in a temporal sequence for each patient. Withdrawal of attention for delusional speech and making the duration of the evening chat and snacks contingent upon the amount of rational talk during the day produced on the average a 200% increase in Jack, a 300% increase in Mary and Herman, and a 600% increase in Jane. These differences between the Baseline and Phase A are statistically significant at beyond the 0.05 level (Rn Test, Revusky, 1967).

The patients quickly responded to the contingencies, with the most dramatic and rapid response being made by Jane, who verbalized the

contingencies several times during the first day. Anecdotal reports of the rational speech of the patients revealed a wide variety of topics including hobbies, facts from pre-hospitalization life, current events, and attitudes toward other patients and staff on the Unit.

Rational Speech during Thinning of Social Reinforcement

During Treatment Phase B, when the amount of reinforcement was halved, three of the four patients maintained their levels of rational speech. Figure 2 presents the means and standard deviations of rational speech during the daily interviews for Phase B. Jane's level, however, dropped by one-third.

Rational Speech during Confrontation with Delusional Topics

During Treatment Phase C for Mary and Jack, every other interview focused on sensitive topics that were more likely to evoke their delusions. Their duration of rational talk to onset of delusional speech declined during this phase, more markedly for Mary than for Jack. The data are graphed in Figure 2. Both patients were still talking rationally longer during this phase than during the baseline, non-contingent conditions.

Generalization Data

The generalization data from the evening chats are presented for each patient in Figure 3. When increases and decreases in rational and delusional speech respectively were arbitrarily defined as changes of 50% or more from baseline during one or more of the treatment phases, three of the four patients showed decreases in delusional speech and two of four showed increases in rational speech and silences. It should be noted that the patients always consumed their snacks during the evening chats.

The actual duration of the evening chats did not significantly differ across experimental phases for Jack and Mary, ranging on the average between 25.8 and 33.4 min. Jane's evening chats

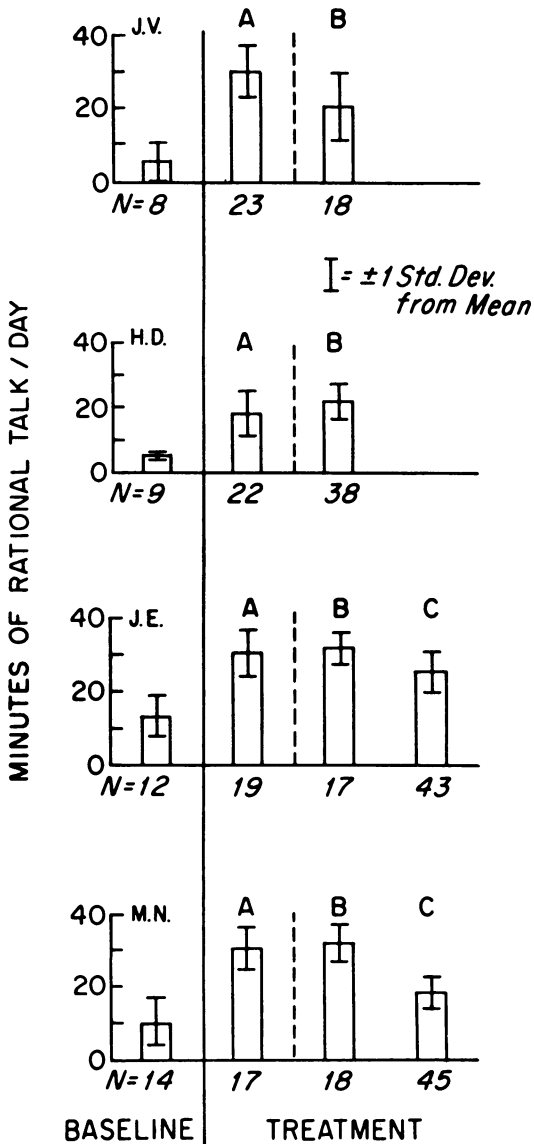


Fig. 2. Mean duration of rational speech during daily interviews. Treatments A and B are contingent social reinforcement (provided daily and every other day respectively). Treatment C adds topics designed to evoke delusional speech during every other interview.

decreased from an average of 30 min during Baseline and Treatment A to 21.5 min during Treatment B. Herman's chat duration averaged 31.6 min during Baseline and decreased to 17.2 to 23.0 min during Treatments A and B. Herman was the only patient who showed no generalization effects in the evening chats.

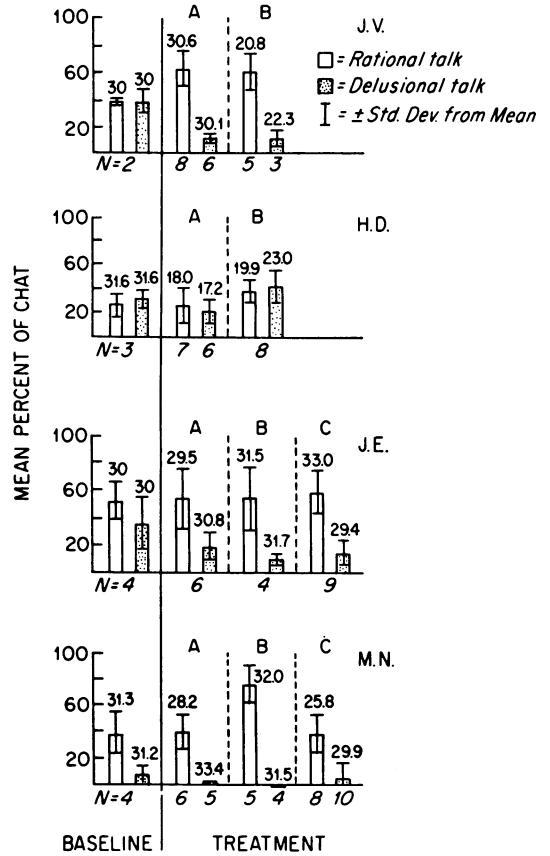


Fig. 3. Mean per cent of rational and delusional speech during generalization sessions. Treatments A and B are contingent social reinforcement provided daily and every other day respectively. Treatment C adds topics designed to evoke delusional speech during every other interview. Numbers above bars are mean durations of generalization sessions, in minutes.

Jane showed similar frequencies in delusional remarks to staff in casual and routine interaction, averaging 2.5 per day during Baseline and Treatment Phases A and B. Herman averaged 4.5 delusional remarks per day rather consistently throughout the study, except for a four-day period during Treatment Phase B when he was in a hostile battle with staff members. An illicit supply of tobacco was discovered in his room and he was forced to surrender it to the Unit canteen, requiring him to buy it back with tokens. During this four-day period, his delusional remarks increased to 17 to 40 per day. Jack averaged 1.4 delusional statements per day until Treatment Phase C when his frequency

increased to an average of 4.2 per day. Mary rarely expressed delusional material to staff, only five such remarks being recorded throughout the study.

DISCUSSION

Using a multiple baseline design, it was found that the rational speech of four paranoid schizophrenics during daily interviews reliably and markedly increased as a function of the introduction of a treatment containing extinction and reinforcement procedures. The procedures consisted of: (a) termination of the interview at onset of delusional speech and (b) an informal evening chat and snacks given in direct proportion to the amount of rational talk accumulated during the interviews. This substantiates the findings reported by Ayllon and Haughton (1964) on a single case using social reinforcement and lends additional evidence to the token reinforcement study by Wincze, *et al.*, (1972) that current environmental contingencies can effectively modify long-standing delusional behavior in psychotics.

While the introduction of reinforcement contingencies clearly modified important symptomatic behavior in the four psychotic patients, there is evidence that the treatment reduced delusional speech temporarily and incompletely. This finding is consistent with the incomplete suppression of delusional speech reported by Ayllon and Haughton (1964) and Wincze, *et al.*, (1972). Increasing one response class thought to be incompatible with a second does not necessarily produce cessation of the second. In the current study, the social contingencies used were not effective in completely suppressing delusional speech, even though 200 to 600% increases in rational talk occurred.

Some generalization occurred in the patients' expression of rational ideas. Three of the four patients showed decreases of 50% or more in amount of delusional speech in the evening chats during treatment as compared to baseline conditions. Two of four patients exhibited

similar magnitudes of increases in rational speech during the evening chats. This is somewhat surprising because the patients knew from repeated instructions and from testing the contingencies that they could talk about anything they wanted during the chats. The modest amount of generalization recorded is greater than that reported by Wincze, *et al.*, (1972) and approximately the same as that reported by Barton (1970) in her study of appropriate verbal responses to pictures by a retardate. [In both the Barton study and the present one, social reinforcement was provided versus token reinforcement in the Wincze, *et al.*, study.] Social reinforcement may possibly facilitate generalization because it is the relevant reinforcer in the settings where generalization is tested.

No generalization of treatment effects could be detected in the routine interchanges that occurred between patients and staff throughout the day outside of the interview sessions and evening chats. The frequencies of delusional remarks remained stable between baseline and Treatment Phase A and increased in Jack during the last treatment phase. The similarity in stimulus settings between the interview sessions and the evening chat was much greater than between interviews and routine ward interchanges, which may have accounted for the differences in generalization found in the two settings.

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