*REWARDING PSYCHIATRIC AIDES FOR THE BEHAVIORAL
IMPROVEMENT OF ASSIGNED PATIENTS¹*

OVIDE F. POMERLEAU, PHILIP H. BOBROVE, AND RITA H. SMITH

UNIVERSITY OF PENNSYLVANIA, JEFFERSON MEDICAL SCHOOL, AND
UNIVERSITY OF PENNSYLVANIA

Different ways of modifying the aide-patient relationship to promote improvement in psychiatric patients were investigated. Psychiatric aides were given information about the behavior of assigned patients, cash awards based on the improvement of assigned patients, and different kinds of supervision by the psychology staff; the effects of these variables on a large number of psychiatrically relevant behaviors were measured. Appropriate behavior of patients increased when the aides were given quantitative information about the improvement of assigned patients. Cash awards for aides, which were not contingent on the behavior of patients had little effect, while cash awards contingent on the behavior of assigned patients were associated with more appropriate behavior. Direct supervision of aide-patient interactions was associated with an increase in appropriate behavior, while required consultation for the aides about assigned patients was not. Behavior of patients deteriorated when the program was terminated.

Until the development of the token economy by Ayllon and Azrin (1965, 1968), most operant conditioning applications in the psychiatric ward were characterized by dependence on the measurement of a single response, the use of a single reinforcing stimulus, and implementation of the reinforcement schedule by a trained psychologist working with one patient at a time (Ayllon and Azrin, 1965). The token economy has greatly extended the power of reinforcement techniques by providing a controlled social environment with multiple reinforcers (secondary reinforcers and a number of primary reinforcers) for many people at one time, typically administered (on a day-to-day basis) by subdoctoral personnel (Ayllon and Azrin, 1968; Schaefer and Martin, 1969).

A promising line of growth for the token economy concept is the shift from an emphasis on self-care and participation in ward activities to an emphasis on modifying behaviors more closely associated with psychosis (Schaefer and Martin, 1966). This shift is supplemented by new trends in the experimental analysis of psychotic behavior, which take into account the interactions and potential social reinforcers provided by the various individuals who comprise a treat-

ment environment (Ayllon and Michael, 1959; Saslow, 1968); in keeping with this line of inquiry are recent investigations on the use of psychiatric patients as therapists for other patients (Kale, Zlutnick, and Hopkins, 1970; Pomerleau, Bobrove, and Harris, 1972) and on increasing the number of structured interactions between therapists and patients through the use of behavioral contingencies (Panyan, Boozer, and Morris, 1970).

The present study was designed to explore some of the variables that affect the behavior of psychotics, using the psychiatric ward as the experimental space. Among the many environmental variables that impinge on the psychiatric patient, interaction with aides seems to be

¹The authors acknowledge with gratitude the assistance of Cynthia Pomerleau, David Williams, Edward Mannering, Rosemary Boehringer, Judith Siverson, and Deborah Fernhof; additionally, Louis C. Harris gave the project much-needed support and encouragement as clinical director of the Temple University Unit. Portions of the program described herein were supported by the National Institute of Mental Health under Grant MH 18374. Reprints may be obtained from Ovide F. Pomerleau, Department of Psychiatry, 1148 Gates Bld., Hospital of University of Pennsylvania, Philadelphia, Pennsylvania 19140.

crucial: psychiatric aides frequently have the most extensive relationship with patients; in numbers alone aides have a tremendous potential as agents for behavioral change; and finally, aides have received minimal training and encouragement for therapy in the past and have contributed to the all-too-familiar custodial environment. For this reason, the experiment investigated ways of modifying aide-patient interactions to produce greater improvement in patients.

The present approach differed from the typical behavior modification procedure in that the subject, the psychiatric aide, received rewards based on the behavioral improvement of his assigned patients (indirect contingency) rather than on measured changes in his own behavior (direct contingency). Additionally, the procedure is in contrast with the usual one for operant conditioning in which a single, arbitrarily chosen response is modified. In the present setting, the maladaptive behaviors exhibited by the patients were quite diverse (ranging from extreme apathy to highly disruptive agitation); since no single behavior could be selected as representative of the patients' clinical status, a retrospective questionnaire, which sampled a large number of psychiatrically relevant behaviors, was employed. This questionnaire, the Ward Behavior Inventory (Burdock and Hardesty, 1968), consists of 138 binary questions and was the principal dependent variable of the study.

METHOD

Subjects and Setting

The primary subjects of the research project were 12 psychiatric aides; in any given month of the 11-month study, nine aides were present. Aides earned approximately \$5500 per annum, were state civil service employees, and varied in age from 24 to 44 yr (median age, 29 yr) and in education from grammar school to college graduate (median, 12 yr of schooling).

The rest of the staff consisted of five predoctoral psychology interns (two present in a given condition), two psychologists (the first

and second authors), one psychiatrist (who served as Temple University Unit director and physician for the first nine months of the project), a psychiatric technician, a nurse, and a social worker.

During the course of the study, there were 65 psychiatric in-patients (at any one time approximately 25 men and women, ranging in age from 16 to 68 yr, with a median of 42 yr) who were treated in the behavioral program of the Temple University Unit at Philadelphia State Hospital. Patients were admitted on the basis of having been intractable or unmanageable in the Temple University Community Mental Health Center emergency ward and also in the admissions ward of the Temple University Unit; most of the patients were physically active and many had had several previous psychiatric hospitalizations. The patients in the behavioral program made up that 20% of those admitted who could not be discharged after standard psychiatric treatment for a month in the admissions ward and who did not have severe physical debility or demonstrable organic pathology. Transfer from the admissions ward to the behavioral ward was made without consulting the staff of the behavioral program.

The behavioral program consisted of a token economy (Ayllon and Azrin, 1965) administered in a locked psychiatric ward. All residents of the ward were required to participate in the program; many of the patients received maintenance doses of psychotropic drugs (prescription not contingent on a particular psychotic episode). The basic economy had been modified (Pomerleau *et al.*, 1972) to emphasize social interaction among patients, and was specifically designed to prevent institution-produced apathy and to reduce the frequency of the behaviors that had resulted in psychiatric commitment.

Procedure

General procedure. Each of the psychiatric aides on the two daytime tours of duty was given exclusive responsibility for one or more patients (randomly assigned), and was freed of

custodial duties that were performed by the patients as part of the therapy program. The aides were encouraged to develop a therapeutic relationship with their patients and to carry out specific, pre-arranged reinforcement schedules for their patients (Ayllon and Michael, 1959; Schaefer and Martin, 1966) in addition to the general transactions of the token economy. As part of their duties, the aides were asked to consult with the psychology staff about the design and feasibility of various treatment programs for their patients.

The comportment of patients in the program was sampled twice a week using the Ward Behavior Inventory (Burdock, Hakerem, Hardesty, and Zubin, 1960; Burdock and Hardesty, 1968), a quantitative, standardized record of observations of appearance and bearing, verbal behavior, and adaptation to ward routine. All patients were rated on the basis of approximately 12 hr of observation on the ward; the psychiatric technician and nurse shared this duty, one serving as observer on Monday and the other on Tuesday. The mean of the two ratings was defined as the patient's score for that week. Every week of the 11-month research project, changes in the behavior of patients (improvement or deterioration) were calculated by subtracting the patient's Inventory score for the current week from his score for the previous week.

The index of performance for a given aide on a particular week was determined by obtaining the signed mean of the behavioral changes for the patients assigned to that aide. On Fridays, an "aide of the week" award (recognition or a cash incentive) was given to the aide on each of the two daytime tours of duty whose performance index showed the greatest improvement in assigned patients; another award, the "most cooperative aide" award, was given to the aide on either tour who had helped his fellow workers the most with their patients that week (selected by secret ballot). The treatment program and general procedure described were kept as close to constant as possible throughout the experimental period.

Training ward behavior observers. For four months before the start of the research project, Ward Behavior Inventory ratings were taken. Two of the psychology interns rated the patients in the program for two successive weeks to determine whether samples from the first two days of the week were representative of the behavior of patients for the entire week. The interns, the psychiatric technician, and the nurse then observed the patients together for 14 different days over the next two months, each observer rating the patients independently at the end of the day; correlations between the ratings of the several observers were then calculated to determine inter-observer reliability. The procedure also served to train the observers and to adapt the patients to having members of the staff continually present.

Experimental conditions. The study was divided into 11 four-week categories, or conditions. The three weeks before the first condition were used as a practice period; during that time, the psychiatric aides had patients assigned to them, the ward behavior observers rated patients on the Inventory, and changes in the behavior of patients and the index of aide performance were calculated. (The procedure was identical to that of control condition B₁.)

Table 1 shows the sequence and gives a brief description of the different conditions. The conditions shown in Table 1 can be grouped into three overlapping phases, each dealing with a different experimental question: the first phase (B₁ through B₂) investigates the effects of giving aides a non-contingent award and information about the behavior of patients; the second phase (conditions B₂ through 20₂) examines the effects of giving aides cash awards based on the behavior of patients; the third phase (conditions 20₂ through T) explores the effects of consultation and supervision by the psychology staff. The sequence of the first two phases was determined in advance of the experiment; the sequence of the third phase was prompted by the previous results, except that condition T was not planned at all.

Table 1

Description and sequence of experimental conditions.

<i>Condition</i>	<i>Description</i>
B ₁	Baseline—Improvement of assigned patients not announced
NC	Non-contingent award—\$20 award to "most cooperative aide" (not contingent on the behavior of assigned patients); improvement of assigned patients not announced
F	Feedback—Aides ranked on the basis of improvement of assigned patients
B ₂	Baseline—same as B ₁
10	\$10 award to "aides of the week"; aides ranked on the basis of improvement of assigned patients; \$20 award to "most cooperative aide"
20 ₁	\$20 award to "aides of the week"; aides ranked on the basis of improvement of assigned patients; \$20 award to "most cooperative aide"
30	\$30 award to "aides of the week"; aides ranked on the basis of improvement of assigned patients; \$20 award to "most cooperative aide"
20 ₂	Same as 20 ₁
C	Consultation—Aides required to consult about assigned patients with the second author; otherwise same as 20 ₁
S	Supervision—Aides required to consult about assigned patients with the second author; aide execution of reinforcement schedules supervised directly by the first author; otherwise same as 20 ₁
T	Termination—Behavioral program not in effect; aides no longer required to carry out reinforcement schedules or transactions of the token economy; therapy no longer supervised by psychology staff

Condition B₁ marked the official beginning of the research project. The aides were informed that the project was beginning and that cash awards based on the index of aide performance would be given in subsequent conditions. (No indication was given that the primary objective of the research was to observe changes in the behavior of all patients on the ward as a function of behavioral contingencies for the aides.) Aides voted for the "most cooperative aide" and

the results were announced, but no cash award was given; selections for "aides of the week" were not disclosed publicly. The second condition, condition NC, called for a \$20 award to be given to the "most cooperative aide". Condition NC tested the effects on the behavior of patients of giving a cash award that was not contingent on patient improvement. In condition F, the cash award to the "most cooperative aide" was discontinued, although the aides were told whom they had selected, and instead, the aides of both daytime tours of duty were provided with a list posted in the nurses' station (feedback) in which they were ranked within their tour on the basis of the index of performance (mean behavioral change in assigned patients). Condition B₂ was a return to the control procedure of B₁.

The second phase was designated the "aide incentive program". In these conditions, cash awards of varying amounts were given to the aides whose index of performance was highest on their tour. The \$20 award to the "most cooperative aide" and feedback on the improvement of patients were continued.

The third phase studied the effects of consultation and supervision. From the beginning of the research project, the aides had initiated consultation with the psychologists about assigned patients on an infrequent basis. In condition C, aides were required to confer individually every day with one of the psychologists (the second author); reinforcement schedules for assigned patients were designed in these conferences. The second author spent a mean of 43 min per day over a four-day week in consultation with the aides in this condition. In condition S, the first author began direct supervision of the aides' execution of reinforcement schedules, while the second author continued consulting with the aides. Aides were encouraged to interact with their patients and to modify problem behaviors; the first author served as a model for the aides who were present by carrying out a reinforcement schedule with a difficult patient at least once a day. In this condition, the

first author spent a mean of 3.3 hr per day supervising, while the second author spent a mean of 14 min per day consulting. Throughout conditions C and S, awards of \$20 were made to the "aides of the week" and to the "most cooperative aide", and feedback on the improvement of patients was given. In condition T, the aide staff was not required to carry out behavioral prescriptions or the transactions of the token economy; the psychologists no longer supervised the treatment program, this function becoming the responsibility of the physician who replaced the original clinical director. All awards and feedback were discontinued.

RESULTS

Reliability of the behavioral measure. For two successive weeks, the Inventory scores for Mondays and Tuesdays were compared with the scores for Wednesdays, Thursdays, and Fridays. The mean score for the first two days of the work week (21.30) was not significantly different from the mean score for the last three days of the week (20.62) on the Wilcoxon matched-pairs, signed-ranks test ($p = 0.52$, two-tailed, for an N of 10). The Inventory ratings by the two psychology interns, the psychiatric technician, and the nurse were highly correlated. For the last day in which they observed together, the six pairing combinations for the four raters produced Spearman rank correlation coefficients (r_s) from $+0.71$ to $+0.92$ (each significant at the 0.01 level, one-tailed; Table P, Siegel, 1956).

Effects of the experimental manipulations. The behavioral scores for all patients present for one week or more of a given condition are shown in Figure 1. Low scores are associated with appropriate behavior and high scores with inappropriate behavior. Figure 1 indicates the overall functioning of the patients on the ward over the course of the experiment. As can be seen, patients behaved more appropriately in the feedback condition than in the two previous conditions; also, as the cash awards to the aides were increased, up to \$30, behavior on the ward

became more appropriate. The patients behaved less appropriately when the award to the aides was decreased in the second \$20 condition and somewhat more appropriately in the supervision condition than in the consultation condition. The termination condition was associated with a sharp decrease in appropriate behavior.

DISCUSSION

The Ward Behavior Inventory was found to be a reliable, readily accepted instrument for recording changes in the behavioral adjustment of patients. The correlations among the several Inventory raters were very high; changes in Inventory scores, indicating an increase or a decrease in appropriate behavior, were in agreement with the professional staff's evaluation of the clinical status of the patient. Statistical comparison of the first two days of the work week with the next three suggested that the two-day sample of the behavior of patients at the beginning of the week was representative of their behavior for the remainder of the week.

Figure 1 provides an overview of behavior on the psychiatric ward. As an indicator, it is similar to the measure of littering—per cent litter returned by the audience—used by Burgess, Clark, and Hendee (1971). The conditions shown in Figure 1 can be examined most conveniently in phases, each phase dealing with a different experimental question.

First phase. An award for cooperation among aides was incorporated into the design to meet objections that competing for money would disrupt aide relationships. The award was not contingent on the improvement of patients and, as shown in Figure 1, produced little change in the behavior of patients. This finding is consistent with results reported by Ayllon and Azrin (1965). The award for cooperation had some effect on the behavior of the aides, however, as evidenced by the initial refusal of the aides to vote for "most cooperative aide" when the stipend was terminated. In the next condition, providing the aides with knowledge of

Fig. 1. The mean Ward Behavior Inventory score for all patients as a function of experimental condition; the number of patients in the program is shown for each condition.

results (feedback) about their patients was associated with an increase in appropriate behavior. When feedback was no longer given, the patients behaved less appropriately. This finding for an indirect contingency is consistent with reports on the effects of feedback on performance (Wolfe, 1951; Leitenberg, Agras, Thompson, and Wright, 1968; Panyan, Boozer, and Morris, 1970; Lindsley, 1971a, 1971b).

Second phase. The patients as a group behaved more appropriately when the cash award to the aides was increased and less appropriately when the award was decreased. Changes in the verbal behavior of the aides were consonant with these results. For example, the transition

from the \$10 award to the first \$20 award was noteworthy because for the first time the aides asked about the details of the award decision. (Before the first \$20 award condition, attempts to impart technical information to the aides had been largely unsuccessful.) The aides now requested and received copies of the Ward Behavior Inventory and were shown how the scores for assigned patients were converted into an index of aide performance. It seems unlikely, judging from previous behavior, that the aides would have requested information had cash awards not been given. Moreover, the transition from the \$30 award to the second \$20 award condition (associated with a deterioration in the

behavior of patients) was marked by complaints from the aide staff and by threats of doing less work. The effects of the cash awards on the verbal behavior of the aides and on the behavior of the patients as shown in Figure 1 are in keeping with the findings for direct contingencies of reinforcement reported by Ayllon and Azrin (1965).

Third phase. Complete specification of the independent variables in the last phase of the experiment is difficult; however, the results support the thesis that changing the work environment of the psychiatric aide has an effect on the behavior of the psychiatric patient. The results of the conditions in which the aides were required to consult with the second author or were supervised by the first author while carrying out reinforcement schedules suggest the superiority of direct supervision over consultation alone. The amount of time spent in consultation was less than in supervision and may, in part, account for the different effects of the two conditions; however, the time spent in consultation with the psychologist was about as much as the aides would tolerate, whereas the time spent by the supervising psychologist could have been extended. The termination of supervision by the two psychologists (made necessary by changes in ward policy beyond their control) was marked by a considerable decrease in appropriate behavior. Analysis of this condition is complicated by the fact that even though they were no longer required to carry out the behavioral program, the aides decided among themselves to continue the transactions of the token economy and to resist pressure from the new clinical director to resume custodial duties.

The present results suggest, though they do not prove, that feedback, cash awards, or supervision for aides increases the amount of appropriate behavior in patients. Some of the characteristics of the present setting made a rigorous experimental design difficult to carry out and should be taken into account by those planning similar investigations. In particular, the in-

fluence of the psychiatric aides on the experimental design deserves mention. After the cash incentive conditions were put into effect, several aides began to hint that cessation of awards for research purposes might be met by a refusal to work. The original procedure called for the presentation of cash awards in increasing amounts (giving the aides time to acquire appropriate skills before competing for larger awards), followed by several conditions in which no award or a \$20 award was to be given. The deterioration in the behavior of patients and in the morale of the aides when the cash award was decreased from \$30 to \$20, however, suggested that termination of awards might produce a major disruption of service to the patients. For this reason, in the third phase cash awards were continued at the same level and a new independent variable, supervision, was introduced.

Without the award *versus* no-award comparisons, it was not possible to demonstrate statistically that incentives for aides increased the amount of appropriate behavior in patients. On the one hand, the number of patients entering the program during a given condition was small (four on the average), so it was not feasible to compare the behavior of different patients in the several conditions using a group design. On the other hand, while comparing the behavior of the same patients in adjacent conditions using a longitudinal design was possible, the approach created a new problem: since the patients stayed a median of 10 weeks in the program, the patients who were available for comparison in juxtaposed conditions were the ones who were less responsive to the treatment, thus biasing the analysis against showing significant differences; also, few patients stayed long enough in the program to allow statistical comparisons between non-juxtaposed conditions. Assuming support from the aides and resources to maintain parallel programs, it would probably be preferable from the point of view of design to maintain patients in an experimental program long enough to be evaluated in both

a treatment condition and a control condition; patients could complete the experimental program after a fixed time period and then transfer to another ward for further treatment or go home, depending on how much they improved.

The authors hope that the present study will stimulate further research on the delivery of service in psychiatric settings. The effects of knowledge of results, monetary incentives, and supervision for the aides on the behavior of the patients remains to be determined precisely. The conditions that make money an effective reward for aides and a search for reinforcers other than money are also promising lines of inquiry. Finally, other ways of specifying award contingencies might be worth exploring; for example, aides could receive awards based on exceeding a given standard of appropriate behavior in patients instead of competing against other aides, the amount of appropriate behavior required for the award increasing gradually in a shaping procedure.

In conclusion, the present study demonstrates that the behavior of the psychiatric patient is affected by variables that impinge on the psychiatric aide. A major implication is that helping behavior can be enhanced by the scheduling of extrinsic reinforcers; possibly the approach can be extended to other settings where work is performed without a clear knowledge of results or in which there is little tangible reward for excellence.

REFERENCES

- Ayllon, T. and Azrin, N. H. The measurement and reinforcement of behavior of psychotics. *Journal of the Experimental Analysis of Behavior*, 1965, 8, 357-383.
- Ayllon, T. and Azrin, N. H. *The token economy*. New York: Appleton-Century-Crofts, 1968.
- Ayllon, T. and Michael, J. The psychiatric nurse as a behavioral engineer. *Journal of the Experimental Analysis of Behavior*, 1959, 2, 323-334.
- Burdock, E. I., Hakerem, G., Hardesty, A. S., and Zubin, J. A Ward Behavior Scale for mental hospital patients. *Journal of Clinical Psychology*, 1960, 16, 246-247.
- Burdock, E. I. and Hardesty, A. S. *Ward behavior inventory manual*. New York: Springer Publishing Co., Inc., 1968.
- Burgess, R. L., Clark, R. N., and Hendee, J. C. An experimental analysis of anti-litter procedures. *Journal of Applied Behavior Analysis*, 1971, 4, 72-75.
- Kale, R. J., Zlutnick, S., and Hopkins, B. L. Patient contributions to a therapeutic environment. In R. Ulrich, T. Stachnik, and J. Mabry (Eds.), *Control of human behavior II*. Glenview, Ill.: Scott, Foresman & Co., 1970. Pp. 96-99.
- Leitenberg, H., Agras, W. S., Thompson, L. E., and Wright, D. E. Feedback in behavior modification: An experimental analysis of two phobic cases. *Journal of Applied Behavior Analysis*, 1968, 1, 131-137.
- Lindsley, O. R. The beautiful future of school psychology: Advising teachers. In M. C. Reynolds (Ed.), *Proceedings of the conference on psychology and the process of schooling in the next decade*. Minneapolis: U. of Minnesota Audio-Visual Extension, 1971. Pp. 116-120 (a)
- Lindsley, O. R. Precision teaching in perspective. *Teaching Exceptional Children*, 1971, 3, 114-119. (b)
- Panyan, M., Boozer, H., and Morris, N. Feedback to attendants as a reinforcer for applying operant techniques. *Journal of Applied Behavior Analysis*, 1970, 3, 1-4.
- Pomerleau, O. F., Bobrove, P. H., and Harris, L. C. Some observations on controlled social environments for psychiatric patients. *Journal of Behavior Therapy and Experimental Psychiatry*, 1972, 3, 1-7.
- Saslow, G. A case history of attempted behavior manipulation in a psychiatric ward. In L. Krasner and L. P. Ullman (Eds.), *Research in behavior modification*. New York: Holt, Rinehart & Winston, 1968. Pp. 285-304.
- Schaefer, H. H. and Martin, P. L. Behavior therapy for "apathy" of hospitalized schizophrenics. *Psychological Reports*, 1966, 19, 1147-1158.
- Schaefer, H. H. and Martin, P. L. *Behavioral therapy*. New York: McGraw-Hill, 1969.
- Siegel, S. *Non-parametric statistics for the behavioral sciences*. New York: McGraw-Hill, 1956.
- Wolfe, D. Training. In S. S. Stevens (Ed.), *Handbook of experimental psychology*. New York: Wiley, 1951. Pp. 1267-1286.

Received 28 February 1972.

(Revision requested 7 July 1972.)

(Final acceptance 7 May 1973.)