An Analysis of the Behavior Components of Psychoeducational Treatment for Persons With Chronic Mental Illness

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This article analyzes the outcomes of a psychoeducational treatment program for persons with chronic mental illness vis-à-vis four behavior components: acquisition, performance, generalization, and cognition. These four components serve as foci for organizing psychoeducational treatments and for program evaluation outcome measures. Results show that participants who completed the psychoeducational treatment improved their acquisition and performance of target behaviors as well as cognitive mediation. In addition, relapse rates greatly diminished for the treatment group as skills were increasing. A subsequent correlation among the variables representing the four behavior components suggested that acquisition, performance, generalization, and cognition are interdependent. Unfortunately, response generalization was not found to improve during the course of the study. A component analysis has implications for comprehensive development of future psychoeducational programs as well as guidance for subsequent evaluations.

Psychoeducational interventions comprise several treatment strategies which, in conjunction with neuroleptics, have been found to be effective in improving the functioning of people with chronic mental illness (Anthony, 1977; Anthony & Liberman, 1986; Bellack, 1986). These treatment strategies have evolved from the behavior therapy literature and include: skills training (Goldstein, 1981; Hersen & Bellack, 1976; Monti, Corriveau, & Curran, 1982; Wallace et al., 1980), token economies (Atthowe & Krasner, 1968; Ayllon & Azrin, 1968; Kazdin & Bootzin, 1972), and cognitive interventions (Hemsley, 1977, 1978; Magaro, Johnson, & Boring, 1986).

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Several studies have demonstrated the efficacy of singular as well as synergistic applications of these strategies. For example, Hogarty conducted a series of studies (Anderson, Reiss, & Hogarty, 1986; Goldberg, Schooler, Hogarty, & Roper, 1977; Hogarty et al., 1979; Hogarty, Goldberg, & Schooler, 1974) that demonstrated the relative utility of psychoeducational treatment in combination with medications and behavioral family therapy. When compared to neuroleptic treatment alone, psychoeducational treatment and drug therapy resulted in decreased relapse from 48% to 37% in one study (Hogarty et al., 1979) and to 20% in another (Anderson et al., 1986). Hogarty's research sorted out the relative influence of medications, psychoeducational rehabilitation, and behavioral family therapy.

Psychoeducational models of treatment for persons with chronic mental illness can be best understood in terms of the more comprehensive vulnerability models of schizophrenia (Nuechterlein & Dawson, 1984; Zubin & Spring, 1977). These models portray the autonomic hyper-reactivity and deficient information processing characteristic of the biological aspects of the condition as accounting for a range of behavior deficits. Psychoeducational treatment focuses specifically on the environmental and cognitive mechanisms that account for the original learning and subsequent maintenance of adaptive and maladaptive behaviors vis-a-vis this vulnerability.

Bandura (1969), and later Gagne (1977), distinguished between two components necessary for behaviors in an individual's repertoire to be available for use: the original acquisition and subsequent performance of those behaviors. Acquisition is a function of the individual’s operant and vicarious learning history. Contemporary performance of the acquired behaviors depends upon the individual’s expectations and perceptions of reinforcers in the environment. Gagne (1977) went on to describe yet a third component affecting behavior, generalization, the individual’s ability to use the behaviors in the repertoire outside of the environments in which training occurred. A final component is cognition, those internal mediators which affect the reception and processing of behaviors. Information processing models have been proposed to explain this phenomena (Ingram, 1986; Merluzzi, Rudy, & Krecji, 1986).

The four components of behavior production increase the explanatory power of psychoeducational conceptualizations of the interpersonal deficits associated with chronic mental illness. For example, problems may result from having never acquired a specific behavior during life stages where significant skills are learned because of the development of a severe mental illness. On the other hand, problems may result because skills may be in the repertoire but the person does not recognize situational incentives, thereby decreasing the likelihood that the appropriate behaviors will be performed. Also, behaviors may not general-
ize from training situations (e.g., a person may perform social behaviors well in a day hospital setting but may continue to manifest interpersonal deficits in a halfway house setting). Finally, cognitive deficits may result in diminished social cue recognition and response retrieval causing further problems in acquisition, performance, and generalization.

Given the implications for describing the deficits of persons with chronic mental illness, the four behavior components are useful in organizing the variety of interventions that have been used with this population. Acquisition is improved by skills training techniques used to facilitate prosocial, cognitive, and coping skills. These skills are usually taught in a classroom format with counselors as teachers and clients as learners. Performance is a function of contingency management with a wide range of reinforcers. This component includes token economies, punishment strategies, and the manipulation of social and cognitive contingencies. Generalization is improved by training participants in several settings. Transfer of skills is also enhanced by improving the contingency management skills of those individuals who frequently interact with clients (e.g., family, friends, residential, and vocational staff). Finally, cognitive deficits are improved, by neuroleptic maintenance and self-management techniques borrowed from the information processing literature to improve executive control over attention, memory, and response selection.

The four behavior components also provide a basis for the evaluation of psychoeducational treatment programs. This article summarizes an evaluation of a program organized around these four components, with outcome measures used to assess improvements in each area. In addition, the relationships among the four components—acquisition, performance, generalization, and cognition—were investigated. Strauss and Carpenter (1972, 1974) have found that outcome variables can be relatively independent of each other. Relationships, however, were expected among the component variables with acquisition of skills dependent on cognitive functioning, performance dependent on the previous acquisition, and generalization dependent on prior performance in training situations. These patterns of dependence would thus be expected in the form of moderate intercorrelations.

METHOD

Participants

A total of 24 adults with chronic mental illness were selected by the Illinois Department of Mental Health and Developmental Disabilities (IDMHDD) to participate in a psychoeducational program based on the four behavior components. The participants in the treatment group were
selected as being particularly resistant to treatment; participants had a long history of mental illness, frequent hospitalizations, and several failures in other outpatient programs. Diagnoses of schizophrenia conformed to Research Diagnostic Criteria as assessed by means of the Schedule for Affective Disorders and Schizophrenia (Spitzer & Endicott, 1978). At the time of the study, the participants lived in a large, sheltered community residence through which they received housing, food, physical care, and neuroleptic medication. Neuroleptic medication was administered by an independent psychiatrist and maintained at levels sufficient to permit community placement. Six participants were dropped from the study before it was completed and were therefore not included in the data analysis. Four of these participants moved out of the catchment area while two others decided not to continue in the study. The average age of the remaining sample was 28.6 years, and was comprised of 14 men and 4 women.

A control group of 15 adults with DSM-III diagnoses of schizophrenia was also selected randomly from a larger group (N = 30) identified by IDMHDD. Participants in the control had a less severe history of recidivism (an average of 3.5 inpatient days for the 6-month period prior to the study compared to 76.6 days for the treatment group during the same period), as well as fewer failures in outpatient treatment. The control group received residential care and medication comparable to the treatment group. In addition, they received case-management and group therapy. The control group consisted of 9 men and 6 women and had an average age of 30.7 years.

Interventions

The treatment group participated in an ongoing psychoeducational program (cf. Corrigan, Davies-Farmer, & Lome, 1988) that provided services 5 days per week, 5½ hours per day. The program included 30 training modules covering social and coping skills, adapted to the participant's cognitive deficits. For example, learning points in the "Interpersonal Problem Solving" module included identification of the problem, generation of several solution alternatives, selection of one of these alternatives, development of an implementation plan, and evaluation of the plan a few weeks after implementation.

The skills training was conducted in groups of 6 to 10 in a classroom format with a blackboard and audio-visual equipment for presentation of instructions. Instruction was provided by a single counselor with at least 1 year prior experience in skills training. In addition, an incentive program was included with a token economy and level system. Participants moved through eight levels as they demonstrated competence in the learning modules, gaining increased responsibility and status in
the milieu as they progressed. Training occurred in multiple environments (e.g., their residence, stores in the community, a sheltered workshop, family settings) to facilitate generalization. The treatment group also received case-management services.

Measures

Five measures were used. The number of hospitalization days was tallied for each participant in both treatment and control groups for the 6-month period prior to the beginning of the study, and for the subsequent 6- and 12-month periods. Eight participants in the control group moved out of the catchment area after the 1st year, and hospitalization data could not be collected for those individuals. The hospitalization data were then used as a basis for cost-benefit computations (Weiss, 1972). Individual per diem costs were determined for inpatient hospitalization, sheltered residential care in the community, case management, and psychoeducational treatment. Estimates for inpatient care were provided by IDMHDD, for residential care by two proprietary care centers, and for case management and psychoeducational treatment from the grants that funded the services. Total costs were then computed for each participant in each group. Total costs for the psychoeducational treatment group were compared to the cost of year-round inpatient care and to the total costs incurred by control group participants.

Acquisition, performance, generalization, and cognition were measured for the treatment group using four behavior instruments constructed for this study. In developing these instruments Beljack's (1979) advice was heeded, suggesting that observations of an individual's behavior in natural situations have greater validity than judgments made from artificially simulated situations. Therefore, judgments of the acquisition and performance of behaviors were based on the number of individual behaviors meeting criteria on each of 30 Behavior Checklists (BCLs) corresponding with the learning modules in the treatment condition. Sample items from the BCL for the “Problem Solving” module include “Client breaks problems into components” and “Client is able to pick a solution that is in his or her repertoire”.

Two independent raters completed the BCLs at intake and at subsequent 3-month intervals for the next 21 months. The raters were counselors in the psychoeducational program and were familiar with the levels of functioning of participants. A BCL item was judged to be acquired, but not performed, if a participant demonstrated the target behavior only in training situations with high levels of prompts or token contingencies. A BCL item was judged to be performed if a participant emitted the behavior at normative rates without extraordinary incen-
tives. A total BCL score for acquisition (BCL-Acq) and performance (BCL-Perf) equalled the cumulative ratings of items summed over all behaviors represented in the training modules. Interrater reliabilities were determined for each rating period with BCL-Acq correlations ranging from .48 to .94 for the 30 modules and BCL-Perf correlations ranging from .57 to .94.

In a separate attempt to validate these measures, BCL-Perf was correlated with the number of minutes in which targeted behaviors (e.g., talking with others, spending leisure time alone) were emitted on fixed interval schedules and the number of times other targeted behaviors (e.g., solving problems and completing rational thinking protocols) were emitted on fixed ratio schedules. The operant measures were added in the 12th month of the program for purposes of tracking the token economy. Correlations were determined for each subsequent rating period and varied from .26 to .50 with an average of .40 for ratio schedules, and .22 to .82 with an average of .54 for interval schedules.

In addition to rating acquisition and performance, generalization to a broad range of independent behaviors was rated. Schmerler, Franzblau, and Fishman (1982) developed the BASIC I.D. Profile for Planning and Evaluation to measure skills deficits over Lazarus’s (1976) seven behavior modalities. The instrument was revised by Corrigan, Davies, Pecora, and Flaxman (1987) (BIPPER) and included five items per modality. Participants were rated using the BIPPER at intake, and at subsequent 6-month periods, by the same independent raters, with interrater reliability estimated at .73, and test-retest reliability over the 6-month intervals at .59.

The Cognitive Scale (C Scale) of the BIPPER assessed cognitive components of behaviors characteristic of schizophrenic thought disorder. This scale had been found to be significantly correlated with the F scale of the MMPI in previous research (r = .36) with high scores on the F scale having been shown to suggest psychosis (Blumberg, 1967) and extreme disorganization (Greene, 1980). Interrater reliability for the C Scale was estimated at .66 and test-retest reliability over the 6-month intervals at .73.

RESULTS

The mean number of inpatient days for the treatment and control groups over three 6-month periods are presented in Figure 1. Using the Mann-Whitney U test, a significant difference was found between the treatment and control group at pretreatment $U = 45.4$, $p < .05$. Due to a steep decline in hospitalization rates for the treatment group, no differences between groups, however, were found at either of the two subsequent time periods. Thus, the treatment group attained a level of functioning
similar to another higher functioning group of persons with chronic mental illness who had been able to survive successfully in the community. This change represented an 85.2% decrease in days of hospitalization for the treatment group while the control group remained stable.

Results of the cost-benefit analysis for 1 year were also positive. Comparison of costs of treatment for the psychoeducational group to costs of year-round inpatient hospitalization showed a 57.5% lower cost for the community treatment, corresponding to $29,183 less per person, per year. Moreover, the costs of the treatment program were 22.1% less than the cost of maintaining the same individuals in case management.

**FIGURE 1**

Inpatient hospitalization days for 6 months prior to treatment and for 12 months of treatment.
only. Psychoeducational treatment was less expensive in large part because, participants in the treatment group required expensive hospitalization less frequently than prior to treatment when they only received case management.

The means and standard deviations on behavior measures for the treatment group are reported in Table 1. A repeated measures ANOVA was conducted on the BCL-Acq, BCL-Perf, C Scale of the BIPPER, and the total BIPPER score. Significant results were found for the C Scale, $F(3,27) = 4.3, p < .05$, suggesting that cognitive deficits diminished over the course of the study. Similarly, significant findings were demonstrated for BCL-Acq, $F(7,77) = 32.97, p < .001$, and BCL-Perf, $F(7,77) = 8.75, p < .001$. Thus the treatment appeared to result in improvements in both the acquisition and performance of behaviors. No evidence, however, was found that the total BIPPER scores improved, $F(3,27) = 1.26$, n.s. This result suggested that the treatment group did not generalize behaviors that had been acquired or performed in the training environment.

Table 2 summarizes the intercorrelations between component scores at intake and at subsequent intervals. There appeared to be a clear pattern of association between the four components with the strongest association between BCL-Acq, and BCL-Perf ($M r = .86$). The total BIPPER score, representing the generalization component, correlated consistently high with the other three components ($M r = .61$). These findings suggested dependence of the four components on one another.

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**TABLE 1**

Means and Standard Deviations of BCL-Acq, BCL-Perf, C Scale BIPPER, and Total BIPPER

<table>
<thead>
<tr>
<th>Months</th>
<th>BCL-Acq</th>
<th>BCL-Perf</th>
<th>C Scale BIPPER</th>
<th>Total BIPPER</th>
</tr>
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<tr>
<td>0 M</td>
<td>58.3</td>
<td>44.1</td>
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<td></td>
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<tr>
<td>SD</td>
<td>19.4</td>
<td>20.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 M</td>
<td>69.7</td>
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<td>15.4</td>
<td>100.5</td>
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<tr>
<td>SD</td>
<td>23.4</td>
<td>25.3</td>
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<tr>
<td>6 M</td>
<td>73.9</td>
<td>53.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>21.6</td>
<td>23.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 M</td>
<td>78.6</td>
<td>58.1</td>
<td>13.6</td>
<td>93.6</td>
</tr>
<tr>
<td>SD</td>
<td>21.9</td>
<td>22.9</td>
<td>3.4</td>
<td>18.2</td>
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<tr>
<td>12 M</td>
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<td>62.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
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<td>19.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 M</td>
<td>87.5</td>
<td>63.3</td>
<td>12.6</td>
<td>93.1</td>
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<tr>
<td>SD</td>
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<td>18 M</td>
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<td>64.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>14.9</td>
<td>22.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 M</td>
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<td>69.6</td>
<td>10.8</td>
<td>86.4</td>
</tr>
<tr>
<td>SD</td>
<td>18.6</td>
<td>27.0</td>
<td>2.4</td>
<td>18.8</td>
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TABLE 2
Intercorrelations of Component Measures at Intake and Every 6 Months

<table>
<thead>
<tr>
<th></th>
<th>BCL-Perf</th>
<th>C Scale BIPPER</th>
<th>Total BIPPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCL-Acq</td>
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<td></td>
</tr>
<tr>
<td>intake</td>
<td>.77**</td>
<td>.03</td>
<td>.21</td>
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<tr>
<td>6 mos</td>
<td>.88**</td>
<td>.36</td>
<td>.65**</td>
</tr>
<tr>
<td>12 mos</td>
<td>.85**</td>
<td>.28</td>
<td>.62**</td>
</tr>
<tr>
<td>18 mos</td>
<td>.93**</td>
<td>.70**</td>
<td>.89**</td>
</tr>
<tr>
<td>BCL-Perf</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>intake</td>
<td></td>
<td>.20</td>
<td>.51*</td>
</tr>
<tr>
<td>6 mos</td>
<td>.61**</td>
<td>.75**</td>
<td></td>
</tr>
<tr>
<td>12 mos</td>
<td>.50*</td>
<td>.71**</td>
<td></td>
</tr>
<tr>
<td>18 mos</td>
<td>.71**</td>
<td>.73**</td>
<td></td>
</tr>
<tr>
<td>C Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>intake</td>
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<td>.76**</td>
<td></td>
</tr>
<tr>
<td>6 mos</td>
<td>.78**</td>
<td>.72**</td>
<td></td>
</tr>
<tr>
<td>12 mos</td>
<td>.78**</td>
<td>.83**</td>
<td></td>
</tr>
<tr>
<td>18 mos</td>
<td></td>
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</table>

*p<.05, **p<.01.

DISCUSSION

The reduced hospitalization rates and lower costs observed for the psychoeducational treatment group, when compared to a higher functioning control group, were encouraging. Despite the need for increased commitment of treatment time and associated increases in costs associated with the psychoeducational treatment, overall costs appeared to be greatly reduced when compared to year-round inpatient costs, and were also favorable when compared to costs incurred by the control group.

Results also suggested that the psychoeducational treatment was associated with the acquisition and subsequent performance of a broad range of social and coping skills, as well as diminished cognitive deficits characteristic of chronic mental illness. No change was demonstrated, however, in response generalization. This finding was consistent with several studies which have shown poor generalization of effects (Bellack, Hersen, & Turner, 1976; Falloon, Lindley, McDonald, & Marks, 1977; Liberman, et al, 1978). A longer time period would be required to determine generalization of skills over time. Anecdotally, however, the five graduates of the program all moved on to function successfully in a more independent work program.

The results of the Pearson correlations suggest a consistent association between components. Future research needs to analyze these associations in greater depth. Specifically, stepwise regression analysis
can determine the hierarchical dependence of these components; that is, whether in fact acquisition is dependent on cognition, performance is dependent on cognition and acquisition, and generalization is dependent on all three.

Limits in the design of this study suggest the need for additional investigation of the four components. The reliability of the behavior measures was low. In addition, the inability to randomly assign persons to treatment groups made it difficult to eliminate alternative hypotheses in explaining the observed results. Moreover, the lack of behavior ratings on the control group prevented comparisons on the component measures. Future research is needed to determine whether the positive findings here can be replicated.

A component view of psychoeducational treatment has implications for the development and organization of the various behavior technologies that have been found useful with persons with chronic mental illness. A comprehensive intervention package should include a broad-based skills training strategy to improve acquisition, manipulation of environmental contingencies to improve performance, and training in multiple situations with family, friends, and other mental health personnel to improve generalization. These interventions should be carried out using skills to ameliorate the cognitive dysfunctions that mediate the other three components. Subsequent program evaluations based on these components can help to pinpoint limitations in any individual component. A program that is unable to help clients remain out of the hospital can determine which component is ineffective and adjust the level of intervention in that area.

The results of this study also refute the recent public movement supporting reinstitutionalization (Gruson, 1987; Loeb, 1987). The argument is based on the belief that treatment refractory individuals exist—groups that are unresponsive to community treatment and, therefore, require year-round inpatient treatment. This study suggests that persons with chronic mental illness can be treated successfully in the community. The cost analysis has shown that this community treatment is also less expensive than inpatient care.

REFERENCES


