

**Reports from the Research Laboratories**  
of the  
**Department of Psychiatry**  
**University of Minnesota**

**An Experimental Approach  
Involving Conditioning  
Factors in Chronic Alcoholism**

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and Roland Griffiths**

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An Experimental Approach Involving Conditioning  
Factors in Chronic Alcoholism<sup>1</sup>

Roy Pickens, George Bigelow and Roland Griffiths<sup>2</sup>  
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According to the operant-conditioning interpretation of drug dependence, alcoholism is controlled by the same factors that control other types of operant behavior. Depending on a number of conditioning factors, the behavioral control exercised by alcohol may range from moderate to severe. In the case of the skid-row alcoholic, behavior is controlled almost entirely by alcohol. By occurring often and in many situations, drinking has become controlled strongly by many different discriminative stimuli. The behavior that leads to drinking eventually predominates over behavior maintained by other reinforcers, with less and less behavior controlled by those reinforcers and more and more behavior controlled by drinking. Any treatment program for chronic skid-row alcoholics should involve altering the discriminative control that has been acquired over drinking and establishing alternative reinforcers to strengthen non-drinking behavior.

In a pilot investigation conducted in the Psychiatry Ward of the University of Minnesota Hospitals, a chronic skid-row alcoholic was involved in such a treatment program. In a four-phase program he was first given free access to alcohol to determine the frequency, amount, and

situational conditions under which drinking occurred. Based on observations during that phase, a behavior modification procedure was employed to eliminate drinking. Afterward, some of the discriminative control associated with binge drinking was altered using a stimulus fading procedure. Finally, an attempt was made to establish new behaviors using non-drug reinforcers.

The patient was a 29-year old unmarried male alcoholic. Prior to entering the research project, he had been treated for chronic alcoholism seven times involving several different treatment approaches, none of which were successful. He was brought into the hospital on October 7, 1970, given physical and psychological evaluations, and told the purpose of the experimental research project. He was then given free access to alcohol. For a six-week period the patient received a drink containing one ounce of bourbon and one ounce of water each time he requested it from the nursing staff. Drinks were available 24 hours a day, seven days per week, and no restriction was placed upon the number of drinks or time between drinks.

Figure 1 shows the daily number of drinks over the six-week period. As can be seen, the number of drinks per day remained relatively constant, with no

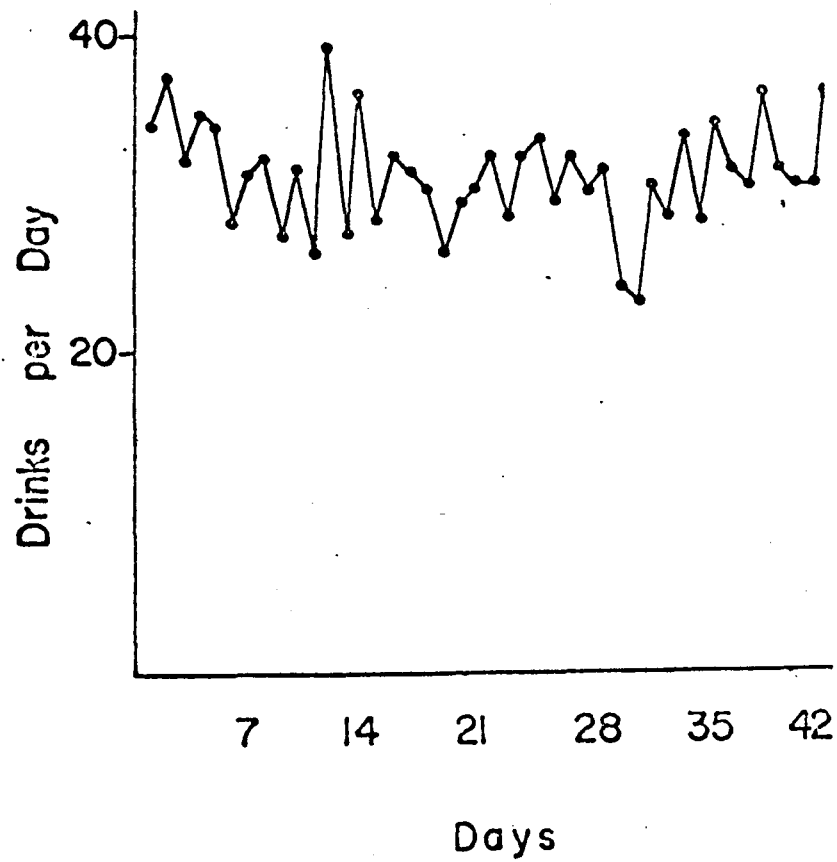


Figure 1. Number of drinks per day over six-week baseline period. Each drink was one-ounce bourbon and one-ounce water plus ice.

visible trends in daily drinking amount. A mean of 30.7 ounces of bourbon was consumed each day. Figure 2 shows the distribution of drinks per hour over the six-week period. Points on the graph indicate the cumulative number of drinks consumed at a given hour over the entire baseline period. The graph as a whole is suggestive of the daily pattern of drinking. Drinking occurred at a relatively high frequency early in the morning (8-9 a.m.), then decreased in the middle of the day (2 p.m.) and increased again in the late afternoon (5 p.m.) and early evening (7-8 p.m.).

During the six-week period of free access to alcohol, observations of behavioral factors associated with drinking were made by the staff. After a few weeks it became apparent that the patient liked to talk to people while drinking. Further, he reported difficulty in socializing if not drinking. The patient's pattern of behavior was typically that of first obtaining a drink and then socializing with other patients and staff. On the basis of these observations, a program was implemented in which the contingency between alcohol drinking and socialization was reversed. To obtain a drink the patient was required to carry on a conversation with a staff person for one minute but once the drink was obtained no talking and

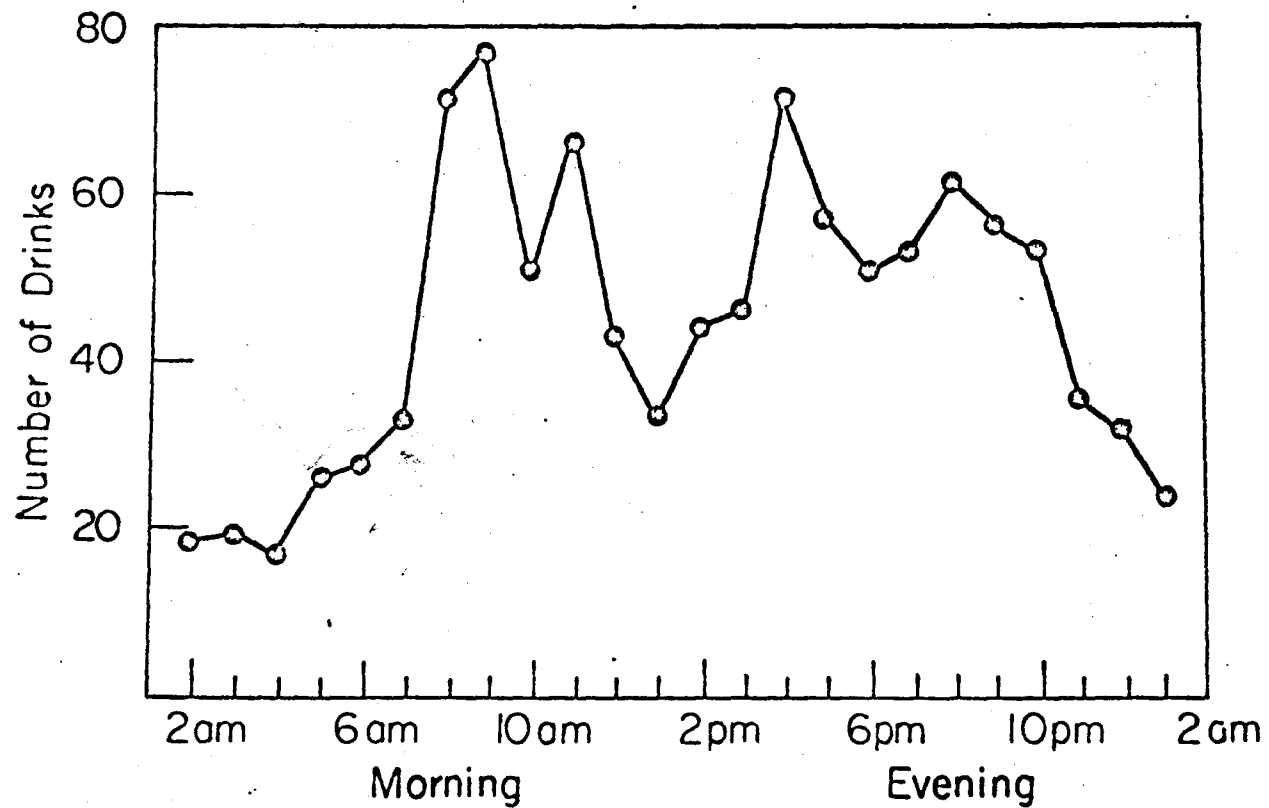


Figure 2. Sum of drinks during each hour of each day over six-week baseline period.



socializing was then allowed for the next ten minutes. During this time the patient was confined to his room in social isolation. Over the next four weeks, the amount of alcohol consumed per day gradually decreased until on December 29, 1970, the patient stopped drinking entirely. Figure 3 shows the stable six-week baseline period of free access to alcohol, followed by the gradual decrease in drinking resulting from the treatment procedure. As the graph shows, daily alcohol intake initially decreased gradually and then more abruptly until drinking ceased altogether. Over the next four weeks, two drinking binges of about one week each were seen, after which the next phase of the program was begun.

In the third phase, the discriminative control of uncontrollable drinking was studied. First, the patient was asked to rank order the situations most frequently associated with uncontrollable drinking. Table 1 shows the rank order of such situations. Most of the situations appear to involve the presentation of discriminative stimuli that were acquired through the process of conditioning. It was decided to alter some of the stimulus control of drinking by using a stimulus fading procedure. Stimuli more and more closely associated with drinking were presented in a controlled manner until

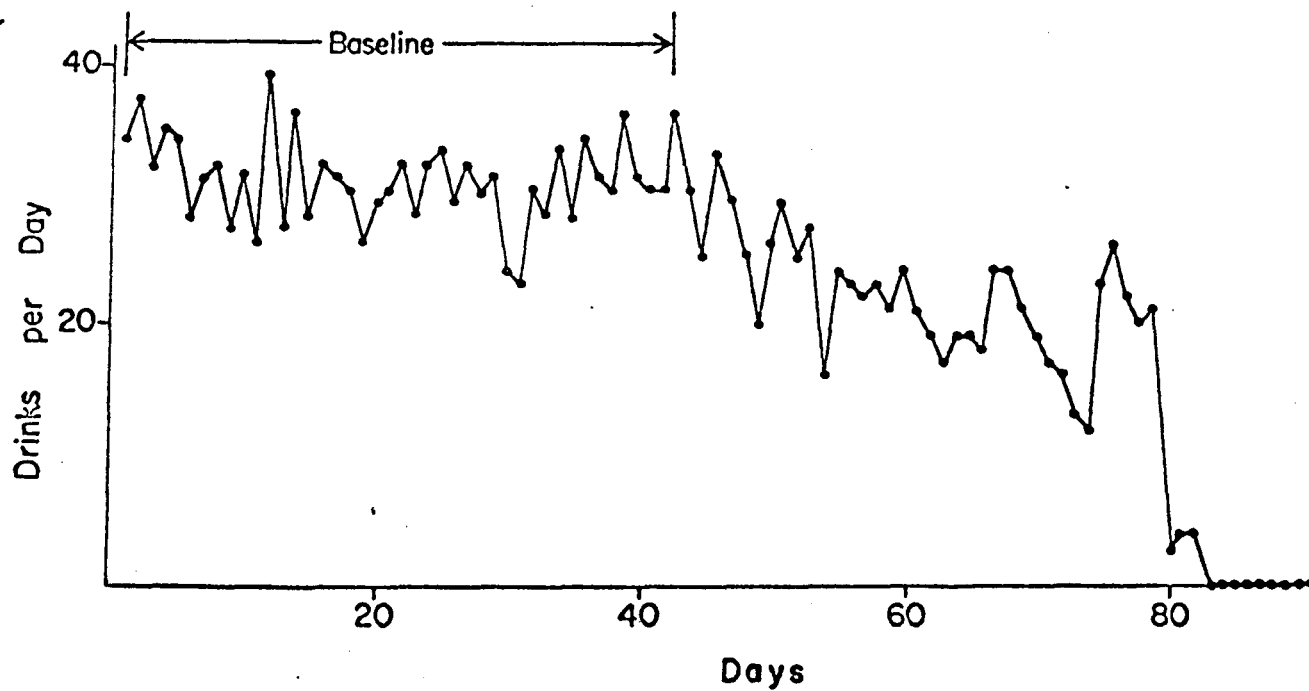


Figure 3. Effects of reversing drinking-socialization contingency on number of drinks per day.

Table 1

DRINKING SITUATIONS

1. After having one drink
2. When nervous
3. Where others are drinking
4. Having a lot of money
5. At parties
6. Before dates
7. When must talk before groups
8. Being in a large, quiet crowd
9. On holidays
10. When liquor is present
11. When hungry
12. Smelling liquor on someone's breath
13. Meeting former drinking companions
14. Walking in liquor store
15. Seeing liquor advertisement

the patient no longer reported wanting a drink. The presentation of each stimulus occurred immediately before some scheduled activity such as eating a meal, therefore decreasing the probability that it would elicit a drinking episode. The patient was gradually exposed to events more and more closely associated with drinking until drinking itself was finally achieved.

The procedure employed is shown in Table 2. As can be seen, the patient was initially required to simply sniff bourbon from a bottle. Later he was required to taste and drink bourbon. At the end of this program the patient was able to drink two full drinks a day without going on to further drinking.

During the latter part of the fading procedure, when drinks of one ounce were being used, the patient was instructed to decrease the magnitude of each sip and increase the time between sips. Figure 4 shows changes in sip magnitude that occurred over the course of the study. The sip magnitude reported by Schaefer, Sobell and Mills (1971) for both normals and alcoholics are shown by dashed lines. The slash mark on the horizontal axis indicates a two-month period of essentially no change in which the data were deleted to conserve space. The estimated sip magnitude prior to treatment is shown

Table 2

NUMBER OF SESSIONS	BEHAVIORAL REQUIREMENT	VOLUME ALCOHOL CONSUMED
10	sniff from bottle	
23	sniff from glass on table	
18	sniff from glass and lift glass	
10	taste (dip finger and touch lips)	
14	sip from spoon	.17 oz
16	drink from glass; no talking	.17 oz
9	drink from glass: no talking	.17 oz with water
10	drink from glass; no talking	.33 oz with water
20	drink from glass: no talking	.50 oz with water
10	drink from glass; no talking	.63 oz with water
14	drink from glass: no talking	.73 oz with water
8	drink from glass: no talking	.80 oz with water
47	drink from glass; no talking	1.00 oz with water
54	no talking after 1 minute	1.00 oz with water
18	no talking after 4 minutes	1.00 oz with water

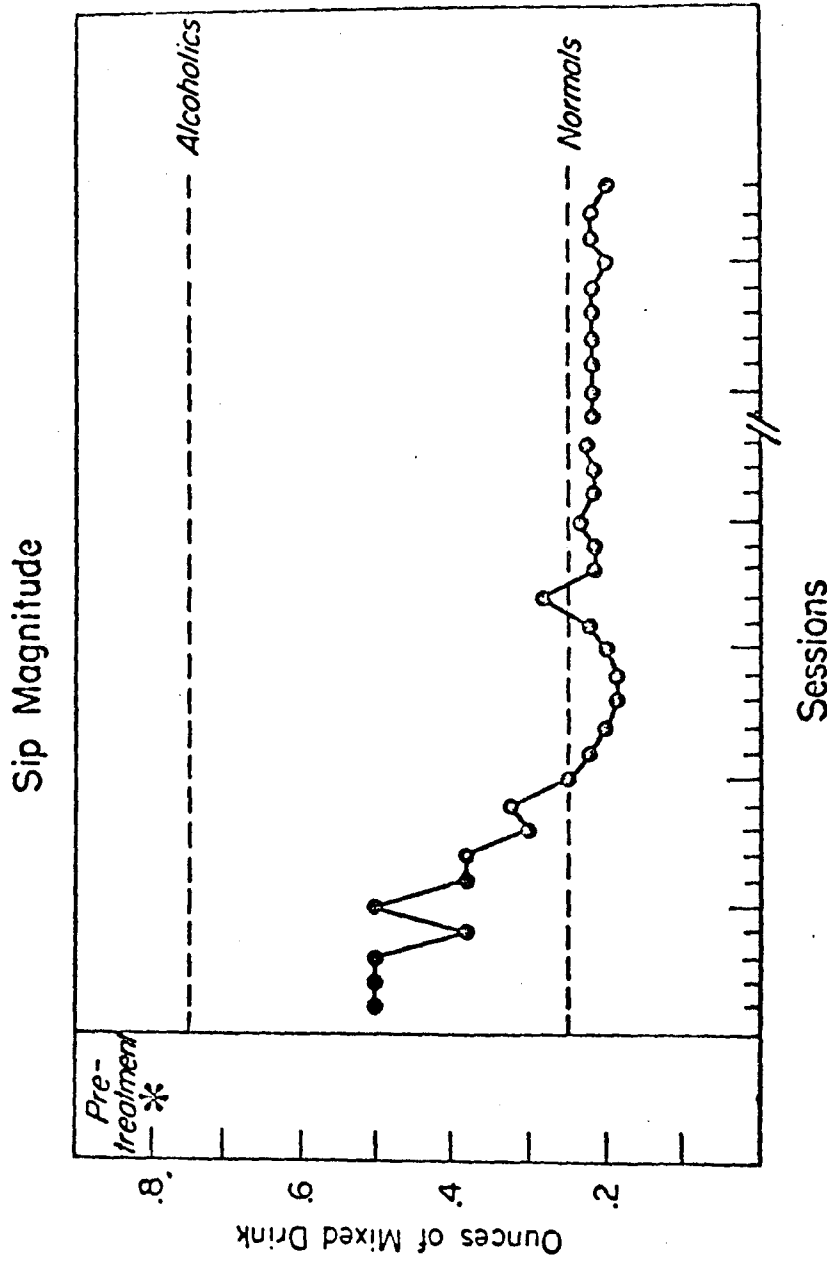


Figure 4. Change in sip magnitude over the course of the experiment.

at the left of the graph. The number is based upon both patient and staff report of drinking behavior. To the right of the pretreatment value are the sip magnitudes over the remainder of the experimental sessions. As can be seen, mean sip magnitude decreased gradually over time, reaching the value reported for normals.

Figure 5 shows the rate of drinking over the same time period. The slash marks on the horizontal axis again indicate two months of omitted data showing essentially no change. As can be seen, the rate of drinking decreased gradually over time. The final rate of drinking approximates normal drinking, taking ten to fifteen minutes to finish a single drink.

In the fourth phase of the program, an attempt was made to establish alternative reinforcers to maintain behavior incompatible with drinking. Since the patient essentially had no previous work experience, he was initially required to perform simple routine jobs in our research laboratories with the amount of work gradually increasing until two hours of work each day were obtained. In cooperation with the Minnesota State Department of Vocational Rehabilitation and the Minneapolis Rehabilitation Center, the patient was given exposure to many job situations, and funds were provided

### Rate of Drinking

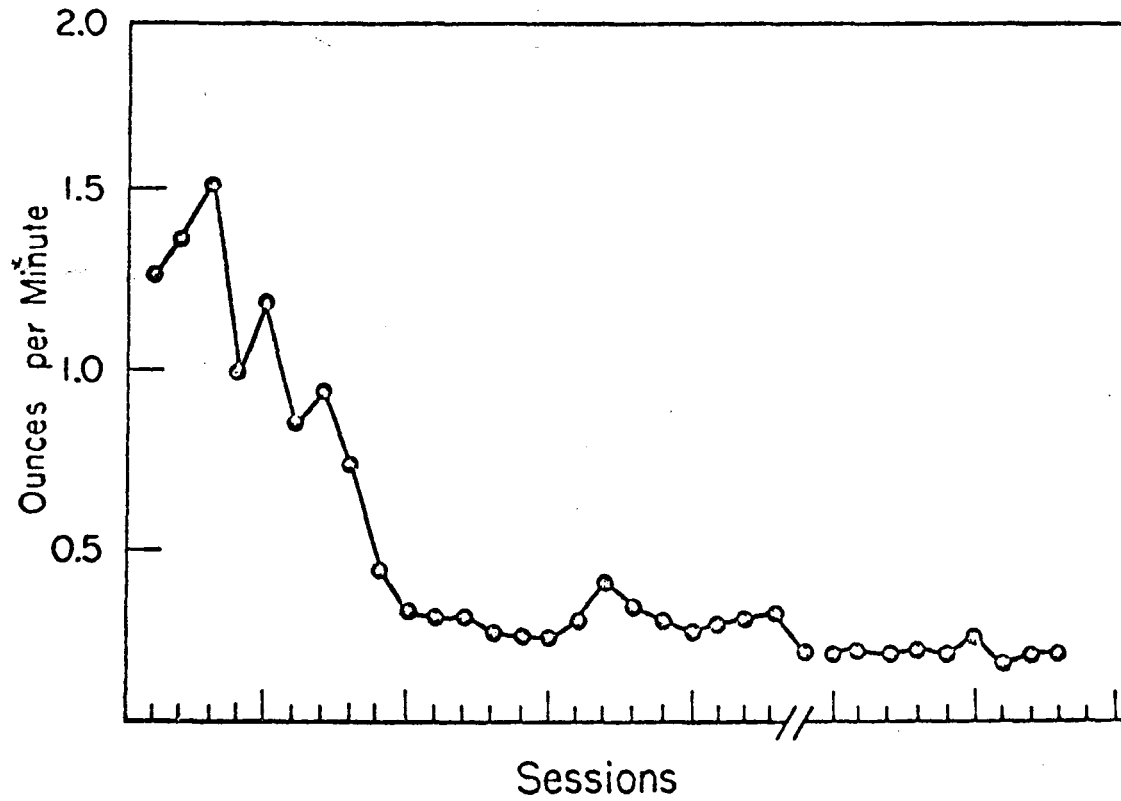


Figure 5. Change in drinking rate over the course of the experiment.



for training as necessary in new job situations.

The patient was discharged from the hospital, on September 7, 1971, after he had obtained an apartment and money for maintenance support. Between Phase Two and the discharge date, the patient experienced two drinking episodes on June 15, 1971 and August 29-30, 1971, both of which occurred outside the hospital. He is presently working half-time with prospects of full-time employment.

Because the patient is a skid-row alcoholic with long involvement with alcohol and very little alternative behavior, his prognosis would ordinarily be considered extremely poor. Altering the discriminative control over drinking and establishing new behavior, however, may increase chances of success somewhat. Follow-up data based on the ability of the patient to hold a job (rather than total abstinence) will be collected to evaluate the usefulness of the approach.

Reference

Schaefer, H. H., Sobell, M. B. and Mills, K. C. Baseline drinking behaviors in alcoholics and social drinkers: Kinds of drinks and sip magnitude. Behavior Research and Therapy, 1971, 9, 23-27.