*MODELING INFLUENCES ON ALCOHOLICS'
RATES OF ALCOHOL CONSUMPTION*

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Two experiments were designed to examine modeling influences on alcoholics' alcohol consumption. Three male alcoholics were paired with confederates, posing as alcoholics. In Experiment 1, alcoholic-confederate pairs participated in a 1-hour taste-rating task, which involved rating different wines on a list of adjectives. Experiment 2 consisted of 1-hour ad lib access to wine in a naturalistic bar setting. In both experiments, confederates alternated 15-minute periods of heavy and light consumption, drinking fluids resembling wine. The amount of wine consumed by alcoholics in each period was secretly recorded and the data examined on a single subject basis. In Experiment 1, two subjects increased and decreased consumption along with their confederate. The third subject followed the confederate's pattern only after the confederate demonstrated heavy consumption. All three subjects varied consumption with the confederate during Experiment 2, performed later on the same day. These results suggest that alcoholics' alcohol consumption can be modified by the social influences of modeling. The implications of this finding for the loss of control hypothesis and alcoholism treatment maintenance were discussed.

DESCRIPTORS: alcoholism, modeling influences, analogue research, social influence, observational research

Recent research findings suggest that situational factors can increase or decrease alcohol consumption by alcoholics. For example, alcoholics' consumption has been shown to increase in situations requiring interpersonal assertion (Miller, Hersen, Eisler, & Hilsman, 1974) and decrease when access to an enriched environment is made contingent upon moderation (Bigelow, Cohen, Liebson, & Faillace, 1972). In view of these results, assessment of situations likely to influence drinking seems critical to effective alcoholism treatment.

One situational variable known to influence behavior is modeling by another person (Bandura, 1969). Recent studies have demonstrated that modeling can increase or decrease the alcohol consumption of social drinkers. The first such demonstration was in a laboratory analogue study performed by Caudill and Marlatt (1975). In this study, a taste-rating task was used as an unobtrusive measure of alcohol consumption rates to compare groups of heavy drinkers who either drank alone or in the presence of light or heavy consumption models. Results were that subjects paired with the heavy consumption model took more sips, drank more alcohol, took larger sips, and reached a higher blood alcohol level (BAL) than subjects in the no-model control group or low consumption modeling conditions. In this laboratory analogue, modeling was a powerful determinant of subjects' alcohol consumption.

The laboratory setting was altered to a naturalistic bar-type situation in a subsequent study of Garlington and DeRicco (1977). Three sub-

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jects participated in a study on "normal drinking patterns" and were each paired with an experimental confederate. Subjects were asked to drink normally during 1-hr sessions, while observers coded their behaviors. During an initial baseline condition, confederates matched subjects' drinking rates. Two confederates then increased their drinking level while the third drank less. Procedures were reversed in the next condition, followed by a return to baseline. Results of this study revealed that subjects increased or decreased their consumption to match the confederate's drinking rate. Thus, in a semi-naturalistic bar setting, results were similar to those in an experimental analogue: modeling affected subjects' alcohol consumption rates.

A third study extended laboratory results to the completely natural setting of a public tavern. Reid (1978) trained confederate models to vary consumption and act in a warm or cold fashion toward randomly selected subjects at a bar. Ratings of subjects' alcohol consumption were made by trained observers. These ratings revealed that in the warm interaction condition, subjects paired with heavy consumption models consumed significantly more alcohol than subjects with low consumption models or than randomly selected control subjects who received no model. No consistent differences were found between subjects in the cold interaction condition, suggesting that interpersonal perceptions may modify modeling influences. Despite this qualifier, modeling was again shown to be an important factor in drinking consumption.

The results of this series of studies suggest that it may also be possible to alter the alcohol consumption of alcoholics through modeling procedures. Although researchers have previously suggested the use of *in vivo* modeling to train alcoholics to reduce consumption (Gothelil, Corbett, Grasberger, & Cornelison, 1972), no one has determined whether this is possible. This may be due in part to the adherence of some researchers and theoreticians to the disease model of alcoholism (Jellinek, 1960) which posits that a physiological loss of control occurs

after the alcoholic's first drink, precluding subsequent moderation. More recently, Keller (1972) concluded that loss of control may occur only after attainment of a sufficiently high blood alcohol level. In either case, it is assumed that attempts to modify all but minimal consumption through modeling would be ineffective. The current research was designed to examine this assumption and represents the first attempt to demonstrate *in vivo* modeling influences with alcoholics. Alcoholic subjects were allowed two 1-hr periods of *ad lib* access to wine, with alternating conditions of light and heavy consumption modeling. It was hypothesized that the social influence of modeling would alter consumption rates, even after a moderate blood alcohol level had been obtained.

Two different *ad lib* drinking periods were employed in the current research so that modeling effects could be examined in two settings. The use of multiple settings in the aforementioned series of studies with social drinkers demonstrated that modeling effects were not confined to a laboratory analogue. In a similar fashion, modeling should be demonstrated to influence alcohol consumption by alcoholics in both laboratory analogue and more natural settings.

To accomplish this, two separate modeling experiments were designed, using single-subject designs with three alcoholics. The first experiment utilized the taste-rating task procedure. Following this, a second study with the same alcoholics was designed to examine modeling influences in a bar-room setting with which the subjects were quite familiar. In both studies, it was hypothesized that modeling would influence alcoholics' drinking.

EXPERIMENTAL PROCEDURES

Subjects

Subjects were three male gamma-type alcoholics (Jellinek, 1960), aged 43 to 47. These men were selected from a larger number interviewed in a men's shelter located in the Bowery

district of New York City. Subjects were selected on the following criteria: (a) a history of problem drinking for more than 15 years, (b) a history of previous treatment for alcoholism, (c) no history of neurological disease or psychotic disorder, (d) no medical problem that would specifically counterindicate alcohol consumption, (e) no current medical treatment or medication regime, and (f) no interest in attaining abstinence or receiving treatment for alcoholism. This information was corroborated by medical records, interviews with subjects, and interviews with social workers. In addition, each subject was given a series of medical tests (ECG, chest x-ray, urinalysis, SMA-18, CBC) which were reviewed by a physician.

During the recruitment interviews, potential subjects were informed that they could participate in a 3-week series of studies on the effects of alcohol. They were offered \$60 per week plus room and board for participation. Finally, subjects were assured that participation was entirely voluntary and that they could withdraw at any time with payment on a pro rata basis.

Confederates

Confederates were two social-drinking males, ages 33 and 39, respectively. Each previously had been a participant in a blood alcohol level discrimination study such as the one the alcoholics had just finished. Both came casually dressed in older clothes. Since only two men of comparable age to the alcoholics were available, subjects A and C were run with the same confederate. The alcoholics were restricted to their rooms during both experiments so that they would not know two of them were paired with the same man. Procedures for the confederates' drinking and behavior were highly standardized through an 8-hr training session. Confederates were paid \$3 per hr for training and experimental sessions.

Setting

The research was carried out at the Alcohol Behavior Research Laboratory (ABRL), Rutgers University. This four-bed inpatient research fa-

cility has been described in detail elsewhere (Nathan, Goldman, Lisman, & Taylor, 1972). The current two experiments were performed during one day, 48 hr after subjects completed a 2-week blood alcohol level discrimination training experiment. During the blood alcohol level study, alcohol in the form of 80 proof vodka was given every other day on a programmed basis.

Introduction to Subjects

On the day before the current two experiments, subjects were told that they would participate in two taste discrimination tasks in the morning and evening of the following day. Subjects were also informed that these studies required more than three subjects, necessitating the inclusion of several former laboratory participants who were described as "heavy drinkers like yourself from a previous study we conducted here on blood alcohol level discrimination." These "heavy drinkers"—in fact, the confederates—were said to live in the area and to be available on an outpatient basis.

EXPERIMENT 1

Procedure

Subjects were served a light breakfast at 7:30 a.m. At 9:00 a.m., Subject A was brought to the experimental room and introduced to Confederate A. The two men sat opposite each other at a 5-foot-long table. Prior to instructions, both signed a consent form stating that they would compare the taste of different wines. This form also indicated that subjects had the right to discontinue participation in the study at any time and that all data would be kept confidential.

Taste rating task. The following instructions were read to all subjects:

This morning's study deals with the ability to make fine taste discriminations with wines. You will be making taste comparisons with three different wines, a burgundy, a rosé, and a white wine, during each of

four sessions. During each session you will be presented with different brands of burgundy, rosé, and white wines. Each of the wines differs in some important way from the others, along such factors as year of vintage, area of origin, and type of grape used in making the wine. In each session you each will be presented with three bottles of wine along with three glasses and a list of adjectives to make your ratings on. We are using identical bottles for each of the three wines in each of the four sessions. This is to prevent you from recognizing what brand of wine you are drinking at any one moment in time.

Taste ratings were made by examining the list of adjectives such as "hearty," "dry," or "bitter" and deciding which wine was most and least like each descriptor. Subjects were told to drink as much or as little wine as necessary to make accurate ratings. The importance of accuracy was stressed; participants were told they did not have to finish the adjective list and were urged to skip over any adjectives they did not understand. Finally, participants were told that the taste task would last about 1 hr, but the length of each individual session would vary. In reality, each of the four sessions lasted exactly 15 min.

Following instructions, the subject and confederate were each presented with 3 unlabeled green-tinted wine bottles filled with a premeasured amount (1270-1290 ml) of fluid, 3 clear glasses, and an adjective checklist. After 15 minutes, these items were removed and replaced by a fresh set. The fluid remaining in the bottles was secretly measured in an adjoining room to determine total consumption. This procedure was repeated until all four sessions were completed. The actual fluid in the green bottles was Gallo™ white, rosé, or burgundy wine for the alcoholics, and mixtures derived to look like these wines for the confederates. The confederates' "burgundy" was a 50% mixture of wine and grape juice. The "rosé" was composed of water, cherry drink, and grape drink. "White

wine" was made from 50% water and 50% apple juice. These mixtures could not be discriminated visually from real wine by the laboratory staff.

The 1-hour session was monitored by a video camera unobtrusively mounted in the room. Participants were accustomed to seeing video cameras, because this and other units were present throughout the preceding 2-week blood alcohol level discrimination study. Two observers independently viewed the sessions on two video-monitors and rated the number of sips taken by the confederate in each session. At the end of the fourth session, the subject returned to his room, and Subject B was matched with Confederate B. Later, Subject C was matched with Confederate A. Order of participation and confederate matching were randomly determined.

Confederates' behavior. Confederates were trained to consume either 800 ml (heavy consumption) or 125 ml (light consumption) of fluid in 15-min blocks by varying sip size, but not the total number of sips. During the taste task, each confederate was to complete 27 taste comparisons (one of three sheets of adjectives) in 15 min and take exactly 81 sips (an average of 3 sips per rating). Total consumption alternated between 800 and 125 ml in the four 15-min sessions. Because reductions in consumption were of primary experimental interest, two subjects (A and C) were paired with the same confederate in the heavy-light-heavy-light consumption condition ordering. Subject 2 was given the opposite ordering: light-heavy-light-heavy.

Dependent Measures

For the confederates, number of sips, number of adjectives, and total fluid consumed were calculated in each session to ensure that they followed training instructions. Subjects' total consumption in each session was examined on a single-subject basis. The components of total consumption, i.e. size and frequency of sips, were not of primary interest and were left as future topics for modeling research. The number of adjectives rated in heavy and light conditions was

also calculated to ensure that task orientation was not a factor in any between-session differences in consumption.

Results

Confederates' behavior. Confederates consumed an average of 814 ml in the heavy consumption conditions (range = 790 to 835) and 136 ml in the light consumption conditions (range = 112 to 162). The number of adjectives averaged 27 (range = 26 to 28), and the number of sips averaged 81 (range = 78 to 84).

A reliability percentage was calculated between the observer ratings of number of sips taken by the confederate in each session. The mean of these percentages—computed by dividing the smaller by the larger rating and multiplying by 100—was 98%, indicating that observers' ratings were highly reliable. These data suggest that confederates followed training instructions accurately, varying total consumption between heavy and light conditions, without varying the number of sips taken or adjectives rated.

Subjects' consumption data. Figure 1 depicts the total amount of wine consumed by Subjects A, B, and C in each of the four sessions. The results for each subject will be examined individually, beginning with Subject A.

Fig. 1. Total wine consumed (ml) by each subject in heavy (H) and light (L) consumption modeling conditions, during the taste-rating task.

In the initial heavy consumption modeling condition, Subject A consumed 519 ml of wine. This amount declined 75% to 134 ml in the light consumption modeling session. As the confederate repeated the heavy and light consumption sequence, Subject A responded with a 41% increase (228 ml) followed by a 59% decrease (94 ml). In summary, Subject A increased and decreased consumption with the confederate throughout Experiment 1.

Subject B received the reverse order of consumption conditions from that of Subject A. As can be seen in Figure 1, Subject B began the sessions by drinking 500 ml in a light modeling condition. Contrary to expectation, he reduced his consumption 15% in a heavy modeling condition (423 ml). In the following consumption conditions, Subject B reduced intake by 40% (253 ml) in the light condition and, along with the confederate, increased intake by 27% in the heavy condition (347 ml). Post-experimental questioning on the following day revealed that Subject B did not believe the confederate was a peer until he saw him drinking in the heavy consumption condition. From that point on, Subject B responded to the modeling conditions.

Inspection of Subject C's data reveals a similar pattern to that of Subject A, who revealed the same ordering of modeling conditions. An initial intake of 592 ml was reduced by 53% to 278 ml as the model decreased intake. Consumption then increased 18% to 341 ml in the heavy consumption condition and declined 56% to 151 ml in the final light consumption condition.

In examining the data for all three subjects, 2,450 ml of wine were consumed in heavy conditions, compared to 1,410 in light conditions. This difference should be interpreted cautiously, since all three subjects consumed over 500 ml in the first session, which was a heavy modeling condition 2 out of 3 times. To control for this initial heavy consumption, the data from the final 3 sessions were examined independently. All three subjects drank more in the heavy conditions than light conditions, average consumption being 50%, 34%, and 37% greater,

respectively. This result can be seen through inspection of Figure 1.

Adjectives rated. A comparison of the number of adjectives rated by subjects in the two modeling conditions revealed that 281 adjectives were rated in the heavy conditions and 284 in the light conditions. This suggests that task-orientation did not affect the observed differences in consumption between heavy and light modeling conditions.

Discussion

Differences were demonstrated in subjects' alcohol consumption between conditions of heavy vs. light consumption modeled by a trained confederate. With the exception of the initial sessions for Subject B, consumption increased or decreased in the same direction as that of the confederate. In the case of Subject B, it appears that his perceptions of the confederate may have been critical to the modeling effect; once the confederate demonstrated heavy drinking ability, Subject B responded dramatically to the modeling conditions. This interpretation is consistent with previous findings in the modeling literature (Marlatt & Perry, 1974) which suggest that a similar model is more often imitated than a model who is perceived as dissimilar. Studies on modeling have also shown that the prestige of the model is an important factor in determining the potency of the model's influence. In this regard, Subject B mentioned during his post-experimental interview that he did not respect the confederate model until he saw his partner could drink heavily. It could be argued that respect is an important component of prestige.

As an alternative explanation for Subject B's initial heavy drinking, previous studies have shown that subjects consume more alcohol in the beginning of tasting tasks before they begin to rely on memory to make taste comparisons (see Caudill & Marlatt, 1975). Because the results of the initial drinking session may have been influenced by this artifact, the final three sessions may be a more accurate representation of the modeling effect. As noted, there were

strong consumption differences between modeling conditions in these three sessions.

Interpretation of the amounts consumed in this study ($X = 180$ ml in heavy, 136 ml in light modeling) is difficult, since little comparable tasting task data exist. Previous studies have used different time periods and conditions than those reported here. Among the most similar studies, Caudill and Marlatt (1975) reported that social drinkers consumed 300 to 400 ml in 15-min heavy drinking periods and 100 to 200 ml in 15-min light consumption conditions. Higgins and Marlatt (1973) reported that alcoholics consumed almost three times as much alcohol in the tasting task than did social drinkers. Taken together, these studies suggest that the alcoholics in the current experiment were not consuming atypically large amounts. In fact, consumption during light modeling conditions approached that of Caudill and Marlatt's (1975) social drinkers. Future research should examine how closely alcoholics approach and maintain a pattern of social drinking when matched with a light consumption model.

EXPERIMENT 2

Procedure

Subjects were served lunch after Experiment 1 and relaxed in their rooms until blood alcohol levels approached zero, at approximately 8:00 p.m. Each subject was asked to select his favorite wine from Experiment 1 to determine which he would drink in Experiment 2.

Bar setting task. Subjects were matched with the same confederates as in the morning session. The pair was seated at a naturalistic bar, located in the laboratory (see Nathan et al., 1972), at which the subjects had been drinking for two previous weeks in the aforementioned blood alcohol level discrimination study. The interior of the bar contained a cooler for the beverages and a stopwatch. A bartender sat behind the bar.

The following instructions were read:

Each of you has chosen one of four brands of one type of wine. After you have been at

the bar for approximately 1 hour, I will ask each of you to determine which of the four brands of, say, burgundy, you were just drinking. Consume as much or as little as is necessary to make this discrimination. Feel free to talk and get acquainted.

The bartender filled both the subject and confederate's glasses one half full to begin the session. Thereafter, the glasses were filled as soon as all fluid had been consumed, unless one-half glass was specifically requested.

A 1-hr period was videotaped through a non-obtrusive video camera. Observers rated the total amount consumed by the subject and confederate to the nearest one-eighth glass in each of four 15-min blocks. Following the four sessions, the subject and confederate were asked to select the wine they had just been drinking from a group of four different types of the same color wine. Once these post-session ratings were completed, the next subject-confederate pair performed the procedure.

Confederates' procedure. As in Experiment 1, confederates alternated heavy and light consumption in 15-min blocks. The matching of confederate and subject and ordering of heavy and light conditions was the same as in Study 1. Confederates gauged their drinking through the following procedures. Every 5 min, the bartender would pick up a pencil located on or below the bar and return it to the same place. At 15-min points, the bartender would move the pencil from on top of to below the bar, or vice versa. In heavy consumption conditions, the confederate would drink three glasses of wine (810 ml). In the light condition, only one-half glass was consumed (135 ml). Confederates selected either the white or rosé wine mixture, neither of which contained alcohol.

Dependent Measures

The total consumption of subjects and confederates was recorded in each session.

Post Experimental Interview

Subjects were interviewed on the morning after the two studies to determine the effective-

ness of the deceptions employed. Subjects were also given a final opportunity to withdraw consent to have their data used.

Results

Confederates' consumption data. As in Experiment 1, confederates modified total consumption as per instructions. The two observers agreed 100% of the time that confederates consumed three glasses of fluid (810 ml) in heavy conditions and one-half glass (135 ml) in light conditions.

Subjects' consumption data. Observers' ratings of total consumption by each subject in each session were compared by dividing the smaller estimate by the larger estimate and multiplying by 100. The mean of these percentages was 97%, indicating high interrater reliability.

The data for Subjects A, B, and C are depicted in Figure 2. Inspection of this figure reveals that Subject A modified consumption with the confederate throughout the study. An initial intake of 540 ml in the heavy condition decreased 25% to 405 ml. in the light condition. This level increased 18% to 506 ml in the next heavy condition and fell 47% to 270 ml in the final light consumption condition.

The results for Subject B differ from those in Experiment 1, in that Subject B modified drinking with the model throughout all four sessions.

FIGURE 2. Total wine consumed (ml) by each subject in heavy (H) and light (L) consumption modeling conditions, in the semi-naturalistic bar setting.

In the initial light condition, Subject B consumed 203 ml. This level increased 25% to 270 ml in the heavy condition and decreased 25% to 203 ml in the light condition. In the final heavy modeling condition, Subject B increased consumption 33% to 304 ml.

Finally, Subject C drank 405 ml in the first heavy consumption condition, followed by a 50% drop to 203 ml in the light condition. The following heavy condition resulted in a 45% increase to 371 ml. Subject C reduced intake 19% in the final light condition (304 ml). In sum, Subject C's consumption levels changed with the model throughout the experiment.

Across all three subjects, a dramatic difference can be seen between heavy and light consumption conditions. Overall, subjects drank 2,396 ml in the heavy vs. 1,587 ml in the light consumption conditions.

Post-experimental interview. None of the subjects expressed any knowledge of deception or suspicion about the unobtrusive measures of amounts consumed; all considered the studies to be on taste discrimination. Subjects were surprised that they had been videotaped at the bar but did not withdraw permission to score and report the data.

Discussion

The results of Experiment 2 were similar to Experiment 1: In a semi-naturalistic bar setting, alcoholics' consumption increased and decreased as a function of the confederate model. Unlike Experiment 1, Subject B modeled Confederate B's consumption rates in all sessions. This supports the hypothesis that Subject B needed to see Confederate B drink heavily before modeling would be effective. Once this was demonstrated in Experiment 1, Subject B responded to all subsequent modeling conditions.

GENERAL DISCUSSION

These two experiments demonstrated that the alcohol consumption of alcoholics can be increased or decreased by modeling influences, both in laboratory analogue and semi-naturalis-

tic bar settings. Across both experiments, subjects responded with predicted directional changes in consumption in all but one modeling condition. The use of two experiments to demonstrate modeling effects reflects our concern with validating laboratory analogue procedures. In this regard, Steinglass (1975) noted that laboratory analogues are valuable only if they replicate real life behavior and provide novel or relevant information about the behavior in question. Using these criteria, the taste-rating analogue procedure was partially validated as an unobtrusive measure of alcoholics' alcohol consumption by the results of Experiment 2. This validation would be stronger if Experiment 2 had been performed in a completely natural setting, a difficult undertaking given the practical and ethical issues involved. It can be argued, however, that the setting in Experiment 2 was more natural to the subjects than a typical experimental bar, because they had been living in the laboratory and drinking at this bar for the two previous weeks. During this time, subjects reached equivalent blood alcohol levels (BAL) on drinking days as a function of their prior participation in a BAL discrimination study. Therefore, there were no differences in alcoholics' recent drinking patterns that would have differentially influenced their performance in the modeling studies. Also, the alcoholics were not exposed to discussions regarding attaining a goal of abstinence or controlled drinking; the BAL research was introduced to the men only as an experimental investigation of their discrimination abilities not as a therapeutic technique. In the BAL study, the alcoholics were given bonus money for accuracy in estimating BAL's. Whether these men were more or less influenceable by the models because of this prior training will require future research. In any case, the duplication of these results in two different, albeit not completely natural, settings is strong evidence of modeling influence. This evidence has important implications for the study and treatment of alcoholism.

The first implication is that the "loss of con-

trol" hypothesis may not be totally adequate to explain alcoholics' consumption rates. In these studies, large reductions in consumption were recorded after the first drink, contrary to Jellinek's (1960) hypothesis, and after substantial BAL's had been achieved, contrary to the hypothesis of Keller (1972). In regard to Keller's hypothesis, the two subjects who received light consumption modeling in the final phase of both studies reduced consumption an average of 45% from the previous phase, despite BAL's approaching .10%. This BAL was estimated from readings taken 20 min after each study, which ranged from .14% to .20%. It is not clear how "loss of control" could explain this consumption reduction.

Another implication of these experiments relates to the impact of consumption modeling on the maintenance of alcoholics' drinking. In the current studies, post-experimental questioning revealed that subjects were aware of and responded to social pressure to drink at the bar. More specifically, all three subjects remembered, and could be observed, gulping drinks so that they could order a refill at the same time as the confederate. They also reported that they felt less like drinking when the confederate moderated his consumption level. An alcoholic who associates with other heavy drinkers and renews those acquaintances after a course of treatment is certain to encounter heavy consumption modeling and may be at risk to continue heavy drinking. This pattern has been documented by Marlatt (Note 1) who noted that peer pressure to drink is a significant cause of treatment relapse, regardless of whether the treatment goal is abstinence or controlled drinking. In a similar vein, Lazarus (1965) has stressed the importance of the peer group in maintaining alcoholic drinking. Lazarus noted that the alcoholic is often dependent on a peer group for acceptance and relief from boredom or loneliness. Through this dependence, group drinking becomes a primary means of social escape, in which both the group and the alcohol are important interacting components.

In view of this relationship, interventions into the alcoholic's social environment seem critical to therapy outcome and maintenance. These social interventions need not be restricted to eliminating heavy consumption models; the introduction of positive models into the alcoholic's environment could also have a beneficial effect. The members of self-help groups such as Alcoholics Anonymous have provided abstinent models for alcoholics in quest of this goal. Similarly, it is possible that peer modeling influence could be used to help an alcoholic moderate consumption. The present studies provided preliminary evidence that alcoholics can reduce consumption rates in the presence of similar situational pressures which normally encourage them to drink heavily. In brief, alcoholics in these studies felt like drinking less, and did so, when the confederate model moderated his consumption level.

As an example of peer oriented intervention, alcoholics could be placed in therapy groups for social skills training and development of continued peer involvement in the community. If abstinent models were not effective in helping the alcoholic maintain abstinence, modeling of controlled drinking might help prevent a relapse to chronic levels of alcohol consumption. For instance, when feeling in danger of a relapse to heavy drinking, the alcoholic could call a predetermined member of his peer group who would go discuss the problem and serve as a light consumption model, if necessary. If further investigation showed that paraprofessionals were needed for the supportive aspect of this meeting, the therapeutically trained paraprofessional might meet with both alcoholics and/or serve as the light consumption model himself, as Gottheil et al. (1972) have suggested. On the other hand, if peer influence is necessary for effective modeling, the other alcoholic could be matched for drinking history, socioeconomic level, marital status, or numerous other factors which may prove important.

If modeling is to be an important aspect of treatment, further research must examine the above factors, plus other variables to determine

the parameters of an effective modeling situation. For example, the current results suggest that the model must be considered a peer by the alcoholic for the modeling to have impact. The relative importance of this perception should be examined more clearly. Another perception that seems important is the alcoholic's awareness of the model's intention to influence consumption. In the current studies, subjects were not aware of the model's actual purpose. Whether the same results would have been obtained with this foreknowledge is open to question and future research.

In addition to alcoholics' cognitions about the model, cognitions regarding alcohol itself may have important influences on the effectiveness of consumption modeling. As Marlatt (1978) has noted, alcoholics who believe they cannot control their drinking are likely to resume heavy consumption after only one drink. These alcoholics might profit from a form of group therapy which includes cognitive intervention to change their expectations of loss of control in drinking, along with group inpatient drinking of moderate levels to demonstrate that loss of control does not have to occur. The supportive outpatient models for these alcoholics could be matched for prior cognitive sets regarding drinking or whatever other factors future research indicates are efficacious.

Future research studies would be improved by several methodological changes. First, future designs should extend a low consumption modeling condition to see if alcoholics will continue to moderate their consumption over longer time periods. The studies reported here examined the effect of modeling on alcoholics consumption rates over a very short period of time. In addition, subsequent studies might examine alcoholics' baseline levels of drinking in the same setting, on a separate occasion before the models are introduced. As noted, there are little control or comparison data available to evaluate the current results. Finally, the confederate at the bar might discontinue drinking alcohol and request a soft drink. In this way, the efficacy of modeling

an adaptive alternative behavior for reducing alcoholics' alcohol consumption could be examined.

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