JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1977, 10, 207-211 NUMBER 2 (SUMMER) 1977

THE EFFECT OF MODELLING ON DRINKING RATE

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Three male college seniors were asked to drink beer at their normal rate in a simulated tavern setting. Each was paired with a confederate, also a male college senior, in an ABACA single subject design. In the baseline conditions, the confederate matched the drinking rate of the subject. Baseline and all subsequent conditions were continued in 1-hr sessions until a stable drinking rate was achieved. In Condition B, the confederate drank either one third more or one third less than the subject's baseline rate. In Condition C, the direction was reversed. All three subjects closely matched the confederate's drinking rate, whether high or low. All subjects reported they were unaware of the true purpose of the study.

DESCRIPTORS: drinking rate, imitation, modelling, matching, participant observers, recording and measurement techniques, social control, college students

Drinking among college students and other young people has only recently been studied systematically (Jessor and Jessor, 1975; Maddox, 1970; Straus and Bacon, 1953), and a number of sociologic studies suggest that an important determinant of drinking rate in young people is peer example or conforming to the drinking rate modelled by companions (Rogers, 1970). Bandura (1969) pointed out that "the behavior of models often serves merely as discriminative cues for observers in facilitating the expression of previously learned responses that ordinarily are not subject to negative sanctions" (p. 196). The prevalence of drinking on college campuses suggests that this behavior is quite acceptable (Maddox, 1970). A recent survey conducted on the campus of Washington State University (Garlington and Krasnec, Note 2) found that 84.4% of 741 students surveyed reported drinking once a month or more.

Young people report that peer drinking is the most important influence on their alcohol consumption (Kimes, Smith, and Maher, Note 3). Although these social influences on drinking rate have been reported by students and other young people, and correlational data have been obtained suggesting possible effects of one or more drinking parents acting as model for a son or daughter's drinking behavior (Kimes, *et al.*, Note 3), the only published controlled research on the direct effects of modelling on drinking is a study by Caudill and Marlatt (1975). They used what was ostensibly a wine "taste-rating" task. Each subject was paired with a confederate, and they were asked to rate the taste of each of three different wines on a number of descriptive adjectives. Subjects drinking with the High-Consumption model drank significantly more wine than subjects in either the Low-Consumption Condition or the No-Model Condition, the latter conditions not being significantly different. The subjects did not actually match the models' consumption, the High-Consumption group averaging only a little more than half of the models' consumption and the Low-Consumption group averaging almost twice as much as the models. However, modelling clearly had an effect on consumption.

[1]Special thanks are due Michael Laederich, Gary Larson, and Michael Miller who served as confederates and to P. Pamela Lucido and Maria Krasnec who served as participant observers. This research was supported by WSU Grant in Aid 13B 3905 0545, from the Graduate school. Reprints may be obtained from Warren K. Garlington, Psychology Department, Washington State University, Pullman, Washington 99163.

The Caudill and Marlatt (1975) study used a group design in which subjects spent one session in the taste-rating situation, in a laboratory environment. The present study, using a single subject design, dealt with the effects of modelling over a number of drinking sessions and investigated the effect of both high- and low-consumption modelling on the same subject. Sessions took place in a simulated tavern. Subjects were told they were participating in a study of normal drinking patterns. It was hoped in this manner to approximate the natural environment and the subjects' characteristic drinking patterns over time, making it possible to examine the effect of modelled drinking rate in a more "real life" situation.

METHOD

Subjects

Three volunteer male college seniors, 23- to 26-yr old, were classified as moderate drinkers based on a quantity-frequency self report indicating they drank at least the equivalent of six ounces of pure alcohol per week, with a range of 6.75 to 18 ounces.[2]

Subjects agreed in writing to serve in a study of normal drinking patterns, which would involve drinking beer. The actual objectives of the study were explained to the subjects after the study was completed. Before the debriefing, subjects were asked to state their beliefs as to the purpose of the study. All said that they believed it to be a study of normal drinking, as expressed in the original instructions.

Confederate Models

Three male college seniors served as confederates and one confederate was assigned to each subject. The confederate was introduced to the subject as another student participating in the study of normal drinking. Before beginning the study, the confederate received training in matching his drinking rate to that of another drinker and in drinking at a pre-arranged rate. Training was carried out in sessions in which the confederate practised drinking the same amounts of beer in each 5-min time interval, as the practice subject drank. The confederate also practised drinking at specified rates, in ounces per 5-min blocks. Confederates, bartenders, and observers were instructed to refrain from discussing drinking behavior during sessions. No other instructions were given pertaining to social interaction. The performance of the confederates was checked by one of the authors. All were accurate within 0.5 ounce per 5-min block by the end of training.

Environmental Setting and Apparatus

Experimental sessions were conducted in a 1.8 by 3.6 m experimental room that resembled a tavern, containing a 1.5 by 1.35 m bar, three bar stools, two tables, and a couch. Bottles of beer were stored in a refrigerator behind the bar. Twelve-ounce beer glasses were calibrated decoratively at each two-ounce interval. A Meylan clock, model J4661-60M, was used to time 5-min intervals within sessions.

Design

An ABACA reversal design was employed in which each subject served as his own control. Subjects (and confederates) were instructed to drink at their usual rate for each 1-hr session. The confederate matched his drinking rate to the subject's in Baseline 1 condition. In the first intervention, two of the three confederates then modelled a fast rate by increasing their drinking rate to one third more than the subject's Baseline 1 rate. The third confederate modelled a rate one third less than the subject's Baseline 1 rate. The second intervention reversed these conditions, *i.e.*, two confederates modelled the slow rate and the third, the fast rate. Interventions were interspersed with return to baseline and the study concluded with a return to baseline. Sessions were continued in each condition

[2]The 18-ounce-per-week subject reported, on further questioning, that this represented the amount consumed during the past month when he attended an unusual number of parties. Although higher than his usual drinking rate, the figure was retained, since the data for the other subjects also were based on the past month.

until stability (defined as a change no greater than +/− 0.10 ounces of beer per minute for three consecutive sessions) was reached.

Participant Observers and Reliability

Two trained graduate assistants, each participating in 25% of the sessions, recorded the subjects' drinking rate along with the bartender, providing reliability data for 50% of the sessions. The observers were present on a variable schedule. They made no effort to conceal that they were recording. The instructions to subjects indicated that this was a study of normal drinking patterns, so recording was to be expected. There was no systematic change in rate during sessions where an observer was present. Both observers and bartender recorded total ounces of beer, rounded off to the nearest ounce, consumed in each 5-min period by both subjects and confederates. The observer sat on a couch at one side of the bar. During the sessions, the participant observers became part of the social interaction, talking with the subjects and confederates, but not drinking. Participation was in terms of social interaction.

Reliability was calculated by dividing the number of 5-min blocks in which agreement was reached by the number of agreements plus disagreements. Mean observer reliability was 96%. Reliability between the bartender and Observer 1 ranged from 88 to 96%, with an average of 92%, and with Observer 2, it was perfect (100%) over three subjects. During the 50% of the sessions in which reliability checks were taken, there were no 5-min blocks in which zero drinking occurred. During nonreliability sessions, there were five instances of zero consumption during a 5-min block. The bartender recorded the confederate's rate as well as the subject's rate; however, reliability was not obtained on confederate's drinking rate.

Results and Discussion

Figure 1 presents rates of beer consumption for both subjects and confederates during all conditions. The last three sessions in each condition represent stability. Rate was calculated by dividing the number of ounces of beer consumed in sessions by 60 min, the total session time. Clearly, consumption was influenced by the drinking rate of the confederate.

Increases and decreases in subject consumption rates matched closely the modelled rates, with the single exception of Subject 1 during the fast rate, where he increased his rate to a point about 0.2 ounces per minute over the confederate's rate. Baseline matching was virtually identical, of course, because the design called for the confederate to match the subject during these conditions. Sessions required to reach stability decreased over conditions, suggesting an increasing influence of the confederates over the subject's drinking rate.

Modelled drinking rates dramatically influenced the subjects' rates of beer consumption. Subjects tended to match the confederates' rate, rather than generally increasing or decreasing their rates as a function of the modelled condition. The notion that drinking rates may be socially influenced is supported.

Modelling is not instantaneous. Sessions required to reach the first criterion point varied from four to nine during the first experimental condition, and from two to three for the second. Baseline stability also was achieved more rapidly for each succeeding baseline. Sessions to first criterion point varied from two to six for Baseline 1, one to four for Baseline 2, and was achieved in only one session for Baseline 3 for all subjects. A potential source of confounding does occur in the repeated-sessions design. It is conceivable that confederates responded differentially to subjects in the various phases of the study, and thus influenced rate independently of modelling effects.

The demonstration of model effects seen in this study and the Caudill and Marlatt (1975) study is only a first step in investigating the social influence of a model on a drinking companion. The repeated-measurements design used in the present study allowed the full effects of the modelling process to appear.

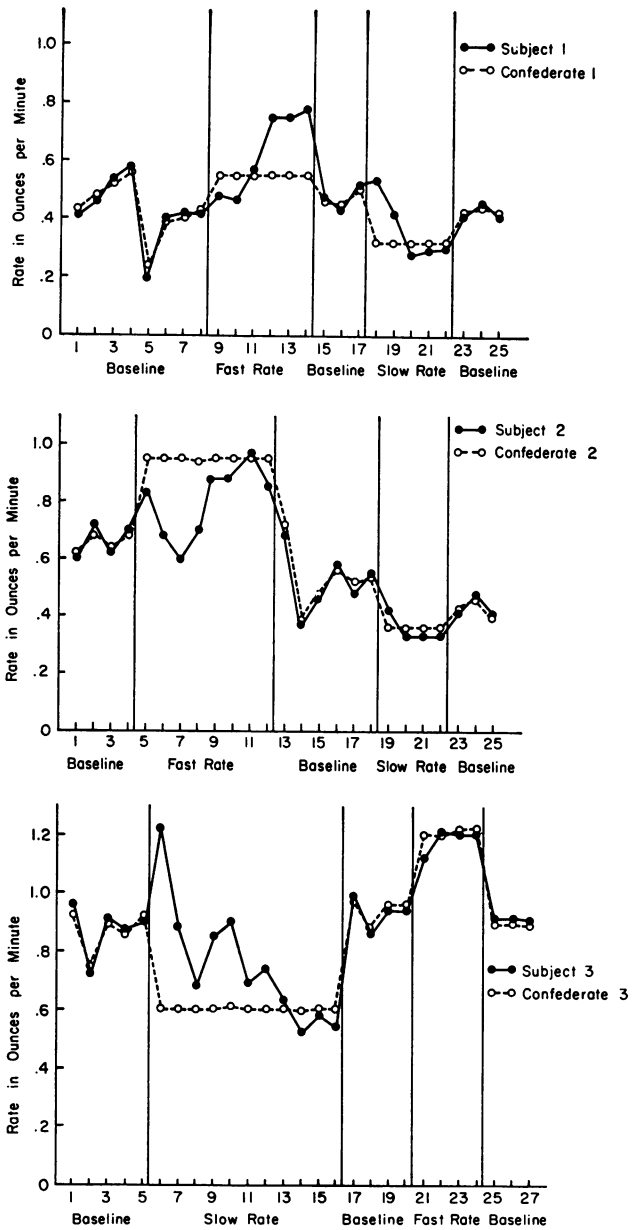

Fig. 1. Drinking rate of subjects and confederates for all baseline and experimental conditions.

A number of variables need to be investigated to provide enough information to allow the use of modelling procedures to assist drinkers to control their alcohol intake. These include initial drinking rate, *i.e.,* heavy drinkers compared to moderate drinkers, characteristics of the model (Bandura, 1969; Lippett, Polansky, and Rosen, 1952), number of models, and sex of models. Alcoholic beverages other than beer also should be studied.

Another condition, which has practical implications, both ethically and for training drinkers in self control, is the instruction or explanation presented to the subject. In this study and in Caudill and Marlatt (1975), subjects were misinformed as to the purpose of the research. A

pertinent question is to what extent the model will influence behavior if the subject is informed that such influence is the purpose of the study? If such disclosure reduces modelling effects, it might be useful in treating problem drinkers; if it does not, it would allow a straightforward explanation to the subject without the need for subterfuge. Other clinical implications are suggested by the present results. For example, "real life" models might be trained to drink at a prescribed low rate and allowed to influence the rate of their social groups.

Modelling does seem to offer some possibilities in decreasing drinking rates, but the research programs necessary to develop practical applications are barely under way.

REFERENCE NOTES

1. Albrecht, G. L. *The assessment of Fulton County adolescents behavior, knowledge, and attitudes in relation to the legal system: A preliminary report.* Mimeographed. Cited in Albrecht, G. L., The alcoholism process: A social learning viewpoint, in P. G. Bourne and R. Fox, (Eds), *Alcoholism: progress in research and treatment.* New York: Academic Press, 1973. Pp. 11-42.
2. Garlington, W. K. and Krasnec, M. *A Survey of drinking practices of college students.* In progress.
3. Kimes, W. T., Smith, S. C., and Maher, R. E. *Alcohol and drug abuse in South Carolina.* Department of Education, Columbia, South Carolina, cited in Albrecht, G. L., The alcoholism process: A social learning viewpoint, in P. G. Bourne and R. Fox, (Eds), *Alcoholism: Progress in research and treatment.* New York: Academic Press, 1973. Pp. 11-42.

REFERENCES

Bandura, A. *Principles of behavior modification.* New York: Holt, Rinehart & Winston, 1969.

Caudill, B. D. and Marlatt, G. A. Modeling influences in social drinking: an experimental analogue. *Journal of Consulting and Clinical Psychology,* 1975, **43,** 405-415.

Jessor, R. and Jessor, S. L. Adolescent development and the onset of drinking: a longitudinal study. *Journal of Studies on Alcohol,* 1975, **36,** 27-51.

Lippett, R., Polansky, N., and Rosen, S. The dynamics of power. *Human Relations,* 1952, **5,** 37-64.

Maddox, G. L. (Ed), *The domesticated drug: drinking among collegians.* New Haven: College and University Press, 1970.

Rogers, E. M. Group influences on student drinking behavior. In G. L. Maddox (Ed), *The domesticated drug: drinking among collegians.* New Haven: College and University Press, 1970. Pp. 307-320.

Schaefer, H. H., Sobell, M. B., and Mills, K. C. Baseline drinking behaviors in alcoholics and social drinkers; kinds of drinks and sip magnitudes, *Behaviour Research and Therapy,* 1971, **9,** 23-27.

Straus, R. and Bacon, S. D. *Drinking in college.* New Haven: Yale University Press, 1953.

United States Department of Health, Education and Welfare *Second special report to the U.S. Congress on alcohol & health: New knowledge.* Washington, D.C.: U.S. Government Printing Office, 1974.

Received 27 January 1976.
(Final acceptance 17 September 1976.)