

Dissonance and Alcohol: Drinking Your Troubles Away

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Based on recent evidence supporting the assumption that cognitive dissonance is experienced as an unpleasant emotional state, and further evidence pertaining to the effects of drinking alcohol, it was predicted that among social drinkers, dissonance arousal would increase the amount of drinking and that drinking, in turn, would reduce dissonance and subsequent attitude change. This hypothesis was tested in the first two experiments by having subjects taste rate different brands of an alcoholic beverage—ostensibly to test taste discrimination but in fact to measure the amount of drinking—immediately after dissonance was aroused by having them write a counterattitudinal essay. The effect of drinking on dissonance reduction was assessed by measuring subjects' postattitudes immediately after the drinking task. Both experiments found that although dissonance arousal had little effect on the amount of drinking, whatever drinking occurred was sufficient to eliminate dissonance-reducing attitude change. The second experiment further established that these results occurred for light as well as heavy social drinkers. Evidence that the dissonance-reducing effect of drinking resulted from some effect of drinking alcohol was provided by the finding, in the second and third experiments, that neither water nor coffee drinking was sufficient to eliminate attitude change in this paradigm. Both the practical and theoretical implications are discussed. The practical implication is that some forms of alcohol abuse may evolve through the reinforcement of drinking as a means of reducing dissonance; the theoretical implication is that dissonance may be frequently reduced through behaviors that ameliorate the feelings of dissonance without involving cognitive change.

Cognitive dissonance theory reasons that behavior that contradicts an important belief about oneself will arouse dissonance, an uncomfortable state of psychological tension (Aronson, 1969; Zanna & Cooper, 1976). When this happens, attitude change may occur in order to restore consistency between one's self-image and one's behavior, thereby reducing dissonance. Following this reason-

ing, dissonance reduction has typically been measured by changes in attitudes and behavior that are capable of reconciling the inconsistent cognitions. Despite the logic of this approach, it may have obscured the possibility that dissonance reduction may sometimes involve other responses that have no relationship to the inconsistent cognitions. Because it is an uncomfortable state of tension, dissonance may motivate behavior that is capable of alleviating the discomfort of dissonance, even when such behavior does not remedy the particular stimulus inconsistency.

Several recent experiments by Kidd and Berkowitz (1976), for example, showed that dissonance aroused by having subjects write a counterattitudinal essay increased subjects' helping behavior. Even though helping was unrelated to the dissonance-causing inconsistency, its ability to enhance subjects'

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self-esteem, and presumably make them feel better, may have made it a more likely response to dissonance. Similarly, Steele (1975) has suggested that dissonance arousal might also motivate behaviors such as drinking, smoking, or drug use that neither reduce inconsistency nor enhance self-esteem but simply elevate one's mood or reduce inhibitions. Thus, the first question addressed by the present research is whether dissonance can motivate a response that does not reconcile the provoking inconsistency yet is capable of alleviating its unpleasantness.

To address this question, the present research examines the possibility of a relationship between dissonance and drinking. Several known effects of drinking alcohol suggest that it might be a particularly effective way of eliminating the unpleasant feelings of dissonance. First, evidence on the "biphasic" physiological effects of alcohol (Himwich & Callison, 1972; McCollam, Burish, Maisto, & Sobell, 1980; Mello, 1968) indicates that during the initial phases of ingestion, small amounts of alcohol stimulate the central nervous system and cause positive affect. In describing their early reactions to drinking, subjects report feeling "alert and pepped up" and as having more energy (Naitoh & Docter, 1968). In larger amounts and during later phases of the drinking episode, alcohol acts as a depressant. Also, recent evidence indicates that this pattern of physiological effects is reflected in subjects' *expectations* about the effects of drinking. Two recent independent surveys (Brown, Goldman, Inn, & Anderson, 1980; Southwick, Steele, & Marlatt, 1981) revealed that during the initial phases of drinking, college drinkers expected alcohol to make them feel mildly euphoric, less inhibited, less self-conscious, and so forth. Negative effects such as poor coordination, hostility, and so forth, were expected to occur later in the drinking episode. Thus, regardless of how it is mediated, moderate drinking might relieve dissonance through its ability to induce positive affect.

Drinking may also relieve dissonance through its effect as a disinhibitory agent. Cognitive dissonance can be conceptualized as an internalized pressure toward psychological consistency and away from inconsis-

tency. In this regard, alcohol has been found to reduce the pressure of internalized constraints against a variety of behaviors: aggression (e.g., Boyatzis, 1974; Shuntich & Taylor, 1972; Taylor & Gammon, 1975; Ziechner & Pihl, 1979), violent crime (Wolfgang, 1958), self-restrained eating behavior (Polivy & Herman, 1976a, 1976b), self-disclosure (Rohrberg & Sousa-Poza, 1976), gambling (Hurst, Radlow, Chubb, & Bagley, 1969), and risk taking (Teger, Katkin, & Pruitt, 1969). MacAndrew and Edgerton (1969) further argue that based on our general cultural expectations about the effects of alcohol, drinking is frequently used as an acceptable "time out" from the normative (internalized as well as externally imposed) regulation of behavior. Thus, whether mediated physiologically or cognitively, drinking may relieve the unpleasantness of dissonance through a disinhibitory effect of freeing the individual from the internalized pressure to maintain psychological consistency.

Finally, a possible dissonance-relieving effect of drinking is suggested by the conventional hypothesis that alcohol has tension-reducing properties (Conger, 1956). This hypothesis has been tested for many types of tension, but the findings have been inconsistent (cf. Cappell & Herman, 1972; Higgins, 1976). Nonetheless, one reason for the variability in support of the hypothesis may be that drinking reduces some forms of tension and not others. Thus, drinking may possibly reduce the discomfort of dissonance through a direct tension-reduction effect, which could be mediated either physiologically or cognitively.

If any one or all of these effects of drinking can reduce the unpleasant feelings of dissonance, then dissonance arousal might be expected to cause regular drinkers, especially, to increase their drinking as an expedient means of relieving these feelings.

Equally important is whether drinking, by relieving these feelings, will interfere with cognitive efforts to restore consistency. Several recent findings suggest that it might. The results of experiments by Cooper and Zanna and their associates (e.g., Cooper, Zanna, & Taves, 1978; Zanna & Cooper, 1974, 1976) show that in order for consis-

tency-restoring attitude change to follow dissonance arousal, subjects must both experience negative arousal and also attribute this arousal to the dissonance-provoking act. Because drinking follows dissonance arousal by some time in the present research, it is unlikely that it would eliminate dissonance-reducing attitude change by causing subjects to misattribute their dissonant feelings to the act of drinking. Cooper et al. (1978), however, found that the normal tendency toward dissonance-reducing attitude change could also be eliminated by covertly giving subjects enough tranquilizer (phenobarbital) to directly alleviate the negative arousal associated with dissonance. Thus, if drinking alcohol, through any of the means described above, eliminates the unpleasantness of dissonance, it could also be expected to eliminate dissonance-reducing attitude change.

Study 1

The purpose of this experiment was to test the hypothesis that dissonance arousal would increase drinking and that drinking, in turn, would eliminate dissonance-reducing attitude change. To do this, subjects who were social drinkers were induced to write, under conditions of free choice, an essay either favoring or opposing an increase in tuition. Following a design developed by Cooper, Fazio, and Rhodewalt (1978), half of the subjects were then presented with a measure of their attitudes toward the increase. The administration of the attitude measure at this point enabled a test of the standard effect of dissonance on attitude change in this experiment; subjects in the dissonance condition should show consistency-restoring attitude change on this measure, whereas subjects in the consonant condition should not. Following the attitude measure, these subjects participated in a beer-tasting task ostensibly to assess their ability to discriminate among types of beer. If dissonance motivates drinking, these subjects should drink relatively little, since dissonance was either not aroused (as for the consonant subjects) or was reduced by prior attitude change (for the dissonance subjects). For the other half of the subjects, the drinking measure preceded the attitude measure. If dissonance

motivates drinking, drinking should be relatively high for the dissonance subjects in this condition. If drinking, in turn, reduces the motivation to restore consistency, dissonance subjects should show relatively little attitude change in this condition.¹ These conditions lead to the prediction of an order of measurement by type of measure interaction in the dissonance condition. Thus the levels of drinking and attitude change depend on whether they were measured first or second.

Subjects' drinking habits might also affect their reaction to the variables in this experiment. Heavier social drinkers could have more experience and familiarity with the use of alcohol as a means of disinhibition and pleasure enhancement than moderate social drinkers. This, in turn, could make them more likely to drink in response to dissonance arousal. To examine this possibility, subjects' drinking habits were included as a factor in the present design.

Method

Subjects

An advertisement in the student newspaper was used to recruit subjects for a beer-tasting experiment who were (a) 21 years of age or older, (b) University of Washington students, and (c) experienced with alcohol. The ad offered \$5 for participation and provided a num-

¹ It will be noted that this drinking manipulation tests the effect of drinking, but not alcohol per se on dissonance reduction. A test of the effect of alcohol requires an administration procedure in which subjects are brought to the same intoxicating blood alcohol level at the time of the attitude measure without their being aware that they had consumed alcohol. Cooper, Zanna, and Taves (1978) used such a procedure to administer phenobarbital and amphetamine in their test of the role of arousal in mediating dissonance. In contrast, the drinking task in the present experiment allowed subjects to regulate their own dosage level, and the attitude measure was taken relatively soon (10 min. and 15 min.) after the task began. This task, it is reasoned, is sufficient to foster the specific effects of drinking that are hypothesized to reduce dissonance. Mediated by subjects' expectancies about the effects of drinking and physiological effects resulting from the amount of alcohol that subjects do consume, it is assumed that freely drinking alcohol in this task is mood-enhancing and disinhibiting in a way that the standard blood alcohol level procedure would not be and that it is thus generalizable to the effects of real life social drinking. Nonetheless, because this task allows subjects' blood alcohol levels to vary, this research cannot be viewed as a test of the effect of alcohol per se on dissonance.

ber to call. Students who called were then screened for participation on the basis of their self-reported drinking habits. Using the definition that one drink equals one can of beer, one glass of wine, or one cocktail, only students who reported seven or more drinks per week were eligible for participation. These subjects were then divided into two groups, depending on whether they averaged between 7 and 10 or 10 and more drinks per week. Use of these selection and grouping criteria created groups whose drinking habits approximated what Cahalan, Cisin, and Crossley (1969) considered to be "moderate" and "heavy" levels of social drinking, respectively, based on their survey of national drinking practices. The selected subjects were then telephoned to schedule their appointments and were told not to eat for a period of 4 hrs. prior to their arrival time. In response to a question on the postexperimental questionnaire, subjects indicated that they had endured, on the average, 4.4 hrs. of food deprivation prior to the experiment. In this way, 64 subjects (47 males and 17 females) were recruited for this experiment, (32 moderate and 32 heavy social drinkers). The average number of drinks per week reported by the moderate drinkers was 8.3 and 15.1 for the heavy drinkers.²

Upon arrival subjects were randomly assigned to conditions, with the restrictions that an equal number of moderate and heavy drinkers and an equal proportion of males and females be assigned to each of the four experimental conditions (dissonance-attitude measure first, dissonance-drinking measure first, consonance-attitude measure first, and consonance-drinking measure first) and a base-rate control condition in which subjects did not write an essay but did complete the attitude measure followed by the drinking measure. Over the course of the experiment, nine subjects (five in the dissonance conditions and four in the consonance conditions) had to be replaced because they refused to write the essay. Two subjects were signed up for each experimental session, with each one assigned to separate rooms. All experimental sessions were conducted between the hours of 3:00 p.m. and 6:00 p.m. because subjects are generally less willing to drink earlier in the day.

Procedure

The experimenter began the session by stating that the purpose of this study was to examine the relationship between biographical, attitude, and life-style factors and sensory discrimination, in particular, alcohol taste discrimination. It was explained that recent research had shown that people's personal characteristics, such as background and sociopolitical attitudes, affected their level of tactile and auditory discrimination. Examples were provided of how people made finer discriminations among the voice inflections of speakers with whom they agreed than of those with whom they disagreed, and that people from dense urban environments were better at making auditory discriminations against loud background noise, and so on. Subjects were then told that the experiment consisted of three parts: a Biographical, Attitude and Life-Style Survey; an Attitude-Activation Task (argument listing), which was ostensibly included

to get subjects to recall and make salient their values and attitudes prior to the discrimination task; and a Beer Taste Discrimination Task. At this point subjects began work on the biographical-attitude questionnaire. This questionnaire was divided into three sections: the first asked for biographical and background information (e.g., number of siblings, region of country where born), the second was a 20-item survey of sociopolitical attitudes, and the third included 12 items that asked subjects about their current life-style (e.g., number of movies seen per month). Included in the sociopolitical section of the questionnaire was a pretest measure of subjects' attitudes, which asked them to indicate on a 20-point scale the degree of their agreement or disagreement with the statement, "Students at public universities should pay substantially more tuition than they currently pay." All experimenters were kept blind to the hypotheses and were required to conduct each condition an equal number of times.

Dissonance manipulation. After completing the survey, subjects were introduced to the Attitude Activation Task. It was explained that the purpose of this task was to fully activate subjects' attitudes and values so that they would have maximum impact on their discrimination performance. The example was provided of how one's attitudes and beliefs become more prominent and clear during the course of an argument or debate. In this regard, it was explained that the activation task would involve participation in a real survey being conducted by the Faculty and Student Council on University Affairs. It was stated that the Council was preparing an orientation program for students entering the university during the subsequent fall quarter, which included the issue of a large increase in tuition at the University of Washington. In the interest of fully understanding the relevant arguments on both sides of the issue, the Council wanted students to list arguments favoring only one side. In the dissonance conditions, subjects were told that since the Council had already received so many arguments opposing an increase, it was now seeking arguments favoring the increase. Subjects were then told to take the next 10 min. and list the strongest, most forceful arguments supporting a substantial increase in tuition at the University of Washington. In the consonance conditions, subjects were told that the Council was still seeking arguments that opposed a tuition increase, and in the 10 min. allotted, the Council would like them to list the strongest, most forceful arguments that supported this position.

At this point, following a procedure developed by Cooper et al. (1978), subjects were handed a large manila envelope addressed to the Faculty and Student Council on University Affairs, which contained the materials for writing the arguments. To help keep this

² It should be noted that potential subjects who called in were highly motivated to participate in this experiment. Because the newspaper ad specified that "experience with alcohol" was a requirement for participation, these self-reports of number of drinks per week may be somewhat inflated. Thus, our division between moderate and heavy social drinkers must be considered an approximate use of the Cahalan et al. criteria.

argument-listing task separate from the rest of the experiment, subjects were told to place their arguments in the envelope when they finished so that they could be sent directly to the committee. To create the perception that subjects had chosen to write the arguments—a necessary part of dissonance arousal—and to reinforce the public nature of their arguments, the first page in the envelope was an informed consent form that asked subjects to acknowledge (a) the nature of the task, (b) gave the Council the right to use the subject's arguments, and (c) informed the subjects that they would be paid \$5 regardless of whether they wrote the arguments. The form also requested that the subjects check their choice of whether to write the arguments and whether they agreed to release them to the Council. Finally, the form required the subjects to print their names and the date and to provide a signature. Subjects in the experimental conditions then spent the next 10 min. writing.

Order manipulation. For subjects in the attitude measure first condition, the last page of the materials in the manila envelope contained the postmeasure of subjects' attitudes toward a tuition increase. The questionnaire stated that, "In order to properly evaluate your essay, the Faculty and Student Council for University Affairs would like to know what your own opinion toward the issue is," and asked subjects to indicate, on a 31-point scale, the degree of their agreement or disagreement with the statement that "the University of Washington should raise student tuition by a substantial amount." For subjects in the drinking first condition, this measure was not included in their envelopes but was administered after they had participated in the taste-rating task (described below) by the experimenter, who claimed to have forgotten to include it in their envelopes. The posttest attitude measure differed from the pretest measure in the statement and scale that is used, and like all the materials included in the envelope, it was dittoed rather than mimeographed. These differences were included to make it more credible that the argument-listing task was separate from the other parts of the experiment.

Beer-tasting task. Either immediately after the attitude postmeasure in the attitude-measure first condition or immediately after the listing task in the drinking first condition, subjects were individually taken to separate rooms where the taste-rating task was set up. This task was adapted from a wine-tasting discrimination task used by Marlatt and his associates in several recent experiments (e.g., Higgins & Marlatt, 1975). Each subject was provided with three 16-oz. cans of cold beer of different brands (Schlitz, Budweiser, and Olympia) and three large, chilled mugs. While the subject turned away, the beers were poured into the mugs that were then labeled either *A*, *B*, or *C* and shifted around on the table so that the subject would not know which brand was in each mug. The task required subjects to discriminate among the beers by using a list of adjectives that included *sweet*, *bitter*, *malty*, *sour*, *tangy*, and so forth. The adjectives were typed on cards that were stacked upside down in a card box so that the subject could not tell how many cards were to be rated. Subjects had to rate which beer was the "most" and "least" for each

adjective, and they were not told how long the task would last. As the experimenter left the room, he told each subject, "Feel free to drink as much beer as you need in order to make your best discriminations." After 15 min. the task was stopped and the amount the subject drank was measured. Also, the number of sips subjects took throughout the task was recorded for each of the three 5-min. time periods by an observer who watched subjects through a one-way mirror. After the task, subjects' blood alcohol levels were measured with an intoxilizer to determine if the blood alcohol level of any subject had exceeded the .05 level. Although this level does not indicate intoxication, it does indicate a need for caution, and subjects who reached this level were to be driven home. No subjects in this experiment reached the .05 blood alcohol level.

Results

The number of subjects in each analysis is the number of subjects who completed all necessary measures.

Pretest Attitudes

A 2 (dissonance vs. consonance) \times 2 (order: attitude first vs. drinking first) \times 2 (drinking habits: heavy vs. moderate) analysis of variance on subjects' pretest attitudes revealed a main effect for drinking habits, $F(1, 39) = 8.81, p < .003$. As the means in Table 1 show, moderate drinkers were significantly more favorable toward an increase in tuition than were heavier drinkers, especially in the dissonance conditions. These subjects did not experience the same level of dissonance arousal as heavier social drinkers and, in fact, probably experienced very little dissonance at all, since in the dissonance conditions their attitudes were toward the midpoint of the 20-point scale, indicating little opposition to the tuition increase. The absence of successful dissonance arousal for these subjects meant that the experimental hypotheses could be adequately tested only for heavier drinkers.

Drinking and Attitude Change as Reactions to Dissonance among Heavy Drinkers

Following an analysis used by Cooper et al. (1978), postattitude scores and the total milliliters of beer consumed during the drinking task were converted to standardized scores in order to place both variables on a

Table 1
Pretest Attitudes as a Function of Condition and Drinking Habits

Condition	Drinking habits	
	Heavy	Moderate
Dissonance-attitude 1st	2.5	9.0
Dissonance-drinking 1st	2.8	7.6
Consonance-attitude 1st	3.8	4.6
Consonance-drinking 1st	2.3	4.8
Base-rate control	7.3	6.3

Note. Twenty indicates greatest possible favorability toward a tuition hike.

common scale of measurement. The overall Order \times Measure interaction was significant for heavy drinkers, $F(1, 18) = 5.50, p < .03$. Tests of this interaction within the dissonance and consonance conditions separately revealed that as predicted, this interaction was significant in the dissonance conditions, $F(1, 18) = 8.16, p < .01$, but not in the consonance conditions. As can be seen in Figure 1, heavy drinkers in the dissonance conditions either favored the tuition hike relatively more and then drank relatively less in the attitude-measure first condition, or drank relatively more and then favored the tuition hike relatively less in the drinking first condition; they countered their dissonance with whichever opportunity came first, attitude change or drinking. In the consonance conditions there was no evidence of this tendency. The three-way interaction between dissonance arousal, order, and measure that reflects this pattern of results was marginally significant, $F(1, 18) = 3.5, p < .08$.

Effect of Dissonance on the Amount of Drinking

Although the pattern of data in Figure 1 suggests that dissonance may increase drinking, to fully establish this effect, the appropriate comparisons must be made separately. If dissonance increases drinking, then heavy drinkers in the dissonance-drinking first condition should drink more beer than those subjects in either the consonant-drinking first or control conditions. Although the means are in the predicted direction (in milliliters, the dissonance-drinking first, $M =$

734, the consonant-drinking first, $M = 542.5$, and the base-rate control, $M = 701.2$), neither the separate contrasts of each no-dissonance condition against the dissonance condition nor the contrast of both no-dissonance conditions combined against the dissonance condition reached significance (all $F_s < 1$). (The same pattern of results emerged when these contrasts were made with subjects' drinking habits removed as a covariate.) These data thus provide little support for the hypothesis that dissonance directly increases the amount of drinking even among heavy drinkers. It must be noted, however, that the within-cell variability in subjects' drinking during the rating task was extremely high.

Effect of Drinking on Cognitive Efforts to Reduce Dissonance

If the self-regulated drinking that subjects engaged in during the tasting task was sufficient to eliminate dissonance-reducing attitude change, then subjects in the dissonance-drinking first condition should show no more attitude change than subjects in the control condition or consonant-drinking first condition, and significantly less attitude change than was observed in the dissonance-attitude first condition.

Before presenting these results, however, it must first be established that dissonance produced significant attitude change in this experiment. To do this, postattitudes (with subjects' pretest scores removed as a covariate because of the high variability of ini-

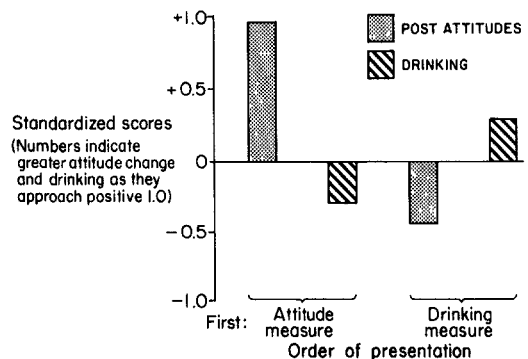


Figure 1. Postattitudes and drinking for heavy drinkers.

tial attitudes in this experiment) in the dissonance-attitude first condition were contrasted against postattitudes in the consonant-attitude first condition and the control condition, both separately and together. (The adjusted means were dissonance-attitude first, $M = 15.4$, consonant-attitude first, $M = 24.8$, base-rate control, $M = 25.2$, where 31 indicates the strongest opposition to the tuition hike and, thus, the least attitude change.) These contrasts revealed that dissonance produced significantly more attitude change than was found in the control condition, $F(1, 9) = 5.20$, $p < .05$, marginally more change than was observed in consonant-attitude first condition, $F(1, 8) = 2.71$, $p < .14$, and significantly more change than was observed in both of these conditions combined, $F(1, 15) = 6.46$, $p < .03$. Dissonance-reducing attitude change was thus successfully replicated in this experiment. Was drinking sufficient to eliminate this change? The postattitudes for subjects in the dissonance condition who drank prior to the attitude measure ($M = 27.1$) did not differ significantly from those in the consonant-drinking first and control conditions ($F_s < 1$) and, in fact, were significantly less favorable than postattitudes in the dissonance-attitude first condition, $F(1, 8) = 5.20$, $p = .051$.³

Discussion

This first experiment provides suggestive evidence of the hypothesized relationship between dissonance and drinking. For heavier social drinkers, drinking beer and attitude change served as interchangeable responses to dissonance arousal. The significant order of presentation by measure interaction for these drinkers within the dissonance conditions showed that they availed themselves of whichever response came first, beer drinking or attitude change, and that both responses were equally effective at reducing dissonance, as indicated by the reduced magnitude of these responses when they came second. Individual contrasts, however, revealed that these results provided significant support for only the second half of this hypothesis. Although drinking beer clearly eliminated dissonance-reducing attitude change, these contrasts did not reveal a significant

effect of dissonance on the amount of beer consumed. Also, the forced exclusion of moderate drinkers from the analysis makes it impossible to generalize the results beyond the behavior of heavier social drinkers. With these limitations in mind, however, the present data suggest that drinking may be an effective means of reducing dissonance.

The fact that subjects in the dissonance-drinking first condition drank prior to the measurement of their attitudes, however, raises several possible alternative explanations of the dissonance-reducing effect of drinking in that condition. One of these can be addressed by data from the present experiment. Because the attitude measure followed drinking in this condition, the lack of attitude change may have resulted from subjects simply being too drunk to attend to the measure. Several factors, however, discredit this possibility. For one thing, although it is possible that subjects consumed enough beer during the 15-min. drinking task to induce modest affect enhancement and intoxication (cf. Ekman, Frankenhaeuser, Goldberg, Hagdahl, & Myrsten, 1964; McCollam et al., 1980), it is unlikely that they were drunk enough to ignore the attitude measure or its meaning. This point is corroborated by the fact that no subject in this experiment reached the .05 blood alcohol level (a .10 blood alcohol level is the legal criterion for intoxication in most states). Also, if drinking interfered with subjects' ability to attend to the postattitude measure, it might be expected that the correlation between pre- and posttest attitudes would be lower in the drinking-first conditions, where the postattitude measures were administered after subjects drank, than in the attitude-measure first condition, where attitudes were measured prior to drinking. These correlations, however, were .63 and .72, respectively. It is thus unlikely that subjects were too drunk to attend to the attitude measure in the

³ The results for moderate drinkers were also analyzed. As would be expected from the evidence showing that the essay favoring a tuition hike was not counter-attitudinal for them, neither the order of presentation by type of measure interaction that was predicted in the dissonance conditions, nor the contrasts reflecting an effect of dissonance on drinking and an effect of drinking on dissonance, reached significance.

drinking first condition. Nonetheless, several other alternative explanations of this effect remain that cannot be addressed by evidence available from the present experiment.

1. The greater time delay between dissonance arousal and attitude measurement experienced by subjects in the drinking first condition compared to subjects in the attitude first condition may have allowed dissonance to dissipate simply as a function of time, aside from any effect of drinking. Research that has assessed the effect of time on dissonance generally shows that it is the activity that fills the time, rather than time per se, that determines the persistence of dissonance (e.g., Crano & Messé, 1970; Freedman, 1965; Higgins, Rhodewalt, & Zanna, 1979; Walster & Berscheid, 1968). Nonetheless, to definitively eliminate this alternative explanation, it is necessary to determine whether the time delay that was confounded with drinking in the drinking first condition contributed to the lack of attitude change in that condition.

2. In addition to the time factor, the taste-rating task in the dissonance-drinking first condition may have been sufficiently involving to reduce dissonance by distracting subjects' attention away from their dissonant cognitions. Prior research (e.g., Zanna & Aziza, 1976) has shown that dissonance-reducing attitude change can be eliminated by participation in an involving task that presumably diverts attention away from the dissonant cognitions.

Study 2

A condition that replicated the general procedure of the dissonance-drinking first condition of Study 1 was included in this experiment both to test the replicability of the dissonance-reducing effect of drinking observed in Study 1 and to provide a second, more sensitive test of the effect of dissonance on the amount of drinking. With respect to this last aim, all subjects were given water prior to the drinking task, and vodka drinks were used in place of beer to reduce the extent to which variations in subjects' thirst contributed to variability in alcohol consumption. Changing the type of drinks used in the drinking task also tested whether the

effects of drinking observed in Study 1 would generalize over different types of alcoholic beverages.

To test the time and distraction alternative explanations, the present experiment included another condition that exactly replicated the procedures of the dissonance-drinking first condition of Study 1 except that the taste-rating task required subjects to discriminate between types of water (tap and distilled) rather than brands of alcohol. If the dissonance-reducing effect of beer drinking in Study 1 resulted from the time and distraction involved in the rating task, then no significant attitude change should be observed in this condition.

This experiment also included a drinking-habits factor, and to prevent the exclusion of subjects because of inappropriate initial attitudes, only subjects with appropriate initial attitudes were treated as eligible for participation. The test of the drinking habits factor also involved change in strategy from Study 1: Light drinkers (people who drank no more than once a month) rather than moderate drinkers were used to constitute the lighter drinking level of the drinking habits factor. Because both moderate and heavy social drinkers selected by the Cahalan et al. (1969) norms drank relatively heavily (more than seven drinks per week), it was felt that the use of light drinkers would reveal more about the role of drinking habits in mediating the predicted effects. The inclusion of this factor led to a 2 (heavy vs. light drinking habits) \times 3 (dissonance-alcohol, dissonance-water, and base-rate control, alcohol condition) design.

Method

Subjects

Potential subjects were identified through the administration of a Biographical, Attitude and Life Style questionnaire (used as the pretest in Study 1) to psychology classes and some fraternities at the University of Washington. Embedded in this 30-item questionnaire was a question assessing respondents' attitudes toward a tuition increase on an 11-point scale and two questions regarding drinking habits, one asking respondents for an estimate of the number of drinks they consumed per week, and the other asking them to check one of four verbal descriptions of their drinking that were based on the Cahalan et al. descriptions of drinking habit categories: never drink; drink at least once a year but less

than once a month; drink at least once a month, no more than three drinks at a time; drink nearly every day or weekly, often more than five drinks at a time. Students over 21 were selected as eligible for participation if they opposed a tuition hike (a 4 or lower rating where 1 indicated strongest opposition) and either averaged more than 10 drinks per week (heavy drinkers) or drank at least once a year but less than once a month (light drinkers). Those meeting these criteria were telephoned and in most cases offered extra class credit, though some subjects were recruited from classes that did not give extra credit and were therefore asked to volunteer. Subjects were told during the phone contact that depending on the experimental condition they were assigned to, their participation could involve taste rating alcoholic drinks. The average number of drinks per week reported by the heavy drinkers was 15; by light drinkers, .7.

Upon arrival, subjects were randomly assigned to one of the three conditions—dissonance alcohol, dissonance water, base-rate alcohol control—with the restriction that an equal number of heavy and light drinkers be assigned to each group. Five subjects were dropped from the final analyses for not following directions, and an additional five females were randomly eliminated from the dissonance-alcohol condition in order to equalize the proportion of males to females in each of the six conditions, leaving a total of 10 females and 35 males in the entire experiment.

Procedure

As in Study 1, the experimenter began by explaining to all subjects that the purpose of this experiment was to examine the relationship between background attitude and life-style variables and sensory discrimination, in particular alcohol taste discrimination. Subjects assigned to the water condition were told that they would be participating in a control procedure to assess the effect of background attitudes, and so forth, on taste discrimination among nonalcoholic beverages. It was stated that their task would involve tasting different types of water. In the dissonance-alcohol and dissonance-water conditions, subjects were told that the experiment consisted of three parts: an attitude activation task, the ostensible purpose of which was to make their attitudes more salient before the task discrimination task but in fact provided the occasion for the counter-attitudinal essay; a taste discrimination task (vodka drinks or water); and a final postexperimental questionnaire. For subjects in these conditions, the procedure of this experiment followed that of the "dissonance-drinking first" condition of Study 1, with several exceptions: (a) the Biographical Attitude Survey was not included as part of the procedure of this experiment, since subjects' pretest attitudes were measured earlier by the administration of this questionnaire in psychology classes; (b) immediately after the purpose of the experiment was explained, all subjects were instructed to drink from a glass of water, ostensibly to sensitize their taste buds but actually to reduce the effect of thirst on the amount consumed during the later rating task; (c) because subjects were not paid for their participation, the bogus form used to solicit subjects' consent to write the counterattitudinal essay assured subjects that they would not

lose experimental credit if they did not write the essay; (d) all subjects completed a postexperimental questionnaire (described below) as the last part of the experiment. Subjects in the base-rate alcohol control condition quenched their thirst following the introduction, completed a 10-item attitude questionnaire in which the postattitude measure was embedded, and completed the alcohol taste-rating task and, finally, the postexperimental questionnaire.

Taste-rating task. The drinks in the alcohol condition were two mixed vodka drinks, each made with 2 oz. of vodka and 4 oz. of tonic water poured into glasses with no ice, which were marked *A* and *B*. The drinks differed in both the brand of vodka (Schenley or Gordon) and in the brand of tonic (Schwepps or Canada Dry). In the water condition, one glass contained 240 ml of tap water, the other the same amount of distilled water.

Procedures and instructions to the subject were identical to those of Study 1, with these exceptions: Subjects compared two rather than three drinks, the experimenter entered the room with the drinks already prepared, the number of sips taken by the subject was not observed (this measure was of little use in analyzing the data from Study 1), and the task was stopped after 10 min. instead of 15. After the amount consumed was measured, each subject in the alcohol condition was asked his/her weight in order to determine if their blood alcohol had exceeded the .05 level; no subject reached this level.

Postexperimental questionnaire. In the dissonance-alcohol and dissonance-water conditions, the postattitude measure (identical to that used in Study 1) was presented to the subject immediately after the drinking task. Subjects in all three conditions also completed a postexperimental questionnaire that was ostensibly being collected by the psychology department staff to help them evaluate students' reactions to their experimental participation. This questionnaire contained self-report items concerning the extent of perceived deception, and to measure subjects' affective reaction to the drinking task, five semantic differential items were included: pleasant-unpleasant, relaxing-tension producing, interesting-uninteresting, exciting-tedious, fun-no fun.

Results

Analysis of subjects' initial attitudes toward the tuition hike revealed no significant differences as a function of either drinking habits or condition.

Effect of Drinking on Attitude Change

If drinking eliminated dissonance-reducing attitude change in Study 1 either because of the time or distraction involved in the taste-rating task, then attitude change in the dissonance-water condition of this experiment should not exceed that in the base-rate control condition. If, on the other hand, the

dissonance-reducing effect of drinking in Study 1 was mediated by some aspect of alcohol consumption, then two effects should emerge in the present study: (a) The finding of no significant attitude change should be replicated in the dissonance-alcohol condition of this experiment, and (b) there should be significant attitude change in the dissonance-water tasting conditions. Figure 2 shows that these latter predictions were generally supported, implicating some aspect of alcohol consumption as largely responsible for the dissonance-reducing effect of drinking in Study 1. Over all of the subjects, the main effect for treatments was highly significant, $F(2, 38) = 13.27, p < .001$. Condition contrasts further revealed, in support of the dissonance-reducing effect of alcohol, that subjects in the water condition showed significant attitude change when compared with the base-rate condition, $t(42) = 4.14, p < .0001$, whereas subjects who drank alcohol during this task did not show change, $t(42) < 1$. Also, as implied by these results, dissonant-alcohol subjects changed their attitudes significantly less than dissonant-water subjects, $t(42) = 4.02, p < .0001$.

Of further interest, the dissonance-reducing effect of alcohol does not appear to depend on drinking habits. The drinking habits' main effect for postattitudes did not reach significance, $F(2, 38) = 1.65$, nor was there an interaction of this factor with experimental conditions. In fact, as can be seen from Figure 2, the pattern of condition means supporting the dissonance-reducing effect of alcohol is strongest for light drinkers. For these subjects, attitude change in the water condition is significantly greater

than attitude change in the control condition, $t(20) = 4.79, p < .001$, whereas change in the alcohol condition was even slightly less than the control level. For heavy drinkers this pattern was not as strong. Attitude change in the alcohol condition was no greater than in the control condition, but change in the water condition, though in the predicted direction, was not significantly greater than the control level. (Because of the uncharacteristically large within-cell variance for heavy drinkers' postattitudes within the water condition, a logarithmic transformation was performed on the data, and the water versus control contrast was redone. Again it was only suggestive, $p < .14$.) Nonetheless, considering the strength of this contrast over all of the subjects, it is clear that task time and distraction are not solely responsible for the dissonance-reducing effect of alcohol observed in these two experiments, nor was it mediated by drinking habits.

Effects of Dissonance on Drinking

The possibility that a true effect of dissonance on drinking had been obscured in Study 1 by high within-cell variability in subjects' drinking was addressed in the present experiment by precautions to reduce the effect of thirst on drinking. If dissonance increases drinking, subjects in the dissonance-alcohol condition should drink more vodka than control subjects for whom dissonance was not aroused. As in Study 1, however, this contrast did not reach significance either when it was tested over all the subjects ($F < 1$) or for heavy and light drinkers separately ($ts = 1.07$ and 1.03 for heavy and light drinkers, respectively). The means were again in the expected direction for heavy drinkers (80.6 ml and 122.7 ml for the control and dissonance-alcohol conditions, respectively), but not for the light drinkers (49.4 ml and 51.6 ml for the control and dissonance-alcohol conditions, respectively). Efforts to reduce within-cell variance, which was again very high (the standard deviations ranged from 35.8 ml to 128.3 ml), through scale transformations and the use of subjects' habitual drinking levels as a covariate failed to improve these contrasts. Finally, data from both experiments were combined

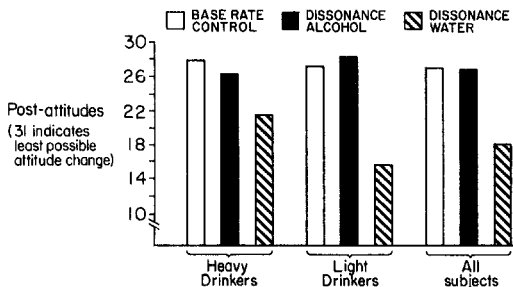


Figure 2. Postattitudes by condition and drinking habits.

to test this hypothesis. The drinking scores for heavy drinkers in the dissonance-drinking first and control conditions of both Studies 1 and 2 were combined after they were standardized to place the two measures on the same scale. Although this procedure led to mean differences that were again in the predicted direction (.208 and .034 for the dissonance alcohol and control subjects, respectively), the condition contrast failed to reach significance ($t < 1$). Because of the high variability in drinking observed in this task, the inherent mildness of the dissonance that is aroused in experiments of this sort, and the small number of subjects in the critical conditions, the present test of the effect of dissonance on the amount of drinking must be considered conservative.

The Relationship between Task Enjoyment and Drinking: Was Affect Enhancement a Cause or an Effect of Dissonance Reduction?

Drinking was positively correlated with enjoyment of the drinking task (as measured by the postexperimental questionnaire items that assessed subjects' affective reactions to the task, e.g., pleasant-unpleasant, exciting-tedious, etc.) in the dissonance-alcohol condition, $r = .54$, $n = 15$, $p < .02$, but not in the no-dissonance control-alcohol condition, $r = .06$, $n = 14$. This pattern of correlations provides suggestive evidence (these correlations differed from each other at the $p < .09$ level of significance) against the interpretation, described in the introduction, that drinking would reduce dissonance by directly enhancing the level of subjects' affect (e.g., McCollam et al., 1980; Mello, 1968), thereby eliminating the unpleasantness of dissonance.⁴ If drinking directly enhanced affect in this research, it should have been positively correlated with task enjoyment among no-dissonance, control subjects, as well as among dissonance subjects. The fact that it was not suggests that greater task enjoyment may have been an aftereffect of dissonance reduction that was brought about first by some other effect of drinking, such as a possible disinhibitory or tension-reducing effect.

It will also be noted that there were no condition differences on the task enjoyment

measure ($F < 1$). Thus, although overall task enjoyment was equally strong in all three experimental conditions, it was linked to the amount of drinking only in the dissonance-alcohol condition.

Discussion

The results of this study provided little support for the hypothesis that dissonance increases the amount of drinking, but they did replicate the finding of Study 1 that whatever amount of self-regulated drinking takes place during this task is enough to eliminate dissonance-reducing attitude change. Furthermore, beer and vodka drinks are apparently equally effective at accomplishing this effect. The finding of significant attitude change in the water-tasting condition also made it less credible that the time and distraction involved in the drinking task were themselves sufficient to cause the dissonance-eliminating effect. Also, the dissonance-reducing effect of drinking does not appear to depend on subjects' drinking habits; drinking eliminated attitude change for light as well as heavy social drinkers.

This finding for light drinkers also discredits another version of the distraction explanation. It might be argued that even though the water and alcohol conditions involved the same task, heavy drinkers were still more distracted from their dissonant cognitions in the alcohol condition because of their greater interest in and liking for alcohol. The results for the light drinkers, however, who were selected for not liking alcohol, indicate that this degree of distraction, if it occurred, is not necessary for drinking to eliminate dissonance. Furthermore, light drinkers in the dissonance-alcohol condition, where drinking eliminated dissonance, rated the drinking task as no more interesting and

⁴ It will be noted that to measure the effect of drinking on affect enhancement, the subjects' general moods should have been measured rather than their enjoyment of the specific drinking task. Nonetheless, because any measure of mood had to be taken after both the drinking task and the postattitude measure, it would have been impossible to know which of these factors—drinking or dissonance reduction through attitude change—was responsible for subjects' moods. Thus, to focus this measure on the effects of drinking, subjects were asked to complete the mood scales in specific reference to the drinking task.

exciting on these postexperimental questionnaire items (the means were 17.0 and 17.1, respectively, on 31-point scales where larger numbers indicated less interest and excitement) than light drinkers in the dissonance-water condition (the same means were 10.25 and 16.0), where attitude change was significant. Thus, a greater involvement in the alcohol-tasting task that might result from heavier drinking habits, or from the alcohol task being generally more interesting and exciting than the water task, is not necessary for drinking to eliminate dissonance. In fact, heavy drinkers in the dissonance-alcohol condition, where dissonance was eliminated, rated the tasting task as no more interesting ($M = 11.3$) and exciting ($M = 17.6$) than light drinkers did in the water condition, where attitude change was significant. (Heavy drinkers in the water condition, however, were sufficiently disappointed in the tasting substance as to rate the task more uninteresting, $M = 25.0$, and less exciting, $M = 21.3$.) Thus drinking alcohol is sufficient to eliminate dissonance in this paradigm regardless of whether subjects habitually like to drink alcohol or find the task particularly interesting or exciting.

Finally, correlational evidence indicated that subjects' affective reaction to the drinking task was positively related to alcohol consumption only for subjects who were already experiencing dissonance. This result suggests that drinking reduced dissonance not by directly inducing positive affect but by relieving the unpleasantness of dissonance through a direct disinhibitory or tension-reducing effect.

Study 3

Studies 1 and 2 support the notion that drinking alcohol can eliminate dissonance-reducing attitude change, regardless of one's drinking habits, and discredit trivializing alternative explanations that have to do with the task. At this point, however, another question arises: Does the dissonance-reducing effect of drinking in this research result from a type and magnitude of effect that is specific to drinking alcohol or from more general effects (e.g., mild affect enhancement, the above correlational evidence not-

withstanding) that might result from drinking any moderately pleasurable substance in this drinking task, such as coffee, coca cola, and so forth? Study 3 examines this question by replicating the general procedure and design of Study 1 except that coffee tasting was used in place of beer tasting and subjects were required to be coffee drinkers. If coffee drinking, a presumably pleasurable activity for coffee drinkers, is sufficient to eliminate dissonance-reducing attitude change, then it could be concluded that the dissonance-reducing effects of drinking observed in Studies 1 and 2 were not mediated by effects that were specific to drinking alcohol but by effects that were at least common to coffee drinking as well. If, however, coffee drinking failed to reduce dissonance, then the dissonance-reducing effects of drinking cannot be attributed to the type or magnitude of effects that result from drinking coffee.

Method

The design of this experiment followed exactly that of Study 1 except that no base-rate control condition was included, nor was there a drinking habits factor. This left a 2×2 design in which the first factor was whether subjects wrote a dissonant or consonant essay (both under conditions of high choice), and the second factor was whether subjects drank before or after the measurement of their postattitudes.

As in Study 2, eligible subjects were identified through the administration of a Biographical Attitudes and Life Style questionnaire in psychology classes, which included an item asking for the number of coffees respondents drank per day and an item assessing their attitudes toward a tuition increase (on an 11-point scale). Students who were opposed to a tuition hike and drank one or more cups of coffee per day were then telephoned and offered extra class credit for participation. Forty-one subjects (29 females and 12 males) were recruited in this fashion and randomly assigned to the experimental conditions, with the restriction that equal proportions of males and females be assigned to each condition. These subjects averaged 2.7 cups of coffee per day.

The procedure of this experiment followed that of Study 1 except that the taste-rating task involved the following changes: Subjects compared two blends of coffee rather than three beers, and subjects using cream and/or sugar were instructed to add equal amounts of each to each coffee. As in Study 2, the tasting task lasted for only 10 min.

Results

Analysis of subjects' initial attitudes toward the tuition hike revealed no significant condition differences.

Figure 3 shows that more favorable attitudes toward the tuition hike resulted in the dissonance conditions than in the consonant conditions regardless of whether subjects drank coffee before or after the attitude measure. The dissonance main effect was statistically significant, $F(1, 40) = 4.15$, $p < .05$. Also, the dissonance condition in which subjects drank prior to the attitude measure produced significantly more attitude change than either the consonant-coffee first condition alone, $t(15) = 2.41$, $p < .03$, or both consonant conditions combined, $F(1, 29) = 6.02$, $p < .02$. Unlike drinking alcohol, drinking coffee had no dissonance-reducing effect on attitudes in this paradigm.

Also, mirroring the findings of the earlier studies, dissonance had no effect on the amount of coffee subjects consumed in this experiment. (The means in milliliters were dissonance-coffee first = 198.18; dissonance-attitude first = 181.82; consonance-coffee first = 192.78; consonance-attitude first = 223.00.)

Discussion

These results clearly show that the dissonance-reducing effect of self-regulated alcohol consumption does not generalize to self-regulated coffee consumption. This finding, of course, does not preclude the possibility that other substances would have a dissonance-reducing effect. It does make it less plausible, however, that the consumption of just any moderately pleasurable substance is sufficient to reduce dissonance.

Also, the inability of coffee drinking to eliminate dissonance-reducing attitude change among people who like coffee—taken together with the relevant findings

from Study 2—supports the conclusion that the time and distraction inherent in the tast-rating task (including the distracting involvement that might result among people selected for liking the tasting substance) are not sufficient in themselves to account for the dissonance-reducing effect of drinking alcohol.

This result is also relevant to a misattribution explanation of the observed alcohol effect: Dissonant subjects who drank alcohol prior to the attitude measure in Studies 1 and 2 somehow attributed their dissonant feelings to the drinking rather than to the dissonant essay and, thereby, felt less pressure to change their attitudes. As noted earlier, because the drinking task followed dissonance arousal by 10 min. in these experiments, it is unlikely that subjects could have misattributed the arousal caused by the essay to the act of drinking. The finding that drinking coffee—another plausible source of arousal to which dissonance caused by the essay could have been attributed—also failed to eliminate dissonance-reducing attitude change provides empirical support for this reasoning.

General Discussion

Perhaps the most important finding of the present research is that self-regulated drinking can very quickly reduce cognitive dissonance, as indicated by its elimination of dissonance-reducing attitude change within 10 min. after drinking began. Studies 1 and 2 found that although dissonance arousal seemed to have little effect on the amount of drinking, whatever drinking subjects did was sufficient to eliminate dissonance, regardless of the subjects' drinking habits. Furthermore, the fact that neither water nor coffee consumption had a similar dissonance-reducing effect eliminates a variety of alternative explanations of the alcohol effect and supports the notion that drinking has a specific capacity to relieve this type of psychological distress. The connection between drinking and dissonance established in this research reinforces the view that normal social-psychological processes may play a role in the etiology of alcohol abuse. Psychological distresses of the sort aroused by

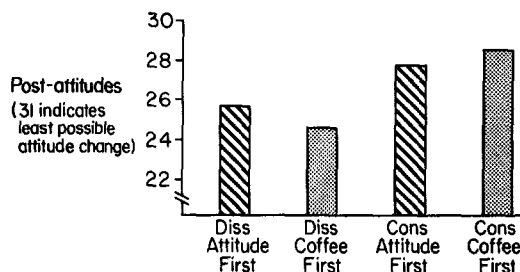


Figure 3. Postattitudes by condition.

the dissonance-producing procedures of this research are a common part of everyday life. Any situation in which one's behavior can be evaluated against an internalized value, attitude, or standard is a potential source of dissonance and related aversive feelings. Thus, the evidence that independent of drinking habits even light drinking can quickly alleviate this type of distress, and the fact that such distress is so common, suggests that some forms of alcohol abuse may evolve through the frequent reinforcement of drinking as a response to these tensions—tensions that in the present instance were the by-products of normal social-psychological processes of self-regulation.

Processes Underlying the Dissonance-Reducing Effect of Drinking

At the outset of this article, several processes that might be initiated by drinking alcohol (i.e., affect enhancement, psychological disinhibition, tension reduction) were discussed as possible mediators of any dissonance-reducing effect of drinking. Though the results of the completed experiments do not conclusively identify a single mediating process, they do enable us to exclude a number of possibilities—which by convergence helps to establish the nature of the observed effect—and to grade other possibilities as to their plausibility. We believe, for example, that in ruling out the trivializing explanations of this effect that have come to our attention, the present experiments establish that the dissonance-reducing effect of drinking is not an artifact of experimental procedures but results from some specific effect of drinking alcohol that is not dependent on drinking habits.

In evaluating the plausibility of the remaining explanations, the finding in Study 2 that task enjoyment was positively correlated with drinking in the dissonance condition but not in the control condition is perhaps most useful. This pattern of correlations suggests that drinking did not reduce dissonance by *directly* inducing enough positive affect to overwhelm the unpleasantness of dissonance but by somehow reducing dissonance first, which then resulted in affect enhancement as a result of dissonance re-

duction. Thus, through a process of elimination—never a completely satisfying process—the most plausible account of the observed drinking effect appears to be that drinking directly reduced dissonance through its capacity as a disinhibitory or tension-reducing agent. The more alcohol that dissonant subjects drank, the freer they may have felt from the internalized pressure to reestablish psychological consistency in this situation (i.e., a disinhibition effect), or the more they drank, the more they may have relaxed (e.g., Mayfield, 1968). In either case, drinking would be positively associated with task enjoyment. Future research can evaluate the extent of physiological and cognitive mediation of the observed drinking effect. (The “balanced placebo” design used by Ross, Krugman, Lyerly, & Clyde, 1962, and reviewed by Marlatt and Rohsenow, 1980, for example, was developed for this purpose.) This question aside, however, the dissonance-reducing effect of drinking seems most plausibly interpreted as resulting from the disinhibitory or tension-reducing effects of drinking alcohol.

Effects of Dissonance on Drinking

Throughout these experiments, dissonance failed to increase drinking. The apparent puzzle this presents is that if drinking disinhibits dissonance or reduces tension, why does dissonance not increase the amount of drinking? Several considerations are relevant. First, as noted earlier, the hypothesis that dissonance would increase drinking may have been insensitively tested in this research. Thus, before abandoning the hypothesis, future research should attempt to test it more sensitively. As importantly, although drinking may have reduced dissonance through the hypothesized mechanisms, some amount of experience with alcohol may be necessary before the drinking-dissonance reduction connection is learned well enough for dissonance to motivate greater drinking. This view is consistent with the finding that only heavier social drinkers in these experiments showed a consistent (though insignificant) tendency to drink more after dissonance arousal. Also, because even small amounts of drinking

proved sufficient to reduce dissonance in these experiments, it is possible that dissonance was eliminated early in the drinking episode and simply did not persist long enough to motivate further drinking. Dissonance may have a greater effect on the choice to drink or not to drink than on the amount of drinking. This would be especially likely if it was the knowledge that one is drinking alcohol (as mediated by the expectations subjects have about the effects of drinking) rather than the pharmacological properties of alcohol, which mediated its dissonance-reducing effect. Future research will have to sort out these possibilities. For the present, however, these considerations suggest several reasons why drinking may have reduced dissonance without dissonance having had a strong effect on the amount of drinking in these experiments.

Theoretical Implications

Dissonance theory. Together with the evidence that dissonance-reducing attitude change can be eliminated by a tranquilizing drug that relieves the unpleasantness of dissonance (i.e., Cooper et al., 1978), the present findings suggest that dissonance may be commonly reduced through activity that in some way alleviates the unpleasant feelings associated with the cognitive conflict. Thus, although dissonance theory itself has focused on cognitive change as the primary mode of dissonance reduction (i.e., a change in a behavioral or environmental cognitive element or the addition of new cognitive elements), the mounting evidence, of which the present research is a part, suggests that despite man's motivation for cognitive consistency, his perseverance for it may be easily usurped by immediate gratifications.

The tension-reduction hypothesis. The classic tension-reduction hypothesis of drinking (Conger, 1956) reasons that a state of tension from some source energizes the drinking response, which, in turn, is reinforced through alcohol's ability to reduce the tension. The present finding that drinking reduced dissonance is, therefore, consistent with this hypothesis, though the finding that dissonance had little effect on the amount of drinking is not. These results might thus

be viewed as providing partial support for the hypothesis. It is important to note, however, that such support would be for only a specific version of the tension-reduction model, namely, that drinking, possibly through its disinhibitory effects, is capable of reducing cognitive dissonance. These results thus have little bearing on the global utility of the tension-reduction hypothesis.

A Practical Implication

As noted above, because of the ability of drinking to reduce dissonance, drinking may be easily learned as a response to this form of distress, especially when the individual has few alternative coping skills. In support of this reasoning, Marlatt and Gordon's (1979) analysis of the relapse episodes of a sample of alcoholics who were trying to abstain from drinking revealed that the most frequent precipitator of relapse (38% of the time) was "intrapersonal negative emotional states." An implication of this analysis, then, is that in order to reduce the appeal of drinking as an effective and fast-working response to these stresses, alcoholism prevention and treatment programs should emphasize training in alternative means of handling dissonance and related negative emotions as well as in drinking management and abstinence techniques.

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