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COLLEGE STUDENT DRINKING AND
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# COLLEGE STUDENT DRINKING AND THE INTERPERSONAL MEASURES OF DIFFERENTIATION AND EXTENSION

By

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Interpersonal Checklist. Drinking was measured in four ways: (1) a drinking score, in ounces of absolute alcohol, (2) a drinking pattern index, (3) drinking category (light, moderate, heavy), and (4) drinking category including abstainers.

Analyses of variance for the factors of differentiation (high, low), extension (high, low), and sex, disclosed a significant effect for extension (based on the people orientation scale). Those classified as high on this extension measure had a significantly lower mean drinking score than those classified as low on this extension measure. Men had a significantly greater mean drinking score than women. However, the mean differences in the drinking score for the differentiation factor levels, while not significant, were opposite to that hypothesized for both differentiation measures. Those classified as low in differentiation showed lower average drinking scores than those classified as high in differentiation.

Separate discriminant analyses, for males and females, of the drinking pattern and of the drinking category groupings did not reveal significant distinctions based on the differentiation or the extension measures. Only the discriminant analysis for males, which included abstainers, significantly distinguished abstainers from drinkers on the extension measure based on the Lov scale, and significantly distinguished abstainers from heavy drinkers on the

differentiation measure based on the differentiated role scale. The male abstainers scored significantly higher on the Lov scale and significantly lower on the differentiated role scale than the drinkers.

On the basis of these results, it was proposed that differentiation-extension might be regarded as a bipolar factor representing a dimension of relatedness to others. This would imply that college students who like people, and who view themselves as like other people, drink less alcohol than those who see themselves as distant from and different from other people. The relevance of this differentiation-extension dimension to Alcoholics Anonymous therapy and implications of the findings for future studies of drinking populations were discussed.

Many have helped along the way.

Thank you, one and all.

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# INTRODUCTION

The drinking of alcohol is associated with a variety of social and psychological conditions and individual differences. Cross cultural observation and research indicate that alcohol consumption is usually regulated by tradition in institutionalized settings (Bacon, Barry & Child, 1965; Bacon, 1974; Horton, 1943). Many differences in drinking practices can be understood within a sociocultural rubric. Beyond these considerations, however, an understanding of individual variation in the use of alcohol calls for the inclusion of personality concepts (Hogan, DeSoto & Solano, 1977; Jessor, Carman & Grossman, 1968; Kessel & Walton, 1965; McClelland, Davis, Kalin & Wanner, 1972). The present study of alcohol use by college students employed Smith's (1979) composite theory of personality. Central to this theory are the developmental trends of differentiation and extension. Figure 1 pictures these trends, and adds the dimension of organization of the self (Smith, 1979, p. 23).

## Differentiation - Extension

In studying differentiation, Smith (1966, 1973) has demonstrated that the tendency to assume similarity or

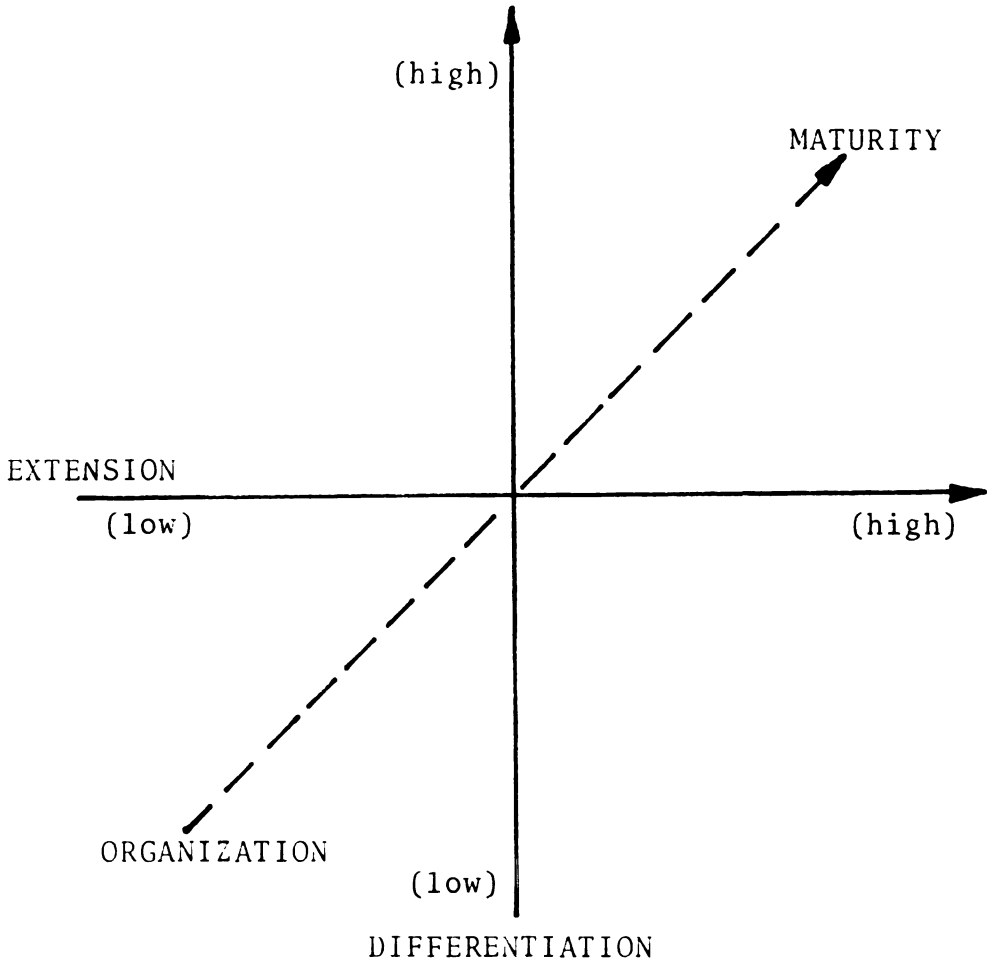


Figure 1. Trends toward organizational maturation. (Modified from Smith, 1979)

dissimilarity to others is a relatively consistent property of a person's social perception. Wegner (1971) in his study of self-other differentiation concluded that assumed similarity is an extension of Witkin's (1962) theory of psychological differentiation: "articulated individuals are able to differentiate themselves from others, and assume dissimilarity to most people" (Wegner, 1971, p. 21).

What enters into the development to extend ourselves? Smith (1979) states that, "the increasing satisfaction of the need for love results in the increasing extension of the self" (p. 23). The composite theory assumes a developmental sequence to extension and differentiation. However, the natural development of a person may be retarded at any stage: "The composite theory assumes...that it is of critical importance in understanding a particular person to know the highest form of self he has attained" (Smith, 1979, p. 24). The present study explores the contribution of the composite theory to an understanding of drinking behavior in college students.

## Drinking Motives

In looking at the variety of reasons for drinking, Jessor, Graves, Hanson and Jessor (1968) point out that, at least in American society, there have been three broad categories emphasized. These categories, based on the works of Mulford and Miller (1959, 1960b) and Fallding (1964), have

been termed: social-convivial, social-facilitating, and personal-effects reasons.

Social-convivial drinking is done for the enjoyment of the ongoing social interaction associated with it. Social-facilitating drinking is done to overcome social apprehensions and anxieties. Drinking for personal-effects reasons involves the use of alcohol for coping with many types of personal inadequacies and fears.

In a later paper, Fallding and Miles (1974) proposed four types of normal or social drinking: ornamental-community-symbolic, facilitation, assuagement, and retaliation. Ornamental-community-symbolic is drinking that is ritualistic and ceremonial and is seen by Fallding and Miles as appropriate. Facilitation drinking, done for relieving social tensions, was the typical kind of drinking they found. Assuagement drinking, done to drown one's sorrows, and retaliation drinking, aimed at harming others, they found to be uncommon.

## Personal Motives and Drinking

A number of studies have shown higher alcohol consumption associated with personal meanings and motives for drinking rather than social meanings and motives (Cahalan, Cisin & Crossley, 1969; Mulford & Miller, 1960a; Riley, Marden & Lifshitz, 1948). Investigations into the relation of personality dimensions and drinking levels provide a

means of insight into psychological bases of drinking behavior. Heavier drinking involves aspects of personality which have been called "personal" or "immature". Previous studies have shown that heavy drinkers evidence differences in personality from light or nondrinkers before the development of their different drinking styles (Jessor, Collins & Jessor, 1972; Jones, 1968; Jones, 1971). These personality differences can be seen as factors leading to variations in drinking behavior.

## Drinking Specific - Nondrinking Specific Theories

Zucker (1979) identifies two types of theory about the development of drinking. Drinking specific theory, which characterizes drinking activity in terms related specifically to alcohol variables (for example, the availability of alcohol). Nondrinking specific theory, on the other hand, sees the drinking process in terms that include alcohol consumption, but which primarily involve more central human behavior need patterns not intrinsic to drinking. He notes that, "from a developmental standpoint, nondrinking specific theories have a potentially greater ability to map continuities in process over longer periods of the life span, insofar as they allow for varied phenetypic expression of underlying and presumably more enduring characteristics" (p. 10). The present study takes the viewpoint of a nondrinking specific theory.

College Population

A college population is of particular interest in studying drinking behavior since it is during this age of young adulthood (18-22 years) that drinking quantity typically reaches a peak (Harford & Mills, 1978; Vogel-Sprott, 1974). This age range also has the highest percentage of drinkers, both of men and women (DHEW, 1974). Zucker (1979) in referring to these statistics of age and drinking states that, "In short, from a drinker vs. nondrinker standpoint, cross-sectional evidence indicates that old age (or a pattern similar to it) starts around age 22 and continues unabated from there on" (p. 44).

Sex Differences

Differences in male and female problem drinkers have been reported by many investigators (Beckman, 1975; Curlee, 1970; Lisansky, 1957; Rimmer, Pitts, Reich & Winokur, 1971). Jones (1971) suggests that women who drink excessively are more unlike the average female drinker than men problem drinkers are unlike the average male drinkers. This is consistent with the notion that for women, the social prescriptions against excessive drinking are greater.

At present the differences in drinking behavior between men and women remain substantial (DHEW, 1974; Harford & Mills, 1978; Wechsler, Demone & Gottlieb, 1978). Indications of a decreasing of the historic difference in drinking

practices between males and females, particularly among teenagers, have been reported recently (Wechsler & McFadden, 1976; Wilsnack & Wilsnack, 1978).

Keil (1978), in summarizing studies of men's and women's drinking, reports the general results that women have been found to be less likely than men to drink and to consume less on occasions that they do drink. He suggests, however, that as sex roles continue to change in American society, women can be expected to drink more and to drink more frequently.

Differentiation and Alcohol Use

Psychological Differentiation, which was originally considered in a more limited form as field dependence/independence, has received wide attention in studies of alcoholism. People who are less differentiated tend to have difficulty in delimiting an object from its surrounding visual field, as on the Rod and Frame Test (Witkin, Lewis, Hertzman, Machover, Meissner & Wapner, 1954). The less differentiated display a limited capacity for analyzing their internal processes and depend a good deal on external cues. Psychologically differentiated people, by contrast, perceive an object as distinct from its field and are more independent of the influence of context (Witkin, Dyk, Faterson, Goodenough & Karp, 1962; Witkin, 1965). The results of numerous studies (Harley, Cohen & Silverman, 1974; Hoar, 1977; Karp, Witkin

& Goodenough, 1965a, 1965b; Witkin, Oltman, Cox, Ehrlichman, Hamm & Ringler, 1973) have shown alcoholics to be a field dependent and less differentiated population than their non-alcoholic counterparts. Moreover, a number of studies show that alcoholics manifest a significant decrease in field dependence following a treatment program (Chess, Neuringer & Goldstein, 1971; Goldstein & Chotlos, 1966; McWilliams, Brown & Minard, 1975).

Extension and Alcohol Use

Lolli (1956) characterized alcoholism as a disorder of the love disposition. He described alcoholics as having difficulty in reaching out to love another. Bacon (1974), in considering the results of a large-scale cross-cultural study of drinking, pointed to the need for an affiliative dimension in the study of alcohol use. Other studies relating problem drinking to facets of alienation (Blane, Hill & Brown, 1968; Kane & Patterson, 1972), social deviance (Jessor, Graves, Hanson & Jessor, 1968), and weak family affectional ties (Zucker, 1979) implicate conceptualizations that we would term low extension of the self. Jessor, Carman and Grossman (1968), in their study of drinking patterns of college students, point out that, along with academic achievement, the goal of social affection or inter-personal liking is one of pervasive importance for students. In addition, they note that, drinking alcohol is one of the learned

activities available to college students for dealing with disappointment in this area.

## The Problem

The primary purpose of the present study is to explore the relation of Smith's (1979) composite theory of personality to drinking in a college student population.

The two major dimensions (Figure 1) of the composite theory are differentiation and extension. Smith (1979) defines differentiation as the degree to which a person senses a clear and articulated distinction from the personal and physical environment. A differentiated person recognizes clear differences between self and others. Smith (1979) defines extension as the degree to which a person senses a feeling of being united with others. An extended person feels close to other people. Smith's (1979) picture of development (Figure 1) shows a growing organization of the self in the direction of increasing differentiation and extension. This is seen as a progression of maturation.

The notion that alcohol consumption and maturity are connected was investigated by Jung (1977). He surveyed male and female college students to determine the relationship between the Jessor, et al. (1968) quantity - frequency index of drinking and the maturity level of motives for drinking. Jung found that both male and female students with immature motives for drinking (e.g., to get "smashed") drank about

three times as much as those with mature motives (e.g., just to be friendly). Men drank about twice as much as women regardless of motive.

Summary and Hypotheses

Indications that greater drinking is associated with a diminution of differentiation and extension have been reviewed. Looking at alcohol use, and its relation in the developmental process within the framework of the composite theory, gave rise to the following hypotheses:

1. Persons classified as low on differentiation will have greater alcohol use scores than those classified high on differentiation.
2. Persons classified as low on extension will have greater alcohol use scores than those classified as high on extension.
3. Persons classified as low on both differentiation and extension will have greater alcohol use scores than all others.

Congruent with alcohol use history, it is hypothesized that:

4. Males will have greater alcohol use scores than females.

For discrete categorizations of drinking, it is hypothesized that:

5. Differentiation and extension measures will discriminate among the drinking pattern groups.

6. Differentiation and extension measures will discriminate among the light, moderate, and heavy drinking groups.
7. Differentiation and extension measures will discriminate among the abstainer, light, moderate, and heavy drinking groups.

# METHOD

The principle aim of the present study was to test hypotheses relating the composite theory of personality (Smith, 1979) to college student drinking. A survey of campus residence halls was undertaken to gather data for measuring the differentiation and extension dimension of the composite theory and for determining the amount of alcohol use by students.

## Subjects

Of the 600 questionnaire booklets distributed to students in the campus residence halls of Michigan State University, 495 were returned (83%). This sample population, by college year and sex, is displayed in Table 1.

## Sample Selection

A modification of the procedure described by Stratoudakis (1976) for sample selection from residence halls at Michigan State University was used as follows: a printout of the campus residence hall population by college year and sex was used to select a residence hall from each of the four major residence complexes (north, south, east, and west) that, in the judgement of the present investigator, had an

TABLE 1

Number of Subjects by
College Year and Sex

| College Year | Males | Females | Total |
|---|---|---|---|
| Freshman | 70 | 121 | 191 |
| Sophomore | 78 | 78 | 156 |
| Junior | 42 | 48 | 90 |
| Senior | 21 | 15 | 36 |
| | | | 473 |

Note: 22 respondents did not report college year or sex.

optimal balance of males and females and an optimal representation by college year and which, according to the director of residence hall programs, had not recently been overly used for survey research. Students present in their rooms of the selected residence halls were asked to participate in the study, on a voluntary basis, by completing a questionnaire booklet (see Appendix A for booklet and instructions used). Approximately one hour after distribution the questionnaires were personally collected at the students' rooms. The sample population by residence hall and ethnicity is shown in Appendix B.

## Instruments

The questionnaire booklet (reproduced in Appendix A) contains the following: (1) Drinking Inventory, (2) Attitudes Toward Leadership, (3) Preference Inventory, (4) Interpersonal Check List, and (5) Demographic Items.

The study utilized two measures of differentiation:

(1) The differentiated role score from Attitudes Toward Leadership.

(2) The dissimilarity score from the Preference Inventory (Note 1).

And two measures of extension:

(1) The people orientation score from Attitudes Toward Leadership.

(2) The Lov score from the Interpersonal Check List.

The Drinking Inventory yielded three measures:

(1) A score giving the amount of absolute alcohol consumed per day.

(2) An index for pattern of alcohol consumption.

(3) An index for category of drinking.

## Measuring Alcohol Consumption

In a comparison of three common methods of describing alcohol consumption Little, Schultz, and Mandell (1977) proposed "a new scoring system which not only combines the strength of the three methods ... but also preserves much information on volume and variability of alcohol consumption" (p. 554).

The three methods they examined were: (1) the Quantity-Frequency-Variability Index, and (2) the Volume-Variability Index, both devised by Cahalan, Cisin, and Crossley (1969); and (3) the Jessor, Graves, Hanson and Jessor (1968) method of estimating average daily ounces of absolute alcohol ingested. Little, et al. (1977) called this latter average the absolute-alcohol (A-A) score. In addition, Little and her colleagues devised a pattern of consumption measure they called the Quantity-Pattern (Q-P) index. This Q-P measure is a four point scale designed to detect a pattern of heavy consumption. Little, et al. (1977) described this A-A -- Q-P index as "an estimator which permits maximum information on alcohol consumption to be retained without recourse to the original instrument. Its flexibility and precision allow a simple yet thorough description of reported drinking behavior" (p. 562).

The method for measuring alcohol consumption used in this study follows that suggested by Little, et al. (1977). The A-A score, based on the Jessor, et al. (1968) scoring procedure, is used to measure aggregate volume, and the pattern of consumption is identified by the Q-P index. The aggregate volume of total ounces of alcohol ingested per day is a composite score for the three beverages. Since the data included a range of consumption, and since beer, wine and liquor differ in the amount of absolute alcohol, a rather complicated scoring procedure was used to calculate

the absolute-alcohol (A-A) score. (See Appendix C for detailed computational procedure of A-A score).

The average ounces of absolute alcohol consumed per day is referred to by Jessor, et al. (1968) as an individual's Quantity-Frequency or "Q-F" score; and referred to by Little, et al. (1977) as an Absolute-Alcohol or "A-A" score. Because quantity-frequency has at times been used differently by different writers, the term drinking score will be used in this study to refer to this calculated composite absolute alcohol (A-A) score.

The Inventory of Drinking Behavior

The inventory of drinking behavior (see Appendix A) used in this questionnaire survey is from: Scale 10: Drinking, of the "Community Survey Interview Schedule" in Jessor, et al. (1968).

Frequency data were obtained for each of the three major beverage types by the following categories:

Three or more times a day
Two times a day
About once a day
Three or four times a week
Once or twice a week
Two or three times a month
About once a month
Less than once a month, but at least once a year
Less than once a year
Never

"This order of presentation...is intended to make it easier for fairly regular daily drinkers to admit to their high frequency by suggesting that ever higher frequencies among some subjects were anticipated..." (p. 167).

Following the frequency question were three quantity questions concerning "5 or more drinks", "3 or 4 drinks", and "1 or 2 drinks", for each beverage type, with the following categories:

Nearly every time
More than half the time
Less than half the time
Once in a while
Never

In describing this procedure Jessor, et al. (1968) remarked that:

> The advantages of such an obviously time-consuming approach are several. First, and most general, by breaking down a complex behavioral syndrome such as drinking into several component parts, the accuracy with which the respondent was able to recall his own behavior may have been increased. Second, it enables a beverage-by-beverage analysis of drinking habits. Third, it differentiates the pattern or regularity of consumption of varying amounts of a beverage enabling a distinction to be made, for example, between a drinker who always drinks moderately and one who is usually a light drinker but sometimes drinks heavily. (p. 168)

Drinking Score

The measures of alcohol use were obtained by asking, for each type of beverage (beer, wine, spirits): (1) how often (frequency) the beverage is drunk, (2) how much at one time (quantity) the beverage is drunk. The quantity responses were converted to units of absolute alcohol and multiplied by

a weighted frequency to give an absolute alcohol score for each type of beverage. The three beverage scores summed yield a total absolute alcohol score. This drinking score represents an average amount of absolute alcohol consumed per day.

Jessor, et al. (1968) point out that this composite measure of volume of alcohol has a number of distinct virtues:

1. It summarizes, in a single figure, quantity, frequency, and range of consumption of beverages differing in alcoholic content;
2. this figure, average ounces of absolute alcohol consumed per day, is readily comprehensible and can easily be translated into other meaningful units, such as "beers" or "drinks",
3. the score permits the calculation of group statistics such as means and medians which are not possible when discrete descriptive categories are employed; and,
4. the score is continuously distributed along a single dimension permitting correlational analyses, tests of differences between group means, and other statistical comparisons. (pp. 168-169)

Quantity-Pattern Index

While they alluded to this scale's ability to reflect pattern of drinking, Jessor, et al. (1968) only used a volume measure of alcohol consumption. It was Little, et al. (1977) who devised a method to score this scale for pattern of alcohol consumption. The Q-P categories indicate the average frequency of heavy drinking over the time measured. The Q-P index values provide an ordered scale of four points reflecting how frequently a drinker has five or more drinks

on a single occasion. Category A = zero times, Category B = more than none but less than one time, Category C = one or more but less than 4.2 times, Category D = 4.2 or more times. The value 4.2 was chosen so that subjects reporting five or more drinks "once or twice a week" "more than half the time" are included in Category D (Little, et al. 1977, p. 559).

Drinking Categories

In order to classify amount of drinking into discrete categories an index devised by Yano, Rhoads, and Kagan (1977) was employed. Their index of drinking is based on converting beverage intake to the amount of absolute alcohol consumed per day. The drinking score computed for this present study can be directly converted to this index. The categories, called light, moderate, and heavy by Yano, et al. (Note 3), were defined as follows:

> Light drinkers consume some, but not exceeding 1/3 ounces of absolute alcohol per day. Moderate drinkers consume more than 1/3 ounces but not exceeding two ounces of absolute alcohol per day. Heavy drinkers consume more than two ounces of absolute alcohol per day.

Putting these categories roughly in everyday terms, the light drinker would have less than one liquor based drink, bottle of beer or glass of wine a day. The moderate drinker would

have approximately one to three liquor based drinks, bottles of beer or glasses of wine per day. The heavy drinker would have approximately four or more liquor based drinks, bottles of beer or glasses of wine per day.

The term "heavy drinking" has been criticized as perhaps suggestive of problem drinking (Marden, Zylman, Fillmore & Bacon, 1976). In this present study we are using the terms "light", "moderate", and "heavy" to refer only to relative position, each progressive category indicates more drinking than the previous one. Thus, the category "heavy drinking" is not synonymous with problem drinking or alcoholism.

Verdicality of Drinking Inventory

In order to maximize the truthfulness of respondents' self-reporting, they were assured complete confidentiality and anonynimity. No names or student numbers were recorded on the questionnaire or answer sheets and only summary statistics were used.

Following the practice of Jessor, et al. (1968) the drinking inventory was placed near the end of the questionnaire in the hope that the respondent would have become used to answering questions of a personal nature. Respondents were asked questions of the type: "how often" a particular drinking behavior was engaged in, rather than "have you ever". Thus, simple acquiescence was not sufficient to

complete the task; the respondent had to give consideration to the frequency of engaging in various drinking behaviors.

Although there is reasonable concern with accepting at face value the alcohol use score as a wholly accurate representation of the amount of drinking taking place in the college residence hall community, Jessor, et al. (1968) note that in this measure:

> If we make the assumption that the distorting effects of memory and self-protection have a roughly equal influence upon all respondents, then we should at least be able to order the respondents fairly accurately with respect to their drinking behavior. Even without such an assumption, groups of respondents can probably be ordered accurately since individual differences in amount of distortion can then be readily assumed to cancel each other out. The actual scores reported by the respondents are simply considered as symbolic of the extent of the particular behavior being studied. (p. 179)

## Measures of Differentiation and Extension

The definitive characteristic of differentiation is that of distinguishing oneself from others. The scale used in this study as the primary measure of differentiation was the differentiated role scale from Attitudes Toward Leadership (Smith, 1973). The scale used as the secondary measure of differentiation was the dissimilarity score from the Preference Inventory (Smith, 1973). The definitive characteristic of extension is feeling towards others in a concerned and united way. The scale used in this study as the primary measure of extension was the people orientation scale from

Attitudes Toward Leadership. The scale used as the secondary measure of extension was the Lov scale from the Interpersonal Check List (LaForge, 1973).

Attitudes Toward Leadership

This is a thirty-two item instrument requiring the respondent to pick which of two statement pairs is more important for a leader to do. The first sixteen items provide a measure of people orientation, and are scored for those responses chosen where the leader shows a positive consideration for the work group. The second sixteen items provide a measure of role differentiation, and are scored for those responses chosen where the leader is responsible for a differentiated role in the work group.

Both scales have reported internal consistency reliabilities above .80 (Smith, 1973).

Preference Inventory

This test was designed by Smith (1973) to provide a measure of assumed similarity to others. It contains twenty four self-description items of the true-false type.

To answer the question, what is a person who generally assumes a great deal of similarity like?, Smith (1974) used the following procedure:

> From a group of several hundred college students, 25 who consistently assumed a great deal of similarity were matched with 25 of the same sex and intelligence who consistently assumed little similarity. Both groups

> answered the 200 statements in the five-trait scale [of a large personality inventory]. The answers of the empathic [assumed similarity] and the nonempathic groups were compared and the 48 statements that they answered most differently were isolated. These 48 statements were answered by a second group of empathic and non-empathic students. The 24 statements [chosen] ... are those that most sharply separated the high-empathy from the low-empathy groups. (p. 160)

In scoring the scale for use in this study as a secondary measure of differentiation, the items were reflected in the direction of dissimilarity. Thus, a respondent's high score is in the differentiated direction.

The alpha reliabilities computed from the present data for the Preference Inventory and the two scales from Attitudes Toward Leadership are presented in Appendix D.

### Interpersonal Check List

The Interpersonal Check List "is a 134-item list of words or phrases which may be used to obtain self-description or description of others with respect to an interpersonal domain of personality" (LaForge, 1973, p. 1). The summary factor Lov (love-hate) used in this study as a secondary measure of extension was obtained by calculating a weighted sum of a person's set of responses to the list items constituting the Lov scale. Internal consistency reliabilities (based on commonalities) for self description of the Lov scale are .90 (LaForge, 1973). The Interpersonal Check List was scored using a computer program developed by Krus and Krus (1977).

## Design and Analysis

In this study we are investigating college student drinking and two exploratory measures of extension along with two exploratory measures of differentiation. In order to test hypotheses relating drinking score to high and low levels of differentiation and extension, as well as their interaction and the effect of sex, an analysis of variance design was used. The assumption was that greater mean alcohol use was associated with both low extension and low differentiation factor levels, and that men would show greater mean alcohol use than women. In order to test hypotheses relating differentiation and extension to categories of drinking pattern or to discrete categories of drinking, discriminant analysis was used. The assumption was that students belonging to different drinking patterns or to different drinking category groups could be distinguished by their differentiation and extension scores.

## Analysis of Variance

The analysis of variance (ANOVA) is concerned with the analysis of variation about means. ANOVA consists of partitioning the total variation present in the data set into appropriate components of interest and error. In order to test for effects of high and low extension and of high and low differentiation, the medians of these respective scores were used to divide subjects into above the median (high) and below the median (low) components.

Discriminant Analysis

"Discriminant analysis begins with the desire to statistically distinguish between two or more groups of cases. These 'groups' are defined by the particular research situation" (Nie, Hull, Jenkins, Steinbrenner & Bent, 1975, p. 435).

The differentiation and extension measures, both primary and secondary, are the variables on which the quantity-pattern groups and the drinking category groups are hypothesized to differ. In discriminant analysis, these variables, the discriminating variables as they are called, are linearly combined into "discriminant functions". Mathematically, the objective of discriminant analysis "is to weigh and linearly combine the discriminating variables in some fashion so that the groups are forced to be as statistically distinct as possible" (Nie, et al., 1975, p. 435). Once the discriminant functions are derived, this technique provides several means for determining their significance, number, and importance.

Nunnally (1978) in discussing the multiple discriminant function (MDF) states that, "both conceptually and mathematically the MDF constitutes a powerful tool which has not been employed nearly as much as it should have been in the behavioral sciences" (p. 464). His view is that in applied problems discriminant analysis is more fruitfully used in the areas of noncognitive attributes such as

interests or with personality characteristics and attitudes. Such is the case in the present study.

Statistical Treatment

As shown in Appendix B, the number of nonwhite, non-American born respondents is small. In order to allow for a more clear-cut presentation of results these cases were excluded from the statistical analyses.

Since the raw drinking scores were highly skewed, the transformation, fourth root of the drinking score, was used to bring about a good approximation to normality. A 2 X 2 X 2 factorial unequal cell analysis of variance design for the three independent variables of differentiation (high, low), extension (high, low), and sex (male, female) was used with the dependent variable fourth root of drinking score. A separate ANOVA was done for the primary measures of extension and differentiation and for the secondary measures of extension and differentiation. All main effects and interactions were tested with the residual error term.

The four variables used for the set of discriminating variables in the present analysis are the two measures of differentiation and the two measures of extension.

This present study has been primarily concerned with college student drinkers. Discriminant analysis was used to see if measures of differentiation and extension could distinguish: (1) drinking pattern categories, and (2) drinking

categories (light, moderate, heavy). Additionally, discriminant analysis was used to look at possible distinctions among abstainers, light drinkers, moderate drinkers, and heavy drinkers with regard to measures of differentiation and extension.

The analyses of variance, discriminant analyses, and reliability computations were performed by using the Statistical Package for the Social Sciences (Nie, et al., 1975) on the CDC 6500 computer system at Michigan State University.

## Statement of Hypotheses

The statistical treatment dealt with seven hypotheses. Restated, these hypotheses were:

Hypothesis 1. Among subjects who drink alcoholic beverages, the mean drinking score will be lower for those classified high in differentiation compared with those classified low in differentiation.

Hypothesis 2. Among subjects who drink alcoholic beverages, the mean drinking score will be lower for those classified high in extension compared with those classified low in extension.

Hypothesis 3. Among subjects who drink alcoholic beverages, the mean drinking score will be lowest for those classified high in both differentiation and extension compared with all other classifications.

Hypothesis 4. Among subjects who drink alcoholic beverages, females will have lower mean drinking scores compared with males.

Hypothesis 5. Among subjects who drink alcoholic beverages, differentiation and extension measures will discriminate among groups identified by drinking pattern categories.

Hypothesis 6. Among subjects who drink alcoholic beverages, differentiation and extension measures will discriminate among groups identified by drinking category (light, moderate, heavy).

Hypothesis 7. Differentiation and extension measures will discriminate among groups identified as abstainers, light drinkers, moderate drinkers, and heavy drinkers.

# RESULTS

The primary purpose of this study was to test assumptions relating college student drinking and measures of differentiation and extension. The hypotheses that a high level of differentiation and a high level of extension would be related to lower drinking scores were tested using analysis of variance (ANOVA). The ANOVA design also provided for testing interactions as well as the influence of sex differences in alcohol use.

An examination of the ability of differentiation and extension variables to "discriminate" between groups identified by drinking pattern and drinking category was carried out using multiple discriminant analysis. Along with the derivation of the discriminant functions, multiple discriminant analysis provides tests for statistically determining the success with which the variables used actually discriminate.

Additionally, a look at aspects of the data intended to articulate the sex difference findings is provided. This information will, hopefully, round out the picture of college student drinking drawn from the present investigation.

Drinking Score, Primary Measures of Differentiation and Extension, and Sex

A 2 X 2 X 2 factorial unequal cell analysis of variance with differentiation (high, low), extension (high, low) and sex as the independent variables was used to test hypotheses one through four on the primary differentiation and extension measure. The transformation fourth root of drinking score was used as the dependent measure. Table 2 shows the means and standard deviations for subject's raw drinking score by level (high, low) of the primary measures of differentiation and extension and sex. The analysis of variance summary is displayed in Table 3.

TABLE 2

Means and Standard Deviations of Raw Drinking Score by Primary Measures[a] of Differentiation and Extension and Sex

| | | Mean | SD | N |
|---|---|---|---|---|
| Sex | Female | .69 | .74 | 203 |
| | Male | 1.05 | 1.31 | 173 |
| $Differentiation_p$ | Low | .83 | 1.03 | 199 |
| | High | .88 | 1.09 | 177 |
| $Extension_p$ | Low | .97 | 1.21 | 216 |
| | High | .69 | .78 | 160 |
| Total | | .85 | 1.06 | 376 |

[a]Subscript p in table indicates primary measure.

TABLE 3

Analysis of Variance Summary of Fourth Root of Drinking Score for Primary Measures[a] of Differentiation and Extension and Sex

| Source | df | MS | F |
|---|---|---|---|
| $Differentiation_p$ | 1 | .002 | .039 |
| $Extension_p$ | 1 | .290 | 4.927* |
| Sex | 1 | .419 | 7.120** |
| $Differentiation_p$ x $Extension_p$ | 1 | .005 | .079 |
| $Differentiation_p$ x Sex | 1 | .196 | 3.339 |
| $Extension_p$ x Sex | 1 | .000 | .005 |
| $Differentiation_p$ x $Extension_p$ x Sex | 1 | .035 | .600 |
| Error | 368 | .059 | |

[a]Subscript p in table indicates primary measure.
*Probability less than .05
**Probability less than .01

The analysis of variance disclosed significant main effects for extension and sex. None of the interactions (including hypothesis three) were significant. Nor was the effect of differentiation (hypothesis one) significant. Hypothesis two was confirmed. Those subjects classified high on the primary measure of extension (based on the people orientation scale from Attitudes Toward Leadership) had significantly lower mean drinking scores than those subjects classified as low on extension. Hypothesis four was also confirmed; men having a highly significant greater mean

drinking score than women. These results support the notion that greater drinking is associated with a low level of extension. The results also support the commonly held view that on the average, men drink more than women.

Drinking Score, Secondary Measures of Differentiation and Extension, and Sex

This examination of the secondary measures of differentiation (high, low), extension (high, low), and sex employed a 2 X 2 X 2 factorial unequal cell analysis of variance to test hypotheses one through four. The transformation fourth root of drinking score was used as the dependent variable. Table 4 shows the raw drinking score means by level (high, low) of the secondary measures of differentiation and extension and sex. The analysis of variance summary displayed in Table 5 reveals a significant main effect for sex only. None of the other main effects or interactions reach significance (hypotheses one through three). Hypothesis four, that men have higher mean drinking scores than women, is again confirmed.

Pattern of Drinking

The Quantity-Pattern index provides a four point ordered scale that reflects a subject's pattern of heavy drinking. These four pattern groups (A, B, C, D) can be characterized as follows: A = null, B = slight, C = moderate, and D = a pronounced pattern of heavy drinking. Discriminant

TABLE 4

Means and Standard Deviations of Raw Drinking Score by Secondary Measures[a] of Differentiation and Extension and Sex

| | | Mean | SD | N |
|---|---|---|---|---|
| Sex | Female | .69 | .74 | 203 |
| | Male | 1.05 | 1.31 | 173 |
| $Differentiation_s$ | Low | .77 | .99 | 209 |
| | High | .96 | 1.13 | 167 |
| $Extension_s$ | Low | .95 | 1.11 | 188 |
| | High | .76 | .99 | 188 |
| Total | | .85 | 1.06 | 376 |

[a]Subscript s in table indicates secondary measure.

analysis was used to determine whether, for drinking subjects, the four pattern groups differ with regard to differentiation and extension (hypothesis five). As significant sex differences in drinking were shown above (hypothesis four), all discriminant analyses were carried out for males and females separately.

The means and standard deviations, for male subjects, of the primary and secondary differentiation and extension scores for the drinking pattern (Q-P Index) categories are presented in Table 6. The discriminant analysis of male subjects for the differentiation and extension variables and the drinking pattern groups is shown in Table 7. Since there are four groups, it is possible to derive three

TABLE 5

Analysis of Variance Summary of Fourth Root of Drinking Score for Secondary Measures[a] of Differentiation and Extension and Sex

| Source | df | MS | F |
|---|---|---|---|
| Differentiation$_s$ | 1 | .167 | 2.849 |
| Extension$_s$ | 1 | .047 | .799 |
| Sex | 1 | .370 | 6.292* |
| Differentiation$_s$ x Extension$_s$ | 1 | .088 | 1.505 |
| Differentiation$_s$ x Sex | 1 | .061 | 1.044 |
| Extension$_s$ x Sex | 1 | .015 | .249 |
| Differentiation$_s$ x Extension$_s$ x Sex | 1 | .079 | 1.348 |
| Error | 368 | .059 | |

[a]Subscript s in table indicates secondary measure.
*Probability less than .01

discriminant functions. As each function is derived, starting with no (zero) functions, Wilks' lambda is calculated. Wilks' lambda can be used to test for the significance of discriminating information still remaining in the original variables and not yet removed by the discriminating functions. The larger the Wilks' lambda, the less information residual. Lambda can be transformed into chi-square for a statistical test of significance. The eigenvalues, and their associated canonical correlations computed in the derivation of the discriminant functions, signify the relative capability of each function to separate the groups.

TABLE 6

Means and Standard Deviations of Males on Primary and Secondary Measures[a] of Differentiation and Extension for Drinking Pattern (Q-P Index) Categories

| Drinking Pattern | $Differentiation_p$ | | $Extension_p$ | | $Differentiation_s$ | | $Extension_s$ | | N |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | |
| A | 8.40 | 3.79 | 9.96 | 2.78 | 10.80 | 3.66 | .95 | 8.01 | 25 |
| B | 7.63 | 3.66 | 9.25 | 4.59 | 9.25 | 3.49 | .62 | 7.77 | 8 |
| C | 8.56 | 3.59 | 8.80 | 3.18 | 11.29 | 3.08 | 1.29 | 6.37 | 45 |
| D | 8.74 | 3.13 | 8.05 | 3.19 | 11.71 | 3.06 | .89 | 7.21 | 95 |

[a]subscript p indicates primary measure; subscript s indicates secondary measure.

TABLE 7

Discriminant Analysis of Primary and Secondary Measures of Differentiation and Extension for Drinking Pattern (Q-P Index) Categories (Male Subjects)

| Discriminant Function | Eigenvalue | Canonical Correlation | Functions Derived | Wilks' lambda | df | Chi-Square |
|---|---|---|---|---|---|---|
| 1 | .0779 | .27 | 0 | .914 | 12 | 15.02[a] |
| 2 | .0139 | .12 | 1 | .986 | 6 | 2.41[a] |
| 3 | .0005 | .02 | 2 | .999 | 2 | .09[a] |

[a]Not significant

Three discriminant functions were calculated. None had an eigenvalue greater than .07 and none reached statistical significance. Hypothesis five was not confirmed for males. No difference was found among drinking pattern groups.

Table 8 shows the female means and standard deviations of the primary and secondary differentiation and extension scores for the drinking pattern (Q-P Index) categories. The discriminant analysis of these variables for females is displayed in Table 9. The eigenvalues are small for the discriminant analysis of females and drinking pattern. The discriminant functions did not achieve statistical significance and hypothesis five for females was not confirmed.

Drinking Category: Light, Moderate, Heavy

A discriminant analysis for the drinking categories (light, moderate, heavy) was carried out using the primary and secondary measures of differentiation and extension as the discriminating variables in order to test hypothesis six. Table 10 presents the means and standard deviations for males. The discriminant analysis for males is shown in Table 11. The discriminant functions are not statistically significant and hypothesis six is not upheld for males.

The means and standard deviations for females are presented in Table 12. The discriminant analysis for females is exhibited in Table 13. The eigenvalues associated with

TABLE 8

Means and Standard Deviations of Females on Primary and Secondary Measures[a] of Differentiation and Extension for Drinking Pattern (Q-P Index) Categories

| Drinking Pattern | $Differentiation_p$ | | $Extension_p$ | | $Differentiation_s$ | | $Extension_s$ | | N |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | |
| A | 8.91 | 2.55 | 8.89 | 3.06 | 10.65 | 3.20 | 2.59 | 7.47 | 54 |
| B | 8.05 | 3.23 | 9.90 | 3.40 | 11.62 | 2.75 | 5.48 | 6.77 | 21 |
| C | 6.92 | 3.11 | 9.22 | 3.44 | 11.08 | 2.98 | 4.58 | 7.22 | 51 |
| D | 8.03 | 3.11 | 8.77 | 2.53 | 10.95 | 2.95 | 3.10 | 8.59 | 77 |

[a]subscript p indicates primary measure; subscript s indicates secondary measure.

TABLE 9

Discriminant Analysis of Primary and Secondary Measures of Differentiation and Extension for Drinking Pattern (Q-P Index) Categories (Female Subjects)

| Discriminant Function | Eigenvalue | Canonical Correlation | Functions Derived | Wilks' lambda | df | Chi-Square |
|---|---|---|---|---|---|---|
| 1 | .0744 | .26 | 0 | .903 | 12 | 20.24[a] |
| 2 | .0295 | .17 | 1 | .969 | 6 | 6.04[a] |
| 3 | .0014 | .04 | 2 | .999 | 2 | .28[a] |

[a]Not significant

TABLE 10

Means and Standard Deviations of Males on Primary and Secondary Measures[a] of Differentiation and Extension for Drinking Category (Light, Moderate, Heavy)

| Drinking Category | $Differentiation_p$ | | $Extension_p$ | | $Differentiation_s$ | | $Extension_s$ | | N |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | |
| Light | 8.73 | 3.31 | 9.08 | 3.31 | 10.69 | 3.45 | .47 | 7.56 | 59 |
| Moderate | 8.23 | 3.44 | 8.47 | 3.25 | 11.47 | 2.99 | 1.61 | 6.74 | 93 |
| Heavy | 9.57 | 3.04 | 7.62 | 2.92 | 12.67 | 3.01 | - .22 | 7.29 | 21 |

[a]subscript p indicates primary measure; subscript s indicates secondary measure

TABLE 11

Discriminant Analysis of Primary and Secondary Measures of Differentiation and Extension for Drinking Category: Light, Moderate, Heavy (Male Subjects)

| Discriminant Function | Eigenvalue | Canonical Correlation | Functions Derived | Wilks' lambda | df | Chi-Square |
|---|---|---|---|---|---|---|
| 1 | .0672 | .25 | 0 | .916 | 8 | 14.77[a] |
| 2 | .0229 | .15 | 1 | .978 | 3 | 3.82[a] |

[a]Not significant

TABLE 12

Means and Standard Deviations of Females on Primary and Secondary Measures[a] of Differentiation and Extension for Drinking Category (Light, Moderate, Heavy)

| Drinking Category | $Differentiation_p$ | | $Extension_p$ | | $Differentiation_s$ | | $Extension_s$ | | N |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | |
| Light | 8.29 | 2.81 | 9.15 | 3.32 | 10.79 | 3.09 | 4.02 | 7.67 | 81 |
| Moderate | 7.77 | 3.16 | 8.96 | 2.83 | 11.13 | 2.98 | 3.31 | 8.10 | 112 |
| Heavy | 7.90 | 3.73 | 8.90 | 2.51 | 10.70 | 2.54 | 3.09 | 5.34 | 10 |

[a]Subscript p indicates primary measure; subscript s indicates secondary measure

TABLE 13

Discriminant Analysis of Primary and Secondary Measures of Differentiation and Extension for Drinking Category: Light, Moderate, Heavy (Female Subjects)

| Discriminant Function | Eigenvalue | Canonical Correlation | Functions Derived | Wilks' lambda | df | Chi-Square |
|---|---|---|---|---|---|---|
| 1 | .0146 | .12 | 0 | .985 | 8 | 3.09[a] |
| 2 | .0011 | .03 | 1 | .999 | 3 | .23[a] |

[a]Not significant

the discriminant functions are quite small. The chi-square used to statistically test the discriminant functions is not significant and hypothesis six is not substantiated for females.

Drinking Classification: Abstain, Light, Moderate, Heavy

This investigation has focused on college student drinkers. Discriminant analysis was also applied to a comparison of abstainers and drinker groups with respect to the differentiation and extension variables in order to test hypothesis seven. The means and standard deviations, for male subjects, of the primary and secondary differentiation and extension scores for the abstainer, light drinker, moderate drinker, and heavy drinker classifications are given in Table 14. The discriminant analysis for males is displayed in Table 15. The first discriminant function, as indicated by a significant chi-square (Table 15), was able to distinguish the drinking classification groups for males. The remaining two functions are not statistically significant.

Table 16 shows the standardized discriminant function coefficients for the first discriminant function's associated variables for males. The size of each variable's coefficient indicates the relative contribution to that function. The sign represents a positive or negative contribution by the variable. It can be seen from Table 16 that

TABLE 14

Means and Standard Deviations of Males on Primary and Secondary Measures[a] of Differentiation and Extension for Drinking Classification: Abstain, Light, Moderate, Heavy

| Drinking Class. | $Differentiation_p$ | | $Extension_p$ | | $Differentiation_s$ | | $Extension_s$ | | N |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | |
| Abstain | 5.57 | 4.04 | 11.14 | 5.21 | 10.71 | 3.30 | 10.79 | 3.95 | 7 |
| Light | 8.73 | 3.31 | 9.08 | 3.31 | 10.69 | 3.45 | .47 | 7.56 | 59 |
| Moderate | 8.28 | 3.44 | 8.47 | 3.25 | 11.47 | 2.99 | 1.61 | 6.74 | 93 |
| Heavy | 9.57 | 3.04 | 7.62 | 2.92 | 12.67 | 3.01 | - .22 | 7.29 | 21 |

[a]Subscript p indicates primary measure; subscript s indicates secondary measure

TABLE 15

Discriminant Analysis of Primary and Secondary Measures of Differentiation and Extension for Drinking Classification: Abstain, Light, Moderate, Heavy (Male Subjects)

| Discriminant Function | Eigenvalue | Canonical Correlation | Functions Derived | Wilks' lambda | df | Chi-Square |
|---|---|---|---|---|---|---|
| 1 | .1215 | .33 | 0 | .833 | 12 | 31.91* |
| 2 | .0639 | .25 | 1 | .935 | 6 | 11.85 |
| 3 | .0058 | .08 | 2 | .994 | 2 | 1.01 |

*Probability less than .001

TABLE 16

Standardized Discriminant Function Coefficients for Function One and Associated Variables[a] of the Drinking Classification Analysis for Males

| Discriminant Variable | Function Coefficient |
|---|---|
| $Differentiation_p$ | -.45 |
| $Extension_p$ | .22 |
| $Differentiation_s$ | .08 |
| $Extension_s$ | .82 |

[a]Subscript p indicates primary measure
Subscript s indicates secondary measure

this discriminant function is essentially bipolar with $extension_s$ at the positive pole and $differentiation_p$ at the negative pole.

Further clarification of the significant discriminant analysis for drinking classification of males is disclosed in the significant univariate $F$ ratios for $extension_s$ and $differentiation_p$. The $F$ test of $extension_s$ (based on the Lov scale from the Interpersonal Check List) was highly significant ($F = 4.92$, $df = 3$ and $176$, $p < .01$). Use of the Tukey(a) procedure (Winer, 1971, p. 198), for comparing all possible pairs of group means for $extension_s$, indicated that abstainers ($M = 10.79$) are significantly distinct from

the homogeneous grouping of light drinkers ($\underline{M}$ = .47), moderate drinkers ($\underline{M}$ = 1.61), and heavy drinkers ($\underline{M}$ = -.22). The $\underline{F}$ test of differentiation$_p$ (based on the differentiated role scale from Attitudes Toward Leadership) also was significant ($\underline{F}$ = 2.68, $\underline{df}$ = 3 and 176, $\underline{p}$ < .05). Use of the Tukey(a) procedure, in comparing all possible group mean pairs for differentiation$_p$, indicated that the significant difference subset was between abstainers ($\underline{M}$ = 5.57) and heavy drinkers ($\underline{M}$ = 9.57). Hypothesis seven was substantially confirmed for males. Figure 2 shows the group centroid (the most typical location of a subject from that group in the discriminant function space) for the four groups of male subjects. The abstainer's centroid stands off to one side, while the centroids of the drinker groups cluster near each other.

The means and standard deviations for females on the primary and secondary measures of differentiation and extension for drinking classification are presented in Table 17. The discriminant analysis is displayed in Table 18. The eigenvalues were small and none of the discriminant functions were significant. Hypothesis seven is not established for females.


Figure 2. Centroid coordinates for significant discriminant function for males on drinking classification. (A=abstain, L=light, M=moderate, H=heavy)

TABLE 17

Means and Standard Deviations of Females on Primary and Secondary Measures[a] of Differentiation and Extension for Drinking Classification: Abstain, Light, Moderate, Heavy

| Drinking Class. | $Differentiation_p$ | | $Extension_p$ | | $Differentiation_s$ | | $Extension_s$ | | N |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD | |
| Abstain | 8.38 | 3.03 | 8.06 | 3.43 | 10.50 | 2.97 | 4.73 | 10.20 | 16 |
| Light | 8.29 | 2.81 | 9.15 | 3.32 | 10.79 | 3.09 | 4.02 | 7.67 | 81 |
| Moderate | 7.77 | 3.16 | 8.96 | 2.83 | 11.13 | 2.98 | 3.31 | 8.10 | 112 |
| Heavy | 7.90 | 3.73 | 8.90 | 2.51 | 10.70 | 2.54 | 3.09 | 5.34 | 10 |

[a]Subscript p indicates primary measure; subscript s indicates secondary measure

TABLE 18

Discriminant Analysis of Primary and Secondary Measures of Differentiation and Extension for Drinking Classification: Abstain, Light, Moderate, Heavy (Female Subjects)

| Discriminant Function | Eigenvalue | Canonical Correlation | Functions Derived | Wilks' lambda | df | Chi-Square |
|---|---|---|---|---|---|---|
| 1 | .0135 | .12 | 0 | .976 | 12 | 5.16[a] |
| 2 | .0098 | .09 | 1 | .989 | 6 | 2.29[a] |
| 3 | .0009 | .03 | 2 | .999 | 2 | .21[a] |

[a]Not significant

## Additional Results Concerning Sex Differences

As noted above, for the population used in the statistical treatment, sex differences are significant. This difference in mean drinking score for men and women is due to the men's preference for beer. The men's drinking scores ($N$ = 173) for each beverage are .63 for beer, .13 for wine, and .28 for liquor. The women's drinking scores ($N$ = 203) for each beverage are .25 for beer, .15 for wine, and .29 for liquor. These male-female drinking differences are notable in the population which includes abstainers ($N$ = 180 for males; $N$ = 219 for females). Here, 12% of men and 5% of women are heavy drinkers, whereas, 4% of men and 7% of women are abstainers. In addition, for this population and drinking pattern, 32% of women and 18% of men show the null pattern, whereas, 35% of women and 53% of men show the pronounced pattern of heavy drinking.

## Summary

A low level of extension was found to be related to greater drinking score for the primary measure but not for the secondary measure. Levels of differentiation for neither the primary nor the secondary measures of differentiation were found to be related to drinking score. Men showed significantly greater drinking than women.

A separate discriminant analysis of drinking pattern groups and of drinking category (light, moderate, heavy) groups failed to disclose a distinction based on the measures of differentiation or extension. The discriminant analysis of drinking classification groupings (abstain, light, moderate, heavy) did indicate however, that for males a significant distinction did exist between abstainers and drinkers on extension$_s$ (the Lov scale) and between abstainers and heavy drinkers on differentiation$_p$ (the differentiated role scale).

# DISCUSSION

The results, overall, give significant support to the relationship of measures of extension to drinking by college students. A summary of the significance of hypotheses tested and of the direction of findings is presented in Table 19. The particular results with respect to specific hypotheses and related findings are discussed in the following sections.

## Differentiation and Drinking

The association of poor differentiation with greater alcohol use seemed a strong hypothesis. Witkin, et al. (1954) and many subsequent investigators, found alcoholics to be field dependent, and thus less differentiated than nonalcoholics. Wegner (1971) showed that college students who were field independent also assumed dissimilarity to most people. In the present study, however, differentiation levels were not found to be significantly related to drinking score. Hypothesis one was not confirmed. Moreover, the mean drinking scores associated with the analyses of variance, for both the primary and secondary measures, while not significant, are opposite to the hypothesized direction.

TABLE 19

Summary of Hypotheses Tested

| | Significance |
|---|---|
| Hypothesis 1: High differentiation is associated with less drinking. | |
| Primary Measure (Differentiated Role) | -? |
| Secondary Measure (Preference Inventory) | -? |
| Hypothesis 2: High extension is associated with less drinking. | |
| Primary Measure (People Orientation) | ++ |
| Secondary Measure (Lov Scale) | +? |
| Hypothesis 3: High differentiation and extension associated with least drinking. | |
| Primary Measure Interaction | -? |
| Secondary Measure Interaction | -? |
| Hypothesis 4: Males drink more than females. | +++ |
| Hypothesis 5: Drinking pattern groups differ. | |
| Males | ns |
| Females | ns |
| Hypothesis 6: Drinking category groups differ. | |
| Males | ns |
| Females | ns |
| Hypothesis 7: Drinking classification groups differ. | |
| Males | +++[a], --[b] |
| Females | ns |

NOTE: +++ = $p<.01$, and in hypothesized direction.
++ = $p<.05$, and in hypothesized direction.
+? = not significant, but in hypothesized direction.
-- = $p<.05$, but opposite to hypothesized direction.
-? = not significant, but opposite to hypothesized direction.
ns = not significant

[a]For Lov scale.
[b]For Differentiated Role Scale.

That is, a high differentiation level is associated with a greater mean drinking score.

It should be pointed out that studies based on the Witkin model used variations of the Rod and Frame Test and that Wegner used a test of embedded figures. Both are tests involving visual perception. The present study used questionnaire based measures of role differentiation and assumed dissimilarity on the assumption that these measures would be congruent with Witkin's conception of psychological differentiation. This assumption remains tentative and deserves further investigation.

The present study involved a look at normal drinking practices. Perhaps college student drinkers do not drink so much as to show characteristics of differentiation associated with that kind of drinking called alcoholism. The results do suggest a possible connection between a sense of difference from others and greater drinking. Further research is needed to determine if this "sense of difference" is also a factor in the development of problem drinking.

Extension and Drinking

Subjects classified high in extension, on the primary measure, had significantly lower mean drinking scores compared with subjects classified low. Hypothesis two was accepted for the primary but not for the secondary analysis of variance. For this sample of drinkers, those high on the

people orientation scale drank significantly less than those classified low on people orientation. Those subjects classified high on the Lov scale also drank less than those classified low, but not significantly so.

A prominent reason given for drinking is for ease of social mixing. Those who already experience extension, people orientation, a connection with others, may have less need to use drink to be at ease with others, and may drink less when they do drink for social-facilitating reasons.

## Differentiation-Extension and Drinking

There was no significant interaction between any of the measures of extension and differentiation. Hypothesis three was not accepted. As noted above, the relating of differentiation to alcohol use requires a further look before its connection with extension can be more properly assessed. It is of interest to note, however, that in both the primary and secondary analyses, the highest mean drinking scores were seen for subjects high in level of differentiation and low in level of extension, whereas the lowest mean drinking scores were seen for subjects low in level of differentiation and high in level of extension.

## Sex Differences and Comparisons

Hypothesis four was confirmed. In a not surprising result, men drank significantly more than women.

This present sample of college students showed a very high percentage of men and women drinkers compared with several previous surveys of drinking by college students. Straus and Bacon (1953) found that 79% of men and 61% of women drank. Hanson (1974), reporting on a 1971 survey, found that 80% of men and 73% of women used alcohol. Engs (1977) found that 82% of men and 75% of women were drinkers, with men drinking significantly greater amounts of alcoholic beverages than women; notably beer. In the present survey, for subjects with complete data, 95% of the men ($N$ = 211) and 93% of the women ($N$ = 262) reported drinking. This increase, in the percentages of men and women who drink in college, shows the women now nearing the percentage of men.

The fondness for drink of this present sample of college students is shown in the absolute alcohol drinking scores also. Jessor, Carman and Grossman (1968) in their study of college student drinking reported an absolute alcohol score of .72 for men and .36 for women. Hanson (1977), using the Jessor measure of absolute alcohol, surveyed colleges in 1971 and in 1975. The total sample absolute alcohol score reported was .51 in 1971 and .46 in 1975. For the present sample the absolute alcohol score, for subjects with complete data, was 1.12 for men ($N$ = 211), .60 for women ($N$ = 262), and .83 for the total sample.

The present data are congruent with ongoing change in the drinking behavior of American women. It has been suggested by Parker (1975) that this noticeable increase in drinking among women is linked to the rejection of traditional femininity. Wilsnack and Wilsnack (1978) talk about a symbolic use of alcohol by women, and hence, an association between more widespread drinking and women's liberation. Keil (1978) points out that women are moving into social situations and roles in which they are expected to be drinkers. It is not surprising that college women may be among the first to reflect these kinds of social changes in their drinking behavior.

While college women, in the present sample at least, have near equality with college men in proportion of drinkers, still there remains a rather pronounced difference in the amount of alcohol men consume as compared with women. A common reason given for the difference in male and female drinking is the normative influence for women of restraint (e.g., Jessor, et al. 1968). In the present data women show the null pattern of drinking approximately twice as much as men. Whereas, men show the heavy pattern of drinking approaching nearly twice that of women. This suggests that, with regard to the average frequency of heavy drinking, the normative influence of restraint may still be operating.

In interpreting sex differences in alcohol consumption a question arises concerning average differences in male and female body weight. Orford, Waller, and Peto (1974) indicate that this weight difference would be largely offset if women drank more slowly. They present evidence that this may be the case, remarking that "it is impossible to judge to what extent survey estimates of quantities of alcohol consumed should be adjusted for body weight, or indeed whether they should be adjusted at all" (p. 1364). For the present study, we will assume that the substantial sex difference in amount of absolute alcohol imbibed is too large to be explained in terms of body weight differences. It should be pointed out that these present survey data were collected when the legal age of drinking in Michigan was eighteen years old, and drinking alcohol in residence halls was not proscribed for the vast majority of students.

Drinking Pattern

The present study used a drinking pattern index devised by Little, et al. (1977) as an adjunct to Jessor's aggregate measure of drinking. The differentiation and extension measures, however, did not significantly distinguish between these drinking pattern groups. Hypothesis five was rejected for the male and the female analyses.

Fillmore (1975) has demonstrated the aptness of a pattern of drinking measure in predicting drinking problems

for both men and women, however, further research is needed to see if Little's pattern index will prove a useful measure of drinking variability for different populations.

Drinking Category

The drinking categories, light, moderate, and heavy, did not show significant differences on the differentiation or on the extension measures. Hypothesis six was rejected for both men and women.

For the present sample of college student drinkers, neither the designation by pattern nor by category of drinking proved adequate to establishing differences in differentiation or extension.

Drinking Classification

Hypothesis seven was confirmed for males. The discriminant analysis for males derived a single significant discriminant function. This function appears to be bipolar (Table 16), and its dominant characteristic is $extension_s$ (from the Lov scale). We can also see from Table 16 that $extension_s$ is about twice as important on this function as $differentiation_p$ (from differentiated role). The univariate F ratios indicate that the group distinctions are between abstainers and drinkers or abstainers and heavy drinkers. Moreover, the group centroids for this significant function show clearly that this function separates abstainers from drinkers.

The drinking classifications did not distinguish the females on the basis of differentiation or extension. Hypothesis seven was not confirmed for females. Extension$_s$ for women, however, showed a non significant trend from highest Lov score for abstainers to lowest Lov score for heavy drinkers. The women's Lov scores for all classifications were higher than those for men with the impressive exception of male abstainers.

Extension - Differentiation and Drinking

The association of a high level of extension$_s$, based on the people orientation scale, with significantly less drinking is in accord with the notion that social-interactive drinking is moderate and mature (Fallding and Miles, 1974; Jung, 1977). Those persons with a high people orientation may be able to enjoy an ease of social interaction that those persons less people oriented look to alcohol to provide. This is not to imply that the amount of drinking by the low extension$_p$ (people orientation) subjects is indicative of problem drinking. That issue requires more far reaching inquiry.

Extension$_s$ (based on the Lov scale) predominates in distinguishing male abstainers from all male drinkers. This result, albeit based on only seven cases, is so striking as to merit study with other and different populations. Lolli (1956) speaks of love as a drive toward the unity of

persons, and he sees alcohol as providing a short-lived, illusory, version of this unity. Perhaps this small sample of men is an indication that with a high degree of extension, of love, of felt unity, alcohol is not needed to fulfill this function.

This group of male abstainers was dissimilar from the heavy male drinkers in differentiation$_p$ (based on the differentiated role scale). This dissimilarity, however, was not in the expected direction. The male abstainers had a significantly lower mean differentiation$_p$ score than the male heavy drinkers. That is to say, the heavy drinking men said a leader should act in a differentiated way from the work group. Whereas, the abstainers said a leader should act in a way more like the work group. Here again can be seem implications of connectedness, relatedness and unity on the part of abstainers. This deserves to be further looked at in the study of drinking behavior, especially the drinking behavior of men.

## Implications of the Present Research

This present study of drinking grew out of an interest in the etiology of alcoholism. It seemed to this present writer that some people in the process of their development could get distressingly distant from others. The yearning for contact with others was strong, but the fear of contact was somehow greater. Alcohol, that readily available social

lubricant par excellence, would allow one to extend oneself out to others.

Smith's theory expressed the importance of this extension requirement. The conceptualization of differentiation proposed by Smith's theory also seemed to fit the notion that alcoholics lacked an appropriately distinct interpersonal awareness. The research literature supported these formulations of extension and differentiation. Hypotheses regarding high and low levels of differentiation and extension were formed with respect to drinkers in general and college student drinkers in particular.

The results obtained from this study lend support to the view that persons who evidently have a greater orientation toward others drink less. The results somewhat suggest that those persons who see themselves as not very different from others also drink less. It is here implied that men, in particular, who seek contact with others yet see themselves as different from others, may use alcohol as a way of diminishing this felt distance and difference.

## Reformulation of the Composite Theory

A reformulation of the composite theory is suggested in light of the present findings. It appears that differentiation-extension may be better represented as a bipolar function, conceptualized as a dimension of relatedness. One pole (extension) may be seen as standing for a

loving, personal orientation toward others. The other pole (negative of differentiation) may be seen as involving a sense of not feeling different from others. This interpretation of differentiation-extension as a dimension of relatedness may be characterized as liking others and feeling that one is like others.

The implication from the present study is that, at least for men, this differentiation-extension dimension is associated with drinking behavior. And that men, in particular, who are "low" in this relatedness dimension may use alcohol as one means of trying to experience it.

## Alcoholics-Anonymous Therapy and the Reformulated Composite Theory

The reformulated composite theory would seem to fit the approach to therapy used by Alcoholics-Anonymous in its treatment program. Alcoholics-Anonymous fosters a loving, caring, personal orientation of the members toward one another, and at the same time provides social acceptance to counter the sense of difference from others that the alcoholic had as a drinker and now has as an abstainer. It may be, as Heather, Edwards and Hore (1975) suggest, that "the social reinforcement provided by A.A. enables the recovered alcoholic to see himself as respectable though he deviates from social norms in virtue of his abstinence" (p. 1252).

Recommendations and Conclusions

It would be interesting to look again at drinking practices in campus residence halls now that the legal age for drinking has been raised from eighteen to twenty-one years. Also, a look at drinking and differentiation and extension in varied populations would be valuable. A high school population, a general adult population, and, in particular, problem drinkers and alcoholics deserve investigation in terms of the reformulated composite theory. Longitudinal studies would permit the changing aspects of differentiation and extension and drinking behavior to be better understood.

The Pattern Index, while not showing significant outcome in this study, may be useful in studies of problem and non-problem drinkers. This pattern measure proposed by Little and her colleagues merits additional exploration.

The use of alcohol and its related behaviors is associated in complexity with other aspects of a person's personality, social environment, and developmental history. The present treatise has attempted to address only a small part of this complexity. Long term studies are needed to fully identify those early developmental tendencies that lead to later drinking behaviors.

# APPENDICES

APPENDIX A

## STUDENT SURVEY ON ATTITUDES AND DRINKING

### DIRECTIONS

**General Information**

This booklet contains statements of how people view themselves, leaders, and statements about drinking behavior. The answers you provide to the following questions are helpful for the study of college students' attitudes and drinking behavior.

Your participation in this project is completely voluntary; you have the right to decline if you wish. If you do choose to begin and find the questions objectionable, you may discontinue at any time; or if you dislike answering a particular question, you may omit it. However, you should know that all your answers are completely confidential and anonymous. For example, the penciled number in the student number box can only be used to match the two separate answer sheets. If you do agree to cooperate, I would appreciate your answering all questions to the best of your ability.

**General Instructions**

1. Mark your answers on the answer sheets using a 2 or 2½ lead pencil. Fill in the space provided with a solid mark. Note that the numbers on the answer sheets go from left to right across the page.

2. Answer questions 1 through 158 in the first half of the booklet on the Answer Sheet marked A. Answer the questions in the second half of the booklet numbered 1 through 53 on the Answer Sheet marked B.

3. Do not write your name or student number on the answer sheets or questionnaire. Please follow the specific directions given throughout the booklet. Erase completely any answer you wish to change.

4. Please return all materials: answer sheets and booklet.

## Preference Inventory

Answer the following 24 True-False statements in the way that best describes yourself. If the statement is true or mostly true about yourself, mark 1 on the answer sheet next to that statement number, if the statement is false or mostly false about yourself, mark 2 on the answer sheet next to that statement number. Use your A answer sheet.

1. I like to have people around me practically all of the time.
2. I always prefer to work with others.
3. I would rather listen to a story than tell one.
4. I am cautious about undertaking anything which may lead to humiliating experiences.
5. I am almost never embarrassed.
6. I am fairly easily moved to laughter or tears.
7. I am moderate in my tastes and sentiments.
8. I think much and speak little.
9. I have strong likes and dislikes.
10. It takes a great deal to make me emotional.
11. I become emotional fairly easily.
12. I have sometimes corrected others, not because they were wrong, but only because they irritated me.
13. I am mainly interested in ideas that are very practical.
14. I get an intense pleasure from just looking at a beautiful building.
15. I generally seek whatever makes me happy here and now.
16. I always keep control of myself in an emergency situation.
17. I find it rather hard to keep to a rigid routine.
18. It is necessary to retain the belief that God exists as a personal being.
19. In matters of conduct I conform very closely to custom.
20. The thought of God gives me a complete sense of security.
21. I control my sexual impulses by instituting prohibitions and restrictions.
22. Some of my friends think my ideas are a bit wild and impractical.
23. I am temperamentally more a skeptic than a believer.
24. The European attitude toward mistresses is more sensible than ours.

Go on to next page.

## Interpersonal Check List

Following is a list of 134 phrases which describe ways people may behave in relation to one another. If an item describes you, mark 1 for Yes, if an item does not describe you, mark 2 for No, at the item number on the answer sheet. Use your A answer sheet. Be sure to mark the right numbered item.

25. Able to give orders
26. Appreciative
27. Apologetic
28. Able to take care of self
29. Accepts advice readily
30. Able to doubt others
31. Affectionate and understanding
32. Acts important

33. Able to criticize self
34. Admires and imitates others
35. Agrees with everyone
36. Always ashamed of self
37. Very anxious to be approved of
38. Always giving advice
39. Bitter
40. Bighearted and unselfish

41. Boastful
42. Businesslike
43. Bossy
44. Can be frank and honest
45. Clinging vine
46. Can be strict if necessary
47. Considerate
48. Cold and unfeeling

49. Can complain if necessary
50. Cooperative
51. Complaining
52. Can be indifferent to others
53. Critical of others
54. Can be obedient
55. Cruel and unkind
56. Dependent

57. Dictatorial
58. Distrusts everybody
59. Dominating
60. Easily embarrassed
61. Eager to get along with others
62. Easily fooled
63. Egotistical and conceited
64. Easily led

65. Encouraging others
66. Enjoys taking care of others
67. Expects everyone to admire
68. Faithful follower
69. Frequently disappointed
70. Firm but just
71. Fond of everyone
72. Forceful

73. Friendly
74. Forgives anything
75. Frequently angry
76. Friendly all the time
77. Generous to a fault
78. Gives freely of self
79. Good leader
80. Grateful

81. Hard-boiled when necessary
82. Helpful
83. Hard-hearted
84. Hard to convince
85. Hot-tempered
86. Hard to impress
87. Impatient with other's mistakes
88. Independent

89. Irritable
90. Jealous
91. Kind and reassuring
92. Likes responsibility
93. Lacks self-confidence
94. Likes to compete with others
95. Lets others make decisions
96. Likes everybody

97. Likes to be taken care of
98. Loves everyone
99. Makes a good impression
100. Manages others
101. Meek
102. Modest
103. Hardly ever talks back
104. Often admired

Go on to next page

105. Obeys too willingly
106. Often gloomy
107. Outspoken
108. Overprotective of others
109. Often unfriendly
110. Oversympathetic
111. Often helped by others
112. Passive and unaggressive

113. Proud and self-satisfied
114. Always pleasant and agreeable
115. Resentful
116. Respected by others
117. Rebels against everything
118. Resents being bossed
119. Self-reliant and assertive
120. Sarcastic

121. Self-punishing
122. Self-confident
123. Self-seeking
124. Shrewd and calculating
125. Self-respecting
126. Shy
127. Sincere and devoted to friends
128. Selfish

129. Skeptical
130. Sociable and neighborly
131. Slow to forgive a wrong
132. Somewhat snobbish
133. Spineless
134. Stern but fair
135. Spoils people with kindness
136. Straightforward and direct

137. Stubborn
138. Suspicious
139. Too easily influenced by friends
140. Thinks only of self
141. Tender and soft-hearted
142. Timid
143. Too lenient with others
144. Touchy and easily hurt

145. Too willing to give to others
146. Tries to be too successful
147. Trusting and eager to please
148. Tries to comfort everyone
149. Usually gives in
150. Very respectful to authority
151. Wants everyone's love
152. Well thought of

153. Wants to be led
154. Will confide in everyone
155. Warm
156. Wants everyone to like
157. Will believe anyone
158. Well-behaved

You are through with your
A answer sheet.

Now get your B answer sheet, and

Go on to next page

## Attitudes Toward Leadership

Listed below are 32 pairs of statements. In each pair are two statements of things that a leader can do. Choose the one that you feel it is more important for a leader to do. If you feel that both alternatives are poor, choose the one you think is less poor. The same statement may appear more than once. Make your choice within the pair. Mark the alternative number you choose next to the number of the pair on the B answer sheet.

It is important for a leader:

1. (1) To make decisions independently of the group.
   (2) To really be a part of the work group.

2. (1) To let workers take time out from the monotony when they wish.
   (2) To allow workers to make decisions only when given explicit authority by the leader.

3. (1) To take an interest in the worker as a person.
   (2) To maintain definite standards of performance.

4. (1) To have the workers do their work the way they think is best.
   (2) To rule with a firm hand.

5. (1) To decide in detail how the work shall be done by the workers.
   (2) To let workers make decisions whenever they feel competent.

6. (1) To make it clear that the leader is in charge of the group.
   (2) To have workers settle by themselves most of their job problems.

7. (1) To have the workers settle by themselves most problems.
   (2) To have scheduled rest periods.

8. (1) To have the workers do their work the way they think is best.
   (2) To assign specific responsibilities and duties daily.

9. (1) To do the important jobs oneself.
   (2) To have workers take their rest periods when they wish.

10. (1) To feel the leader belongs in the group.
    (2) To reward the good workers.

11. (1) To have the workers do the work the way they think is best.
    (2) To have the worker depend upon the leader to make decisions.

12. (1) To get the work done on time.
    (2) To be friendly toward the workers.

13. (1) To act as one thinks best regardless of the views of the workers.
    (2) To be proud of the work group.

14. (1) To give the workers the power to act independently.
    (2) To assign workers to particular tasks.

Go on to the next page

15. (1) To do the important jobs oneself.
    (2) To let the workers decide how to do each task.

16. (1) To leave it up to each worker to get an honest share of the work done.
    (2) To set up most projects for the worker.

17. (1) To call the group together to discuss the work.
    (2) To work right alongside the workers.

18. (1) To pitch right in with the workers.
    (2) To plan the work carefully.

19. (1) To explain carefully each worker's duties
    (2) To spend some time helping to get the work done.

20. (1) To work hard.
    (2) To schedule the work carefully.

21. (1) To be an authority in the type of work the group does.
    (2) To tell poor workers when their work isn't measuring up to what it should be.

22. (1) To do the same work as the group whenever time allows.
    (2) To plan how the group will do the job.

23. (1) To call the group together to discuss the work.
    (2) To attempt to make the leader's work not too different from the work of the group.

24. (1) To be respected as one of high technical skill in the field.
    (2) To spend over half the time in supervisory activities such as planning and scheduling.

25. (1) To let workers know how they are doing on their jobs.
    (2) To spend some time helping to get the work done.

26. (1) To pass along to workers information from higher management.
    (2) To help get the work done.

27. (1) To be known as one of great technical skill in the field.
    (2) To schedule the work to be done.

28. (1) To meet with the workers to consider proposed changes.
    (2) To pitch right in with the workers to help make changes.

29. (1) To explain the duties of each worker's job until they are really understood.
    (2) To pitch right in with the workers.

30. (1) To perform the same work as the workers whenever possible.
    (2) To plan the day's activities in considerable detail.

31. (1) To be known as a skillful trainer.
    (2) To set an example by working hard.

32. (1) To work right alongside the workers.
    (2) To try out new ideas on the work group.

Go on to the next page

## Drinking Inventory

Questions 33 through 48 refer to the drinking of alcohol. Please mark the appropriate space on answer sheet B that describes your drinking behavior. Since this survey is confidential please answer every question honestly and accurately. For example, if item 3 of question 33 describes your wine drinking, fill in space 3 for question 33 on the B answer sheet.

In answering these questions think about your drinking last week, the week before, and so on, for the past three months.

The following four questions are about wine:

In regard to drinking wine:

33. Which one of the following describes how often you usually have wine?

    1. Three or more times a day
    2. Two times a day
    3. About once a day
    4. Three or four times a week
    5. Once or twice a week
    6. Two or three times a month
    7. About once a month
    8. Less than once a month, but at least once a year
    9. Less than once a year
    10. Never

34. Think of all the times you have had wine the past three months. When you drink wine, how often do you have five glasses or more?

    1. Nearly every time
    2. More than half the time
    3. Less than half the time
    4. Once in a while
    5. Never

35. When you drink wine how often do you have about three or four glasses?

    1. Nearly every time
    2. More than half the time
    3. Less than half the time
    4. Once in a while
    5. Never

36. When you drink wine how often do you have one or two glasses?

    1. Nearly every time
    2. More than half the time
    3. Less than half the time
    4. Once in a while
    5. Never

Go on to the next page

The following five questions are about beer:

In regard to drinking beer:

37. Do you usually drink beer?

1. by the glass
2. by the bottle
3. does not apply

38. How often do you usually have beer?

1. Three or more times a day
2. Two times a day
3. About once a day
4. Three or four times a week
5. Once or twice a week
6. Two or three times a month
7. About once a month
8. Less than once a month, but at least once a year
9. Less than once a year
10. Never

39. Think of all the times you have had beer the past three months. On a single occasion, how often do you have five or more beers?

1. Nearly every time
2. More than half the time
3. Less than half the time
4. Once in a while
5. Never

40. On a single occasion how often do you have about three or four beers?

1. Nearly every time
2. More than half the time
3. Less than half the time
4. Once in a while
5. Never

41. On a single occasion how often do you have one or two beers?

1. Nearly every time
2. More than half the time
3. Less than half the time
4. Once in a while
5. Never

Go on to the next page

The following four questions are about liquor—whiskey, vodka, gin, tequila, mixed drinks, and things like that.

42. How often do you usually have liquor?

1. Three or more times a day
2. Two times a day
3. About once a day
4. Three or four times a week
5. Once or twice a week
6. Two or three times a month
7. About once a month
8. Less than once a month, but at least once a year
9. Less than once a year
10. Never

43. Think of all the times you have had liquor the past three months. When you have liquor, how often do you have five or more drinks?

1. Nearly every time
2. More than half the time
3. Less than half the time
4. Once in a while
5. Never

44. When you have liquor how often do you have three or four drinks?

1. Nearly every time
2. More than half the time
3. Less than half the time
4. Once in a while
5. Never

45. When you have liquor; how often do you have one or two drinks?

1. Nearly every time
2. More than half the time
3. Less than half the time
4. Once in a while
5. Never

46. Where do you do <u>most</u> of your drinking? (Pick one)

1. home
2. friends' homes
3. bars
4. restaurants
5. other
6. does not apply

Go on to the next page

47. Who do you do most of your drinking with? (Pick one)

1. family
2. friends
3. anybody around
4. alone
5. other
6. does not apply

48. If you haven't had a drink this past year, but used to drink, would you say you drank?

1. heavily
2. moderately
3. lightly
4. does not apply

Go on to the next page

## General Information

49. Were you born in the U.S.?

    1. yes
    2. no

50. Please indicate your ethnic group:

    1. White
    2. Black
    3. American Indian
    4. Mexican American
    5. Asian American
    6. Foreign
    7. Other

51. Please indicate your age:

    1. 17 or less
    2. 18
    3. 19
    4. 20
    5. 21
    6. 22
    7. 23
    8. 24
    9. 25 or more

52. Please indicate your sex:

    1. Male
    2. Female

53. What year are you in college?

    1. Freshman
    2. Sophomore
    3. Junior
    4. Senior
    5. Graduate Student

**Thank you for you cooperation!**

APPENDIX B

Sample Sizes by Residence Hall
Ethnicity and Sex[a]

| Ethnicity | Residence Hall | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | | B | | C | | D | |
| | M | F | M | F | M | F | M | F |
| White | 39 | 28 | 39 | 71 | 58 | 82 | 56 | 54 |
| Black | - | 3 | - | 4 | 1 | 5 | 4 | 3 |
| American Indian | - | - | - | - | - | - | 1 | - |
| Mexican Indian | - | - | 2 | 1 | - | 1 | 1 | 2 |
| Asian American | - | - | - | 1 | - | - | 1 | - |
| Foreign | - | - | 1 | 1 | 1 | 1 | 2 | - |
| Other | - | 1 | 2 | 2 | 1 | 2 | 3 | - |

[a]21 cases reported no residence hall or ethnicity.

# APPENDIX C

## Procedure used for Generating the Drinking (Absolute-Alcohol) Score[a]

Definitions and Assumptions (Note 2)

1. Amount of absolute alcohol consumed per day in the unit of measurement.

2. The figures used for computing percent amount of absolute alcohol in a beverage are: beer = 4%, wine = 15%, liquor = 43%.

3. A glass of beer = 8 ounces, a bottle of beer = 12 ounces, a glass of wine = 4 ounces, a liquor based drink = 1.5 ounces.

4. A response of one or two drinks is scored as 1.5 drinks.

   A response of three or four drinks is scored as 3.5 drinks.

   A response of five or more drinks is scored as six drinks

The following tabulation is used for converting frequency items to a units of times per day score.

| Item Choices | Units Score |
|---|---|
| 3 or more times a day | 3.00 |
| 2 times a day | 2.00 |
| About once a day | 1.00 |
| 3 or 4 times a week | .50 |
| Once or twice a week | .20 |
| 2 or 3 times a month | .10 |
| About once a month | .05 |
| Less than once a month but at least once a year | .01 |
| Less than once a year | .00 |
| Never | .00 |

The responses to the quantity item are assigned the following weight values:

0 - Never
1 - Once in a while
1 - Less than half the time
2 - More than half the time
2 - Nearly every time

For each respondent the weight assigned based on the five choices listed above is multiplied by the amount of absolute alcohol associated with that item choice. This amount of absolute alcohol is determined as shown in the following tabulation.

| Questionnaire Item No. | No. of Drinks | No. of Ounces | Amount of Absolute Alcohol |
|---|---|---|---|
| **Wine** | | | |
| 34 | 6 | 24 | 3.60 |
| 35 | 3.5 | 14 | 2.10 |
| 36 | 1.5 | 6 | .90 |
| **Beer (glass)** | | | |
| 39 | 6 | 48 | 1.92 |
| 40 | 3.5 | 28 | 1.12 |
| 41 | 1.5 | 12 | .48 |
| **Beer (bottle)** | | | |
| 39 | 6 | 72 | 2.88 |
| 40 | 3.5 | 42 | 1.68 |
| 41 | 1.5 | 18 | .72 |
| **Liquor** | | | |
| 43 | 6 | 9.00 | 3.87 |
| 44 | 3.5 | 5.25 | 2.26 |
| 45 | 1.5 | 2.25 | .97 |

The products obtained for the items for each beverage are summed and then divided by the summed weight values associated with the quantity item choices. This gives an average quantity of absolute alcohol intake for each beverage, per occasion. The three beverage scores are added to yield the (absolute alcohol) drinking score.

For example, a subject reports drinking beer by the bottle about three or four times a week. Giving a frequency score of .50. The subject also reports drinking five or more beers more than half the time (weight = 2), three or four beers less than half the time (weight = 1), and one or two beers once in a while (weight = 1).

The beer (absolute alcohol) score = .5 (2 x 2.88 + 1 x 1.68 + 1 x .72)/(2 + 1 + 1) = 1.02

This procedure is applied to the other two beverage responses, and the three summed to give a total (absolute alcohol) drinking score.

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[a]Based on Jessor, et al., 1968, pp. 483-486.

APPENDIX D

Alpha Internal Consistency
Reliabilities

| Scale | N of Items | Alpha | N of Cases[a] |
|---|---|---|---|
| Differentiated Role | 16 | .69 | 469 |
| People Orientation | 16 | .69 | 464 |
| Preference Inventory | 24 | .40 | 422 |

[a]N based on complete data for a scale.

# REFERENCE NOTES

## REFERENCE NOTES

1. This instrument was called the Empathy Test by Smith (1973). The more neutral term Preference Inventory was used in the present investigation.

2. To compute the absolute alcohol equivalents for the present study conducted in the State of Michigan, the following average percentages of absolute alcohol by volume were used: beer, 4%; wine, 15%; distilled spirits, 43%. The estimate of eight ounces was used to define "a glass of beer". (Zucker, R. A., Personal communication, March 15, 1978).

3. Yano, Rhoads, and Kagan (1977) used milliliters (ml) of absolute alcohol to establish their categories: light drinkers consume some but less than 11 ml per day; moderate drinkers consume 11 to 60 ml per day; heavy drinkers consume more than 60 ml per day. Yano, et al. used an approximation of one ounce as being equivalent to 30 ml, converting the amount originally reported in ounces into milliliters. Consistent with Jessor, et al. (1968) and Little, et al. (1977), the present study used ounces for the categories of drinking.

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