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Relationship of Extroversion and Religion to Hierarchical Drug Use in Adolescents

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RELATIONSHIP OF EXTROVERSION AND RELIGION TO HIERARCHICAL DRUG USE IN ADOLESCENTS

by

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VITA

Lisa Anne Aiken, the daughter of Sidney H. and Janet S. Aiken, was born in Baltimore, Maryland on July 8, 1956.

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INTRODUCTION AND REVIEW OF THE RELATED LITERATURE

In recent years, the problems of alcohol and drug abuse have generated a considerable amount of research. Nevertheless, the abundance of such literature has not resulted in a consensus regarding the types of people who are apt to use or abuse drugs, nor as to the ways in which drugs are used by different populations. The research in drug and alcohol use is hindered in finding a consensus of results by the facts that the populations sampled by various experimenters are not identical, and the discovery, availability, and acceptability of use of numerous drugs has changed frequently. Laws regulating drug trafficking and personal use of drugs, particularly of cannibis, have changed during this decade. In addition, new drugs and combinations of drugs are constantly being discovered and tried.

In the past few years, not only the drugs available for abuse have changed, but the profile of the drug user himself has changed. Current literature shows that drug use among adolescents is on the rise, and is beginning at increasingly early ages (Gorsuch and Butler, 1976). Despite the morass of contradictory findings regarding drug use by teens, it has been hypothesized that there is a stable and nonrandom pattern of drug use among adolescents, irrespective of race, sex and family educational background (Kandel and Faust, 1976; Hamburg, Kraemer and Jahnke, 1976). Kandel and Faust interviewed 200 high school students in New York State, and Hamburg et al. reviewed completed questionnaires from

over 7,000 junior and senior high school students from California. Although populations differed between the two studies, both found that adolescents used groups of drugs progressively, in the following order: First, beer or wine; second, hard liquor; third, marijuana or hashish; fourth, hallucinogens, stimulants and sedatives; and fifth, narcotics. That is, initial drug use tended to begin with use of beer or wine. If other drugs were used, hard liquor would tend to be used next, and then marijuana. Use of hallucinogens would seldom occur if drugs at the prior three levels had not previously been used, and use of narcotics tended to occur only after drugs at the previous four levels had already been tried.

Hamburg et al. found that 78% of the students in their sample followed the above progression in using drugs. They also found that as young people progress through school grades, drug use increases such that increasing grade in school directly parallels the use of higher-level drugs.

Other studies have shown that becoming intoxicated or drinking frequently is associated with, or precedes, high use of illicit drugs (Wechsler, 1976; Wells and Stacey, 1976). Among those who drank liquor frequently, Wechsler (1976) found that 40% also used barbiturates and 32% used amphetamines, as compared with 6% and 2%, respectively, among those who drank only beer or wine and no hard liquor. In addition, illicit drug use among abstainers from alcohol use was almost nonexistent. This was also found by Kandel and Faust (1976) and by Hamburg et al. (1976). Frequency of drinking was associated with a tendency to have used marijuana, amphetamines, barbiturates and LSD, whereas frequency of

drinking to the point of intoxication was associated with a tendency to have used hashish, mescaline, strong pain killers, methaqualone and cocaine, in addition to tranquilizers. Thus, not only the use of alcohol, but also the intensity with which one used it, were related to progression up the drug hierarchy.

Kandel and Faust (1976) proposed that progression to use of higher-ranked drugs is directly related to intensity of drug use at the prior, lower-ranked stage, and that the two stages of legal drugs (1. beer, wine; 2. liquor) were necessary intermediaries between abstention from drug use and use of marijuana. It was noted that use of marijuana preceded illicit drug use in each year of high school, and that use of each cluster of drugs, (e. g., alcohol or narcotics) tended to be initiated at specific ages. In both studies (Kandel and Faust, 1976; Hamburg et al., 1976), the median ages of the first use of drugs were as follows: Liquor, ages 12 or 13; marijuana, ages 13 or 14; hallucinogens and pills (sedatives and stimulants), ages 17 or older. This age-specificity suggested that adolescents make new decisions at each step of the hierarchy as to whether or not they will progress to the next level of drug use. Thus, an age-related hierarchy of drug use was proposed in which adolescents with the same drug experiences may or may not move up the hierarchy. The personal attributes of the adolescent, the social context in which the drugs are used, and the developmental stage of the user all contribute to his particular pattern of use, but particular characteristics which influence a choice to move up the hierarchy remain somewhat obscure. Nevertheless, numerous studies have attempted to identify the personality characteristics of the adolescent drug user. Heavy drug

users were found to value immediate pleasure and spontaneous social activity over postponed gratifications (Holroyd and Kahn, 1974), and to be impulsive and nonconforming, with an inclination towards thrill-seeking (Holroyd and Kahn, 1974; West, 1975). The principal personality characteristic of heavy drug users was concluded by Holroyd and Kahn to be a lack of respect for traditional values. These findings are consistent with those of Hogan, Mankin, Conway and Fox (1970) who administered the California Personality Inventory to frequent users of drugs. The drug users indicated an overconcern with personal pleasure, impulsivity, a nonconforming achievement motivation, and a hostility towards rules and conventions. Principaled nonusers of drugs were characterized by being deferential to external authority, and being overcontrolled. Huba, Segal and Singer (1977) also found the achievement motivations of drug users not to be expressed in socially desirable ways, whereas for nonusers they were. Furthermore, drug users tended to have a more generalized susceptibility to social pressure, and a greater need for stimulation than did nonusers. These studies, then, point to drug use as a possible means for seeking stimulation. While nonusers of drugs may resort to conventional means for enjoyment, drug users may achieve the same ends through use of drugs. A seven-year longitudinal study of high school students in California indicated that the main reason students gave for using LSD and marijuana was to have fun (West, 1975), a result that supports the above hypothesis. Clarey (1975) found that drug users participate in activities of a different nature than those in which nonusers of drugs participate. In Clarey's study of male students from a private high school, reported use of tranquilizers was positively correlated with

community service, leadership, art and music accomplishment, and social service competencies scores, and alcohol use was positively correlated with technical and trade competence scores, and with work experience accomplishment. This was interpreted to mean that the drug user does not withdraw from social activities--rather, he uses drugs in addition to them.

In attempting to group the above personality characteristics, it seems that many of the personality correlates of high drug use are a search for excitement through nonconforming experiences, and a rejection of traditional values. Hamburg et al. (1976) found significant differences between high and low drug users in the amount of time they spent alone, in organized activities, rather than in raps or parties, and amount of time spent in religious activity. The more time spent in these activities, the less was the tendency to use drugs. Just as Clarey (1975) found, drug users did participate in activities, only they were different from the type in which drug abstainers participated.

Much interest has been generated by the relationship of stimulus-seeking to drug use, but relatively little research has been conducted relating religious observance to drug use in adolescents, although Hamburg et al. found this factor to be significantly related to drug use. Most of the research in this area has investigated the relationship of religion to drinking behavior (e. g., Skolnick, 1958; Gusfield, 1970), as opposed to the degree of religious commitment, or their effects on general drug use.

Various religious groups tend to use alcohol in different ways. For instance, Protestant college students have been found more frequently

to be high users of alcohol and problem drinkers (meaning their drinking resulted in social complications such as missed appointments, alienation of friends or interference with social relationships) than were Jewish students, although more Jewish students than Protestant or Mormon students drank (Gusfield, 1970). Jewish college students also had much lower rates of intoxication than did students labelling themselves as members of Protestant denominations that eschew use of alcohol or as students of the Mormon faith.

In a study done by Skolnick (1958), a random sample of white males were drawn from the College Drinking Survey conducted by the Yale Center of Alcohol Studies. It was found that 92% of the Jews had used alcohol prior to age 11, as compared with 58% of the Episcopalians and 28% of the Methodists. Not only were there differences in the ages of initial alcohol use, but there were also differences in the places at which alcoholic beverages were consumed. Three-quarters of the Methodists usually drank beer in commercial places, with small groups of male friends; less than half of the Episcopalian and Jewish groups did so. The groups also differed in the type of beverage drunk--wine was the predominant alcoholic beverage drunk by Jews, whereas beer was the most frequently used type of alcohol among all other religious groups. Skolnick indicated that "the abstinence orientation (in certain religious groups, such as the Methodists) seemed to encourage problem drinking in those who rejected the norm of total abstinence". However, within each religious category, subjects with frequent religious participation tended to have a lower magnitude of social difficulties associated with their drinking than did nonreligious subjects. Skolnick concluded by saying

that religious affiliation influences drinking behavior more than any comparable variable. One criticism of Skolnick's study is that he did not differentiate between wine used by subjects for religious rituals and that used for social or dinner drinking, or for purposes of intoxication.

Snyder (1959) proposed that alcoholism is a function of a combination of three major factors: A dynamic or psychic one; a normative one; and one based on alternative or culturally-patterned stress-reducing behaviors that serve as functional equivalents to drinking. If alcoholism is a reflection of these three factors, it seems reasonable to assume that use of alcohol and other drugs should also be, in part, a reflection of these three factors. Skolnick, however, seems to have neglected to differentiate between uses of wine and other types of alcohol as being stress-reducing agents as opposed to their being used for religious ritual or for beverage purposes. Hamburg et al. (1976) stressed the importance of studying the use of alcohol in a differentiated way, since use of wine and beer do not have the same patterning or meaning as does use of hard liquor.

To summarize the data presented earlier in this paper relating religious activity to drug use, it was found that low use of alcohol is correlated with low use of other drugs, and among those who use drugs infrequently are persons who are religiously active. Those who have little need for unconventional types of excitement also had lower drug use than did others. Due to the demands put on the religiously active individual to conform to religious norms, it seems likely that religious activity and low needs for unconventional stimulation are positively

correlated.

In the case of Jews, it is generally assumed that there are social and religious norms which surround the use of alcohol in the Jewish culture, and discourage its use for other than religious functions. In addition, perhaps there are more general norms which discourage the use of any drugs which impair self-control. Alternatively, perhaps the low use of liquor among Jews, particularly among the Orthodox, is in part a reflection of personality dimensions which are shared by Jews as a group, specifically relating to introversion and the avoidance of certain forms of external stimulation. It has already been seen that those with little need for unconventional forms of stimulation tend not to be drug users. Perhaps Jews are more introverted than are other groups, and this accounts for part of the reason that they avoid drinking alcohol, particularly when it is drunk in commercial establishments where stimulation would be high.

Eysenck (1967) has formulated a personality theory which relates external stimulation to physiological needs of the individual, and attempts to explain why certain people would need more external stimulation than would others. His personality theory suggests that people tend to fall along a continuum of introversion-extroversion, with extroverts showing slower, weaker neural excitation and faster, stronger neural inhibition than introverts. Introverts and extroverts are hypothesized to have different physiological needs for stimulation, and differential susceptibilities to the effects of drugs. Extroverts are predicted not only to require more external stimulation than introverts, but also to seek out unconventional and nonconforming types of

stimulation. According to this theory, extroverts should be more common than introverts among groups of persons who use drugs. One reason for this is that, according to Eysenck (1967), the majority of people have been conditioned to have unpleasant autonomic reactions at the thought of committing offenses against mores or laws. Since introverts condition more readily than do extroverts, they are more likely than extroverts to have become conditioned to these unpleasant reactions, and are less likely to violate norms. Furthermore, according to this hypothesis, the extrovert is expected to be sociable and lively, while the introvert is likely not to be especially sociable, and this sociability of the extrovert is likely to expose him to drug users, or to situations in which drugs are used. Thus, not only will the introvert condition more readily to social norms, but he will not tend to seek out external forms of stimulation, since his cortex is already in a state of high stimulation.

A question raised by Eysenck's hypotheses is whether or not religiously committed persons, or persons of certain religions, are more introverted than others. Perhaps introversion, in combination with religious norms are both necessary for the religious Jew to avoid frequent drinking of hard liquor or beer and to indulge in drinking wine in conjunction with religious rites in a society where social drinking is prevalent.

If, in fact, the introvert conditions more readily than does the extrovert to social norms governing use of alcohol, then it would be expected that Jews who do not drink liquor should be more introverted than those who do drink. The extroverted Jews should predominate

within the group of Jews who use liquor, beer or wine in non-ritual contexts, while introverts would be expected to use wine more frequently in ritual contexts than would extroverts.

Jews and Christians who make religious values and commitment central in their lives to the same degree should be alike on introversion-extroversion measures, if it is the Jewish norms which govern alcohol use, rather than personality dimensions which are the primary factor responsible for patterns of alcohol use by Jews. If religiously observant Jews use less liquor and beer than do less observant Jews, irrespective of the introversion-extroversion dimension, and religiously committed Christians use more alcohol than do their Jewish counterparts, the religious norms surrounding alcohol use by Jews would be especially potent.

One may also apply Eysenck's theory of introversion-extroversion to use of drugs other than alcohol. Eysenck's hypotheses regarding the drug-seeking behavior of extroverts have been supported by studies which have found that adolescents and college students who use cigarettes, alcohol and other drugs are more extroverted, thrill-seeking and arousal-seeking than are nonusers (Schubert, 1965; Kanekar and Dolke, 1970; Jenkins, 1975; Kamali and Steer, 1976; Huba, Segal and Singer, 1977). In a study in which marijuana users were compared to nonusers, the college students who were users were found to be pleasure-seeking, rebellious, hostile to roles and conventions, and were nonconformists (Hogan et al., 1970). Among drug users, Eysenck (1957) has further specified that introverts should prefer barbiturates more than should extroverts, since the introvert's cortex is already in a state

of strong stimulation. Some support for this has been found by Zuckerman, Bone, Neary, Mangelsdorff and Brustman (1972). In their study, high stimulus-seeking males tended to use stimulants, whereas low stimulus-seeking males who used drugs often used barbiturates. If one hypothesizes that religiously committed persons are more introverted than others, one might expect them to use barbiturates, sedatives and/or tranquilizers more than any other drugs. These patterns of drug use might also be expected to occur because religiously committed people are probably more stressed than others because they are more conscientious and than others and possibly perfectionistic.

Although Eysenck's concept of introversion has been related to high drug and alcohol use, there may be other variables which more adequately account for high drug use by certain individuals. A separate personality dimension which is related to introversion-extroversion is thrill-seeking. According to Zuckerman, Kolin, Price and Zoob (1964), the sensation-seeker needs varied, novel and complex stimuli to maintain an optimal level of arousal, which is higher than that of non-sensation-seekers. When stimuli and experiences become repetitive, the sensation-seeker will become bored more quickly than will others, and this state can be a form of mental distress. The sensation-seeker is also more sensitive to inner sensations and less conforming to external, social constraints than those who are not sensation-seekers. In a series of experiments, it was found that a general sensation-seeking trait was related to an uninhibited, nonconforming, impulsive type of extroversion, but correlations between sensation-seeking scales and personality inventories have never been high enough to suggest that seeking

sensational experiences is nothing more than extroversion (Zuckerman et al., 1972). It seems, then, that sensation-seeking is only one aspect of Eysenck's (1967) extroverted personality type, but sensation-seeking may better account for patterns of drug use than does an extroverted personality.

Drug use was related to measures of thrill-seeking in the study by Holroyd and Kahn (1974), which found heavy drug users had lower scores on harmavoidance scales, and higher scores on impulsivity, inquisitiveness and playfulness than did nonusers of drugs. In a different study, high drug use in high school students was also found to correlate with gregariousness, early dating, and frequent partying, none of which were associated with abstaining from drug use (Hamburg et al., 1976). These results, in conjunction with those of Flynn (1970), Keniston (1965), Liebert (1967), Blum (1966), and Deardon and Jekel (1971) all point to drug use as a reflection of the need for stimulation or for novelty due to propensities to extroversion or sociability, or due to thrill-seeking. It is not clear which of these possibilities plays the most important role.

Self-reports of students' motivations in using drugs support the above hypotheses regarding the association between extroversion and sensation-seeking and drug use. High school students have reported that they use drugs to relieve boredom or to have fun (Jenkins, 1975; Kamali and Steer, 1976). If students are sensation-seekers, one may hypothesize that once the novelty of using legal drugs dissipates, they are likely to turn to illicit drug use. Khavari, Mabry and Humes (1977) noted that the illicit character of most drugs used by adolescents

heightens the sensation-producing potential of those drugs. They found marijuana use and use of hallucinogens were differentially associated with variables relating to sensation-seeking and extroversion-introversion. Marijuana use was found to be associated with a person's need for social approval and the desire to seek out uninhibited modes of self-expression. Use of hallucinogens was associated with manifest anxiety, need for social stimulation and extroversion.

When Zuckerman et al. (1972) gave the Sensation-Seeking Scale to college students, the greatest number of users of all drugs, except for tranquilizers, were the high sensation-seeking males. For the group of females, high sensation-seekers used significantly more barbiturates than did low sensation-seekers. For all groups combined, significant differences between high, low and moderate users of hashish, amphetamines and LSD resulted when high and low sensation-seekers were compared. Thus, sensation-seeking and the seeking of new experiences (as distinct from extroversion) were found to be significantly related to concurrent drug use (Baskett and Nyswander, 1973; Zuckerman et al., 1972; Khavari, Mabry and Humes, 1977). Although no significant differences were found by Zuckerman et al. between high and low sensation-seeking males for alcohol and marijuana use, the researchers concluded that drug usage was a manifestation of general sensation-seeking, but that alcohol, cigarettes and marijuana had become so prevalent among college students that they had ceased to be "sensational".

Given that tendencies towards sensation-seeking and extroversion appear to predispose the adolescent to drug use, what happens to the religiously committed individual who has these tendencies? Are there

differences between how Jews and Christians would direct their manifestations of thrill-seeking and extroversion through drug use? Would these directions depend upon how religiously committed the individual was? For instance, if a Jewish adolescent wishes to seek sensational experiences, will the social norms prohibiting use of liquor be totally ignored, resulting in higher use of liquor than the average among Christians, for whom use of alcohol is not so strongly opposed? Or, if there are more general norms among Jews which prohibit loss of self-control would Jewish adolescents eschew use of any drug which results in loss of control, such as hallucinogens, while selecting marijuana and pills as drugs of choice? It is also conceivable that stimulus-seeking Jewish adolescents who use drugs would rebel against all drug sanctions and use drugs in the same manner as Christians, or more intensively than Christians.

It is expected that religiously committed subjects, as a group, will tend to use fewer drugs and use drugs less frequently than less religiously committed adolescents. This would be anticipated because the religious doctrines encourage internalized self-control and have sanctions against the use of drugs. Also, organized religion may offer adolescents alternative means of seeking stimulation through life structure, conventional activities and peer group activities other than using drugs, which youth who are not religiously active may lack. It is also plausible that subjects who are religiously committed may have less need to seek external stimulation than do subjects who are less religiously committed, and this will be investigated in the present study.

Two problems with earlier research relating religion to drug use are that such studies have been concerned only with use of alcohol, and have seldom differentiated between different degrees of religious commitment or observance (e. g., Skolnick, 1958). Rather, most studies have grouped together all subjects proclaiming affiliation with the Jewish, Methodist, Episcopalian or other faiths. The present study will attempt to remedy this situation.

No study has yet investigated the relationship between hierarchical drug use, religion and extroversion-introversion dimensions in adolescents. It seems likely that the differential selection and use of drugs at various ages is related to adolescents' needs for stimulation, and acceptance or rejection of traditional values. The present study is designed to elucidate how these dimensions are related to hierarchical drug use in adolescents.

It is hypothesized that there will be significant differences between extroversion scores for users of different classes of drugs. When subjects are classified according to the highest drug used, beer users will have lower scores on the extroversion scale than will liquor users, who will have lower scores than marijuana users, who will have lower scores than users of hallucinogens or stimulants. Barbiturate users are also expected to have lower extroversion scores than amphetamine users. This is expected to apply more strongly to ninth-graders than to twelfth-graders.

Subjects with high religious commitment are expected to use lower classes of drugs and to use them less frequently and less intensively than those who are less religiously committed. (Intensity will be

determined by using drugs to get drunk or very high).

The relationship between reasons for drug use and the extroversion-introversion dimension will be explored. The extroversion scores for subjects indicating different principal reasons for using each drug are expected to be significantly different. The extroversion scores for subjects who are frequent solitary drug users should be lower than for those who frequently use drugs in small groups or with one or two friends, which should be lower than for those who principally use drugs at parties. The more frequently each drug is used, the higher the extroversion scores for that drug class are expected to be, and the frequent users of overlapping drugs should have higher extroversion scores than abstainers from mixed use of drugs.

Finally, Jews are expected to use less alcohol in overlap with other drugs than do Christians, and highly religious subjects are expected to have lower extroversion scores than subjects who are less religiously committed.

The purposes of the present study are twofold: First, to assess the magnitude and patterns of drug and alcohol use in a particular population--namely, one which consists of a high proportion of Jews, as well as a mixture of Christians of diverse ethnic and religious backgrounds. These results will be examined in light of Kandel and Faust's (1976) and Hamburg et al.'s (1976) populations of drug users, and their theory regarding hierarchical drug use. Secondly, the use of drugs in the present population will be related to the variables of religion, religious commitment and extroversion-introversion.

METHOD

Subjects

A random sample of 70 boys and girls were selected from one middle-class, urban public high school, sampling Jews and Christians. The school is primarily white; however, students of 45 different ethnic backgrounds are represented at the school. Thirty-five students each from ninth and twelfth grades were used. Forty-five students from ninth and twelfth grades at a Jewish day school and 36 ninth- and twelfth-graders from a Roman Catholic school in the same area were also tested.

Two ninth-graders from the public school, and two ninth-graders and one twelfth-grader from the Catholic school did not complete their questionnaires. In addition, two questionnaires from the public school had to be discarded due to random responding.

Measures

The Eysenck Personality Inventory (EPI) has been shown to have high test-retest reliability, ranging between .80-.97 (Eysenck and Eysenck, 1968). High extroversion scores are indicative of extroversion on the EPI. The typical extrovert is sociable, likes parties, has many friends, needs to have people to talk to, and does not like reading or studying by himself. He craves excitement, takes chances, often sticks his neck out, and acts on the spur of the moment. He is fond of practical jokes and generally likes change. He is also carefree,

easygoing, optimistic, and likes to "laugh and be merry". He prefers to keep moving and doing things, tends to be aggressive, and may lose his temper quickly. His feelings are not under tight control, and he is not always a reliable person (Eysenck and Eysenck, 1968).

Low scores on the EPI extroversion scale are indicative of introversion. The typical introvert is a quiet, retiring sort of person, introspective, and fond of books rather than people. He is reserved and distant except to close friends. He tends to plan ahead and does not trust the impulse of the moment. He does not like excitement, takes life matters appropriately seriously, and likes a well-ordered mode of existence. He keeps his feelings under tight control, is seldom aggressive, and does not easily lose his temper. He is reliable, somewhat pessimistic and very ethically-minded (Eysenck and Eysenck, 1968).

Lanyon (1972) noted that these two scales adequately reflect Eysenck's concepts of extroversion and introversion, and noted many correlates of extroversion and introversion as judged by this inventory in educational, industrial and clinical fields. He concluded that Eysenck's Personality Inventory developed as the basic tool for research on Eysenck's personality theory, "and that its validity for this use is unquestioned".

The drug use inventory which was used in the present study is found in Appendix A. It has been found that such self-reports of drug use are valid measures of actual drug use in high school students, and are consistent with reports of drug use by friends, peers and observers (Hamburg et al., 1976). The third and fourth questions on the questionnaire were included merely to bridge the gap between responding to the

EPI and the "real" questions on drug use by the respondent. These two questions were disregarded in the data analyses.

Huba, Segal and Singer (1977) supported the conceptual basis for showing not only qualitative, but also quantitative differences between users and nonusers of drugs, and therefore, the questionnaire sampled questions regarding both the frequencies and types of drug and alcohol use, as well as how and why these drugs were used.

Procedure

The principals at the schools involved in this study were contacted, and were explained the purposes and procedures of the present study. After receiving consent allowing students to participate, students in the selected classes were asked to participate in a study which was attempting to find out some information about how different people use drugs and alcohol. All subjects were administered the EPI and the drug use questionnaire during group testing in their respective schools. The students were told:

> The first questionnaire is to find out whether the person answering it tends to be alone more or to be with people more. It is not a test of normality or abnormality, but it is simply a way of finding out how people are different. The second questionnaire is a drug use questionnaire, and it is to find out how different individuals use drugs or don't use drugs.

The importance of responding as honestly as possible was also stressed. Subjects were then given the option of completing or not completing the questionnaires, and were told that at any time they could withdraw from the study.

Tests were administered during one class period, and were generally completed within 30-40 minutes. No identifying data was requested to

be given on the answer sheets, other than sex, grade and religion, in order to ensure confidentiality and anonymity of responses. Tests and answer sheets were distributed randomly to desks prior to the subjects' entering the room, and subjects were allowed to sit wherever they chose. Neither the researcher, school principals, teachers nor other students could determine the responses of individuals unless the subject himself revealed the information. Only the researcher, one teacher who was available for proctoring if the subjects themselves asked the teacher for assistance, and the subjects themselves were allowed in the classroom during testing. When subjects completed their questionnaires, they placed them in a large envelope so that anonymity would be further ensured.

After the data analyses were completed, feedback to the school principals was given in the form of summary data for either their school or for all groups combined. In addition, those subjects wishing to know the results of the EPI extroversion scale were given this information, along with an explanation of the meaning of their scores.

RESULTS

Chi-square analyses and analyses of variance were done, using questions from the questionnaire and comparing subjects of different grades, religions, degrees of religious commitment and extroversion scores. Subjects were categorized for religious commitment on the basis of Jews describing themselves as Orthodox, Conservative, Reform, or non-practicing. Christians described themselves as belonging to one of four corresponding categories, on the basis of their responses to the question, "How important is religion in your life?". Those who indicated that it was a central issue and that they were involved at least weekly in religious activities were equated with Orthodox Jews, and were considered highly committed to religion. Those who indicated that religion was important and that they were involved at least monthly in religious activities were equated with Conservative Jews, and were considered moderately committed to religion. Those who indicated that religion was somewhat important, but were infrequently involved in religious activities were equated with Reform Jews, and were considered minimally committed to religion. Those who indicated that religion was not important were equated with non-practicing Jews. Non-practicing subjects of both religions were considered minimally committed to religion, and their results were combined with those of the Reform Jews and the minimally committed Christians.

In order to determine extroversion or introversion, it was

decided to classify the upper 25% of scorers on the EPI as extroverts, and the lower 25% as introverts. This was done due to the fact that no appropriate norms for the adolescent population tested were available. Furthermore, it was considered more appropriate to see how subjects differed within the sample as opposed to seeing how the present sample differed from other populations. As compared with adults, the scores used as criteria for introversion (scores of 7-11) would have been considered in the low average range, not as introversion scores. The extroversion scores (scores of 15-19), however, would have been comparable to the upper 10% of adult scores, which would certainly indicate extroversion in adults. This classificatory scheme was used only for the analyses using extroversion-introversion as an independent variable. For analyses using extroversion scores as dependent variables, no data transformations were made.

Chi-square analyses were done comparing subjects on use of marijuana or hashish (question 5), hallucinogens (question 20), beer or wine (question 28), amphetamines (question 41), and depressants (question 48), as well as use of alcohol prior to using marijuana (question 15). Chi-squares for the reasons extroverts and introverts principally used the various drugs were planned, but the sample sizes were too small for these comparisons to be made, except for the marijuana users.

Four-way analyses of variance were calculated for frequency of use of each class of drug (questions 6, 7, 21, 22, 29, 30, 35, 36, 42, 43, 49, 50), for ritual use of wine (question 31), for situations in which alcohol was used (questions 32 and 38), for amount of alcohol consumed (questions 23, 34, 37), intensity of use (questions 39 and 40),

for enjoyment of marijuana (question 17), and for use of overlapping drugs (questions 18 and 19). Two-way analyses of variance were calculated for situations in which drugs other than alcohol were used (questions 8, 9, 10, 23). The independent variables for these analyses were extroversion-introversion and sex. Scheffé post hoc comparisons were done to analyze interactions, and simple main effects were analyzed by F tests when the overall analyses of variance were significant.

A two-way analysis of variance was also done comparing subjects of different religions and degrees of religious commitment on extroversion scores, but this was not significant. Finally, drugs were intercorrelated to determine how frequency and intensity of drug use are related to use of other drugs.

A breakdown of the subjects in the sample is presented in Table 1, and frequency counts for the numbers of subjects who had used each drug are presented in Table 2. The frequencies of use of each drug appear in Table 3, and the significant χ^2 analyses appear in Table 4. The results of the other analyses follow, and are presented according to drug class.

Beer and Wine

Most subjects had used beer or wine, but there were significantly fewer ninth-graders than twelfth-graders ($\chi^2_1 = 4.30$, $p < .038$), and fewer Christians than Jews ($\chi^2_1 = 7.55$, $p < .006$) who had tried beer or wine. Religious commitment and extroversion were not related to whether or not one had ever tried beer or wine. On the other hand,

Table 1

Composition of Population

	N	%
Grade		
Ninth	71	50
Twelfth	72	50
Sex		
Male	58	41
Female	85	59
Religion		
Jewish	55	39
Christian	86	61
Degree of Religious Commitment		
Jewish: Orthodox	32	56
Conservative	17	30
Reform or non-practicing	8	14
Christian: Highly committed	11	13
Moderately committed	27	31
Minimally committed	48	56

Table 2

Frequencies of Users and Nonusers of Alcohol,

Marijuana, Hallucinogens and Pills

	N	% of total
Have used beer or wine	112	78
Used beer, wine or alcohol prior to using marijuana	35	70*
Have used marijuana	51	36
Have used hallucinogens	14	10
Have used stimulants	17	12
Have used sedatives, tranquilizers or depressants	22	16

*Percent of marijuana users

Table 3

Frequency of Drug Use During Past Month and Past Year (in %)

	None	Once a month or less	2-3 times a month	Once a week	More than once a week
Drug					
Beer or wine (N=110)					
past month	26	12	12	33	17
past year	8	32	13	29	18
Liquor (N=109)					
past month	44	21	14	14	8
past year	31	30	20	20	7
Marijuana (N=50)					
past month	42	18	4	2	34
past year	18	37	10	4	31
Hallucinogens (N=13)					
past month	38	31	23	-	8
past year	27	47	13	7	7
Amphetamines (N=17)					
past month	33	22	22	17	6
past year	6	50	22	22	-
Depressants (N=19)					
past month	68	9	18	5	-
past year	18	59	18	5	-

TABLE 4

Significant $\underline{X}^2$ Analyses for Use or Nonuse of Drug by Grade, Religion, and Degree of Religious Commitment (Degree)

		Users	Nonusers
Wine or beer x Grade	Ninth	50	21
$\underline{X}^2_1 = 4.30$, $\underline{p} < .038$	Twelfth	62	10
Wine or beer x Grade	Jewish	50	5
$\underline{X}^2_1 = 7.55$, $\underline{p} < .006$	Christian	60	26
Marijuana x Grade	Ninth	14	57
$\underline{X}^2_1 = 14.28$, $\underline{p} < .0002$	Twelfth	37	35
Marijuana x Religion	Jewish	13	42
$\underline{X}^2_1 = 4.69$, $\underline{p} < .03$	Christian	37	49
Marijuana x Degree	High	8	35
$\underline{X}^2_1 = 7.74$, $\underline{p} < .02$	Moderate	19	24
	Low	23	32
Stimulants x Degree	High	1	42
$\underline{X}^2_1 = 7.75$, $\underline{p} < .02$	Moderate	4	39
	Low	11	44
Depressants x Degree	High	2	41
$\underline{X}^2_1 = 6.61$, $\underline{p} < .037$	Moderate	7	35
	Low	13	42

subjects who were highly committed religiously used beer or wine during the past month and past year significantly more often than did moderately religious or non-practicing subjects ($F_{2,77} = 6.35$, $p < .003$ and $F_{2,77} = 4.07$, $p < .021$, respectively). Subjects with high religious commitment indicated that they used beer or wine an average of two or three times during the past month, whereas less religiously committed subjects averaged drinking once or twice during the previous month. During the past year, religiously committed subjects estimated using beer or wine nearly once a week, and less committed subjects drank about two or three times a month.

The analyses of variance for use of beer or wine during the past month and past year appear respectively in Tables 5 and 6. Grade, religion and extroversion all interacted in determining the frequency of beer or wine use during the previous month ($F_{2,77} = 3.54$, $p < .034$). Among twelfth-grade extroverts, Christians drank more often than did Jews ($F_{1,77} = 5.50$, $p < .01$), but in twelfth grade, Christians as a group and Jewish introverts drank equally often. Religion and extroversion also interacted for frequency of drinking beer or wine during the past year ($F_{2,78} = 5.54$, $p < .006$), resulting in Christian extroverts drinking significantly more often than Christian introverts ($F_{1,78} = 5.69$, $p < .02$). Grade, degree of religious observance and extroversion all interacted ($F_{4,78} = 2.66$, $p < .039$) as well, such that twelfth-grade introverts of minimal religious commitment drank wine and beer less often than did their extroverted counterparts with minimal ($F_{2,78} = 7.62$, $p < .05$), moderate ($F_{2,78} = 7.89$, $p < .05$), or high ($F_{2,78} = 6.48$, $p < .05$) religious commitment.

TABLE 5

Frequency of Wine and Beer Use during the Past Month by Grade, Religion (Rel), Degree of Religious Commitment (Deg) and Extroversion-Introversion (EI)

Source	SS	df	MS	F
Grade	1.09	1	1.09	.59
Rel	1.09	1	1.09	.60
Deg	23.35	2	11.67	6.36**
EI	.50	2	.25	.14
Grade x Rel	1.90	1	1.90	1.04
Grade x Deg	.97	2	.49	.27
Grade x EI	.39	2	.19	.11
Rel x Deg	8.46	2	4.23	2.30
Rel x EI	12.50	2	6.25	3.40*
Deg x EI	11.67	4	2.92	1.59
Grade x Rel x Deg	5.60	2	2.80	1.52
Grade x Rel x EI	13.02	2	6.51	3.54*
Grade x Deg x EI	14.95	4	3.74	2.03
Rel x Deg x EI	13.35	4	3.34	1.82
Explained	95.09	31	3.07	
Residual	141.46	77	1.84	
Total	236.55	108	2.19	

*$p < .05$

**$p < .005$

Means for Paired Comparisons

	Christian		Jewish	
	Introvert	Extrovert	Introvert	Extrovert
Ninth grade	1.375	2.0	1.75	1.625
Twelfth grade	2.1	2.92	2.2	1.33

TABLE 6

Frequency of Wine and Beer Use during the Past Year by Grade, Religion (Rel), Degree of Religious Commitment (Deg), and Extroversion-Introversion (EI)

Source	SS	df	MS	F
Grade	3.02	1	3.02	2.37
Rel	.34	1	.34	.27
Deg	10.36	2	5.18	4.07*
EI	1.11	2	.56	.44
Grade x Rel	1.77	1	1.77	1.39
Grade x Deg	.17	2	.08	.07
Grade x EI	.18	2	.09	.07
Rel x Deg	3.82	2	1.91	1.50
Rel x EI	14.11	2	7.05	5.45**
Deg x EI	9.94	4	2.48	1.95
Grade x Rel x Deg	3.83	2	1.91	1.01
Grade x Rel x EI	7.59	2	3.79	1.50
Grade x Deg x EI	13.56	4	3.39	2.98
Rel x Deg x EI	9.29	4	2.32	2.66*
Explained	75.71	31	2.44	1.82
Residual	99.29	78	1.27	1.92
Total	174.99	109	1.61	

*$p < .05$
**$p < .01$

Means for Paired Comparisons

	Christian	Jewish
I	1.71	1.70
E	2.59	1.79

		Ninth	Twelfth
High Deg	I	3.00	2.4
	E	1.75	2.6
Moderate Deg	I	1.67	2.29
	E	1.83	2.67
Low Deg	I	1.33	1.00
	E	1.33	2.57

Non-ritual wine and beer were used differentially by various groups, with grade, degree of religious commitment, and extroversion all interacting ($F_{3,76} = 3.57$, $p < .018$). The results of this analysis of variance appear in Table 8. Ninth-graders as a whole tended not to use wine or beer at parties ($F_{1,67} = 10.71$, $p < .002$), but this was modified by the other two variables. Extroverted twelfth-graders ($F_{1,67} = 16.07$, $p < .001$) with low religious commitment tended to use wine or beer with others, either in small groups or at parties, whereas their ninth-grade counterparts used it when they were alone. Ninth-grade introverts with low religious commitment also used wine or beer significantly more often with others in small groups than did their extroverted counterparts who used it alone ($F_{1,67} = 7.36$, $p < .01$).

The percentages of subjects who used beer or wine alone, in small groups, or at parties are given in Table 7. Upon analyzing the amounts of wine and beer consumed during the past month, the results showed that Jews drank significantly less beer than Christians ($F_{1,74} = 7.75$, $p < .007$), with Jewish users drinking an average of 0-2 cans of beer and Christian users drinking an average of 4-5 cans of beer during the past month. Introverts drank less beer than extroverts ($F_{2,74} = 3.34$, $p < .041$), with introverts consuming about 1 can per month versus about 3 cans for the extroverts. Grade was not related to the amount of beer drunk, but it was related to the amount of wine drunk during the past month, with ninth-graders drinking less than twelfth-graders ($F_{1,76} = 5.18$, $p < .026$).

The analysis of variance for ritual wine use appears in Table 9. Wine was used most frequently in conjunction with religious rituals

TABLE 7

Primary Setting of Drug Use (%)

	Alone	With One or Two Friends, or in Small Group	At Parties
Wine or Beer	14	53	33
Liquor	8	44	48
Marijuana	6	88	6
Hallucinogens	18	73	9

TABLE 8

Setting in which Wine was Most Frequently Used by Grade, Religion (Rel), Degree of Religious Commitment (Deg) and Extroversion-Introversion (EI)

Source	SS	df	MS	F
Grade	4.09	1	4.09	10.71**
Rel	.98	1	.98	2.57
Deg	.35	2	.18	.46
EI	.46	2	.23	.61
Grade x Rel	.04	1	.04	.09
Grade x Deg	.04	2	.02	.06
Grade x EI	.67	2	.34	.88
Rel x Deg	.72	2	.34	.94
Rel x EI	.90	2	.45	1.18
Deg x EI	1.36	4	.34	.89
Grade x Rel x Deg	.18	2	.09	.23
Grade x Rel x EI	1.44	2	.72	1.88
Grade x Deg x EI	4.09	3	1.36	3.57*
Rel x Deg x EI	.20	2	.10	.26
Explained	17.04	28	.61	1.59
Residual	25.59	67	.38	
Total	42.63	95	.45	

*$p < .02$
**$p < .002$

Means for Paired Comparisons

		Ninth grade	Twelfth grade
High Deg	I	-	.5
	E	1.0	1.25
Moderate Deg	I	0	1.57
	E	1.0	1.16
Low Deg	I	1.13	1.14
	E	0	1.71

TABLE 9

Percent of Wine Used Ritually by Grade, Religion (Rel), Degree of Religious Commitment (Deg) and Extroversion-Introversion (EI)

Source	SS	df	MS	F
Grade	3.00	1	3.00	3.04
Rel	67.79	1	67.79	68.88***
Deg	18.88	2	9.44	9.59***
EI	.48	2	.24	.25
Grade x Rel	6.66	1	6.66	6.77**
Grade x Deg	7.38	2	3.69	3.75*
Grade x EI	2.73	2	1.37	1.39
Rel x Deg	6.53	2	3.26	3.32
Rel x EI	4.59	2	2.29	2.33
Deg x EI	12.50	4	3.13	3.18**
Grade x Rel x Deg	1.32	2	.66	.67
Grade x Rel x EI	.92	2	.50	.47
Grade x Deg x EI	.58	4	.14	.15
Rel x Deg x EI	10.14	4	2.53	2.58*
Explained	241.61	31	7.79	7.92***
Residual	74.79	76	.98	
Total	316.41	107	2.96	

*p .05
**p .02
***p .001

Means for Paired Comparisons

		Degree			Grade	
		High	Moderate	Low	Ninth	Twelfth
Christian	I	2.0	0	.08	.33	.15
	E	0	0	.10		
Jewish	I	3.8	1.6	1.25	2.99	2.52
	E	2.86	2.5	4.00		
Ninth		2.99	1.87	1.76		
Twelfth		2.74	1.67	.14		

by those with the highest religious commitment ($F_{2,76} = 9.59$, $p < .001$), as was expected, and by Jews ($F_{1,76} = 68.88$, $p < .0001$). The variance accounted for by religion in ritual use of wine was 52%. Subjects with high religious commitment used wine more often for ritual purposes than did moderately religious ($F_{2,76} = 9.84$, $p < .02$ for ninth-graders; $F_{2,76} = 11.61$, $p < .001$ for twelfth-graders) or minimally religious subjects ($F_{2,76} = 25.69$, $p < .001$). Jews used wine ritually significantly more often than did Christians regardless of grade ($F_{1,76} = 68.78$, $p < .0001$) even though ninth-graders as a whole used wine ritually more often than did twelfth-graders ($F_{1,76} = 6.76$, $p < .011$). Twelfth-graders with minimal religious commitment used wine ritually less often than any other group ($F_{2,76} = 25.69$, $p < .001$). In addition, religion, degree of religious observance and extroversion all interacted, resulting in introverts being differentiated according to religious observance in use of ritual wine. Orthodox Jews as a group used wine ritually more than three times as often as did Reform Jews as a group, and used wine ritually more often than both Conservative Jews ($F_{2,76} = 12.30$, $p < .02$) or Reform Jewish introverts ($F_{2,76} = 14.68$, $p < .02$). Although Orthodox Jewish introverts nearly always used wine for ritual purposes, Orthodox extroverts used it 25-50% of the time for non-ritual purposes. Highly-committed Christian introverts used wine ritually more often than any other group of Christians ($F_{2,76} = 2.72$, $p < .05$) but less often than did Orthodox Jewish introverts ($F_{1,76} = 2.72$, $p < .05$). Other Christians almost never used wine for ritual purposes.

Liquor

The analysis of variance for frequency of liquor use during the past month appears in Table 10. There were significant main effects for grade ($F_{1,77} = 4.68$, $p < .034$) and religion ($F_{1,77} = 4.67$, $p < .034$) on frequency of liquor use during the past month. Twelfth-graders drank liquor nearly twice as often as did ninth-graders, and Christians drank nearly twice as often as did Jews. Grade and religion showed main effects on the amount of liquor drunk during the past month, indicating that ninth-graders drank less than half the amount drunk by twelfth-graders, and Jews drank less than 5% the amount drunk by Christians. These main effects were tempered by religion and degree of religious commitment interacting. Thus, moderately religious Christians drank five times the amount of liquor drunk by their Jewish counterparts ($F_{2,75} = 10.56$, $p < .02$). Furthermore, grade, degree of religious observance, and extroversion all interacted, resulting in significant differences in the amount of liquor use among ninth-graders, with extroverts of minimal religious commitment drinking significantly more than any other ninth-graders ($F_{2,75} = 7.83$, $p < .05$). Although use by this group of ninth-grade extroverts averaged only once or twice a month, it was more than 10 times higher than the frequency of use by any other introverts in the same grade. The analysis of variance for frequency of becoming intoxicated appears in Table 11, and shows that ninth-graders became drunk significantly less often than did twelfth-graders ($F_{1,71} = 4.15$, $p < .045$). Christian extroverts got drunk more frequently than did Jewish extroverts ($F_{1,71} = 29.68$, $p < .001$); moderately religious introverts got drunk more frequently than

TABLE 10

Amount of Liquor Consumption per Month by Grade, Religion (Rel), Degree of Religious Commitment (Deg), and Extroversion-Introversion (EI)

Source	SS	df	MS	F
Grade	6.68	1	6.68	7.92**
Rel	4.69	1	4.69	5.56*
Deg	.07	2	.04	.04
EI	4.09	2	2.04	2.42
Grade x Rel	.60	1	.60	.71
Grade x Deg	2.20	2	1.10	1.31
Grade x EI	2.09	2	1.04	1.24
Rel x Deg	5.27	2	2.63	3.12
Rel x EI	4.03	2	2.02	2.39
Deg x EI	2.25	4	.56	.67
Grade x Rel x Deg	.15	2	.08	.09
Grade x Rel x EI	2.57	2	1.29	1.53
Grade x Deg x EI	8.84	4	2.21	2.62*
Rel x Deg x EI	5.79	4	1.45	1.72
Explained	48.23	31	1.56	1.85*
Residual	63.25	75	.84	
Total	111.48	106	1.05	

*$p < .05$
**$p < .01$

Means for Paired Comparisons

		Ninth grade	Twelfth grade	Christian	Jewish
High Deg	I	0	.4	.69	.65
	E	.5	1.2		
Moderate Deg	I	0	1.3	1.24	.25
	E	.2	1.5		
Low Deg	I	.1	.75	.97	.50
	E	1.75	1.43		

TABLE 11

Number of Times Intoxicated during Past Year by Grade, Religion (Rel), Degree of Religious Commitment (Deg) and Extroversion-Introversion (EI)

Source	SS	df	MS	F
Grade	4.03	1	4.03	4.15*
Rel	4.80	1	4.80	4.95*
Deg	3.21	2	1.60	1.65
EI	8.68	2	4.34	4.47*
Grade x Rel	1.17	1	1.17	1.21
Grade x Deg	1.12	2	.56	.58
Grade x EI	.52	2	.26	.77
Rel x Deg	1.56	2	.78	.80
Rel x EI	12.07	2	6.04	6.22**
Deg x EI	14.56	4	3.64	3.75**
Grade x Rel x Deg	5.01	2	2.51	2.58
Grade x Rel x EI	1.17	2	.58	.60
Grade x Deg x EI	3.61	4	.90	.93
Rel x Deg x EI	4.55	4	1.14	1.17
Explained	73.64	31	2.38	2.45**
Residual	68.96	71	.97	
Total	142.60	102	1.40	

*$p < .05$
**$p < .008$

Means for Paired Comparisons

	Degree		
	High	Moderate	Low
I	.29	2.11	1.29
E	.86	1.0	2.18

	Christian	Jewish
I	1.47	1.08
E	2.25	.38

did highly religious introverts ($F_{2,71}$ = 13.49, p <.02), or moderately religious extroverts ($F_{1,71}$ = 6.28, p <.05); and both minimally religious extroverts and moderately religious extroverts got drunk less frequently than did minimally religious extroverts ($F_{1,71}$ = 5.16, p <.05 and $F_{2,71}$ = 7.88, p <.05, respectively).

The analysis of variance for the degree of intoxication generally attained while drinking appears in Table 12. Grade, religion, and degree of religious commitment all interacted in determining how intoxicated a person usually became when he drank alcohol ($F_{2,70}$ = 5.24, p <.008). Among twelfth-graders, Conservative Jews became more intoxicated than did the Orthodox Jews ($F_{2,70}$ = 9.05, p <.03), and Christians of minimal religious commitment became more intoxicated than both Orthodox Jews ($F_{2,70}$ = 16.10, p <.01) and Christians with high religious commitment ($F_{2,70}$ = 4.65, p <.05). Among ninth-graders, Orthodox and Conservative Jews indicated becoming significantly less high than did the Reform Jews ($F_{2,70}$ = 32.88, p <.01), and the Orthodox Jews also indicated becoming less high than did Christians of moderate religious commitment ($F_{2,70}$ = 5.36, p <.05). Among ninth-graders who had least religious commitment, Christians became less intoxicated than did Jews ($F_{2,70}$ = 22.09, p <.01), with Christians tending to get a little high and Jews tending to get drunk or to pass out.

There were no significant differences in the extroversion scores of persons who used only wine, only beer, wine and beer but not liquor, liquor only, or all three forms of alcohol ($F_{4,104}$ = 1.22, p <.30).

TABLE 12

Typical Degree of Intoxication Reached when Drinking by Grade, Religion (Rel), Degree of Religious Commitment (Deg), and Extroversion-Introversion (EI)

Source	SS	df	MS	F
		1		
Grade	2.08	1	2.08	2.41
Rel	.80	1	.80	.93
Deg	20.75	2	10.37	12.06**
EI	5.06	2	2.53	2.94
Grade x Rel	.90	1	.90	1.04
Grade x Deg	.87	2	.44	.51
Grade x EI	1.22	2	.61	.71
Rel x Deg	14.41	2	7.21	8.38**
Rel x EI	1.45	2	.73	.84
Deg x EI	4.03	4	1.01	1.17
Grade x Rel x Deg	9.02	2	4.51	5.24*
Grade x Rel x EI	1.71	2	.85	.99
Grade x Deg x EI	1.86	3	.62	.72
Rel x Deg x EI	1.34	4	.33	.39
Explained	73.87	31	2.38	2.77**
Residual	60.21	70	.86	
Total	134.08	101	1.33	

*$p < .01$
**$p < .001$

Means for Paired Comparisons

		Ninth grade	Twelfth grade
Christian	High Deg	1.0	.8
	Moderate Deg	1.25	1.25
	Low Deg	1.08	1.8
Jewish	High Deg	.22	.46
	Moderate Deg	.29	1.67
	Low Deg	3.4	1.0

Marijuana or Hashish

The results of the χ^2 analyses of marijuana or hashish use by grade, religion, degree of religious commitment and extroversion score revealed that there were significantly more twelfth-graders than ninth-graders ($\chi^2_1 = 14.28$, $p < .0002$), more Christians than Jews ($\chi^2_1 = 4.69$, $p < .03$), and more minimally religiously-affiliated than highly affiliated subjects ($\chi^2_2 = 7.74$, $p < .02$) who had ever used marijuana or hashish.

Analyses of variance were done on frequencies of marijuana use during the past month and during the past year. They indicated that frequency of use declined with grade, such that ninth-graders used marijuana significantly more often during the past month ($F_{1,28} = 8.71$, $p < .006$) and during the past year ($F_{1,29} = 10.12$, $p < .003$) than did twelfth-graders. Ninth-grade users of marijuana smoked it about 3-4 times a month over the past year and over the past month, whereas twelfth-graders used it about 1.5-2 times during the past year, but only once a month or less during the preceding month. This suggested that marijuana use declined during the senior year in high school, or shortly before. Frequency of use was not related to religion, degree of religious commitment or extroversion.

The reasons subjects used each drug are listed in Table 13. Subjects indicated that there were numerous reasons that they use marijuana, and many subjects use it for more than one reason. Of the 51 subjects who had used the drug, 60% used it as a means of experimenting, and 70% used it to feel good, to get high, or to have fun. Thirty-two percent used marijuana to relax, to relieve tension or to escape from

TABLE 13

Ascribed Reasons for Drug Use (% Total)

Reasons	Most Important Reasons				All Reasons			
	Marijuana	Hallucinogens	Stimulants	Depressants	Marijuana	Hallucinogens	Stimulants	Depressants
Experimentation	28	55	25	33	60	69	65	68
Feel good, get high, have fun	61	27	44	47	68	62	47	53
Have good time with friends, fit in with desirable group	9	9	19	13	8	15	18	21
Rebellion	2	9	13	7	2	23	18	11
Relax, relieve tension, escape	63	50	27	60	32	46	29	68
Seek insights, understanding	26	20	27	13	30	23	24	42
Boredom relief	5	30	27	7	30	31	24	26
Interact with other drugs	5	-	9	13	4	15	29	21

their anger, problems or frustration, and 30% used it to seek insights or understanding, and/or to relieve boredom. Less than 10% of the subjects used marijuana to have a good time with their friends, to fit in with a group they liked, to rebel against someone who did not want them to use it, or to interact with other drugs. The primary reasons that subjects said they used the drug were to feel good, to get high, or to experiment.

The analyses of variance showed no differences between extroverts and introverts in how they used marijuana--whether they tended to use it when they were by themselves, with one or two friends or in a small group, or at a party ($F_{1,49} = .08$, $p > .05$). How marijuana was used was not related to religion, degree of religious affiliation, nor to grade. As can be seen in Table 7, subjects used marijuana most frequently with one or two friends or in a small group, next most frequently at parties, and least frequently alone. About two-thirds of the marijuana users tended to get moderately high or very high from the drug, and users were fairly evenly divided in their reports that they did not or barely enjoyed marijuana, enjoyed it somewhat, or enjoyed it very much with about one-third of the subjects responding in each category.

Thirty-seven percent of the subjects who had used marijuana used drugs in such a way that they overlapped with effects of alcohol at least 10% of the time, and 33% used non-alcoholic drugs in interacting ways with the same frequency. These tendencies to use overlapping drugs, however, were not related to the extroversion or introversion of the individual, nor to religion, grade, or to degree of religious

commitment.

Seventy percent of the subjects who had used marijuana had first used some form of alcohol (not as a part of religious services) prior to using marijuana. This finding was consistent with the theory that alcohol use precedes use of illegal drugs, particularly marijuana.

Hallucinogens

There were no significant main effects or interactions between any use and frequency of use of hallucinogens, and religion, degree of religious commitment or extroversion-introversion. Only 14 subjects had used hallucinogens during the past year, and only 12 had used them during the previous month. Thus, any differences which were present may not have been detectable due to the small sample size.

The majority of subjects used hallucinogens twice a month or less, as can be seen in Table 3. Significant differences were found in the way in which LSD was used--females used it most frequently with others in a small group or at parties, and males used it most frequently when they were alone or in a small group ($F_{1,6} = 14.29$, $p < .009$). Also, sex accounted for 25% of the variance in how hallucinogens were used. Introverts used it most frequently when they were alone or in a small group and extroverts used it mainly when they were at parties, or occasionally in a small group ($F_{2,6} = 9.21$, $p < .015$). Introversion-extroversion accounted for 37% of the variance in how hallucinogens were used. Of the subjects who used LSD or other hallucinogens, 69% used them to experiment, to feel good, or to have fun, and nearly half used them to relax or escape. They were infrequently used to have a

good time with friends or to fit in with a group, to rebel, or to interact with other drugs. The primary reasons given for their use was to experiment or to have fun. These reasons for use are listed in Table 13.

Most subjects used hallucinogens in the same way that marijuana was used--i.e., 73% of them used it when they were with one or two others or in a small group. It was seldom used either alone or at parties (See Table 7).

Stimulants

Use of amphetamines was significantly related to degree of religious commitment ($\chi^2_2 = 7.75$, $p < .02$). The lower the degree of religious commitment, the greater the chance that a subject had ever tried amphetamines or other stimulants. Frequency of use of stimulants was also related to one's grade interacting with one's religious commitment ($F_{1,6} = 9.37$, $p < .02$) and with one's degree of extroversion or introversion ($F_{1,6} = 6.12$, $p < .048$), but the sample size was too small to analyze the interactions, resulting in an empty cell.

Frequency counts of the frequency of use are found in Table 3. Among current users of stimulants, average use was fairly evenly divided into the categories of less than or equal to once a month, 2-3 times per month, or once a week. About one-third of those who had tried the drug had not used it at all during the past month, and had probably been intermittent users over the past year.

The reasons for use of stimulants are listed in Table 13. Of the 17 subjects who had used stimulants, most used them to experiment,

and about half used them to have energy, to feel good, to get high, or to have fun.

When subjects who had used stimulants were compared with those who had used depressants, it was found that only 4 subjects had used both. When the extroversion scores of subjects who had used either stimulants or depressants or both were compared, no significant differences resulted ($F_{2,19} = .06$, $p < .94$).

Tranquilizers, Sedatives and Depressants

Use of depressants was related to degree of religious commitment ($\chi^2_2 = 6.61$, $p < .037$), but not to any other variables. The lower the degree of religious affiliation, the greater the chance that the person had ever used tranquilizers, sedatives, barbiturates and the like for non-medical purposes. Slightly more than half of the subjects indicated that they had used depressants less than once a month during the past year, and 18% indicated either that they had not used the drugs at all during the previous year, or that their average use was 2-3 times per month. Over two-thirds of those who had tried depressants had not used them at all during the previous month, and 18% had used them 2-3 times during that period. These results are presented in Table 3.

The reasons depressants were used are listed in Table 13. The majority of those who used these drugs did so to experiment and/or to relax, relieve tension and escape from their troubles. About half of the users took the drugs to feel good or to have fun, or to seek insights. The primary reason for using the drug was to relax or to

escape, but using the drug to feel good or to have fun was also an important motive.

Relationships Between Variables

When the extoversion scores of subjects of different degrees of religious observance were compared, no significant differences resulted, although significance was approached ($F_{2,136} = 2.72$, $p < .069$).

Nonparametric correlations (Spearman's rho) were done between frequency of use of each drug during the previous year and during the previous month, and these appear in Table 14. With the exception of depressants, there were very high correlations (.78-.90) between use of each drug during the past year and past month.

In order to see if the present results replicated those of Kandel and Faust, Hamburg et al., and Wechsler, correlations were also calculated between amounts of alcohol consumed, intoxication tendencies and use or frequency of use of higher-level drugs. These correlations also appear in Table 14. There were significantly high correlations between the amount of liquor or beer drunk, and use of marijuana, hallucinogens and pills. The degree of alcohol intoxication generally attained and the number of times one became drunk during the past year were also highly related to use of higher-level drugs. Use of hallucinogens and pills were all highly intercorrelated. Virtually without exception, if one had never used beer or wine, he had also abstained from all other drug use. If one had abstained from use of pills, he tended also to have abstained from use of hallucinogens. Users of hallucinogens, however, tended to use stimulants, and to a lesser extent, depressants.

Table 14

Significant Correlations Between Drugs Used

	Amt. beer per month	Freq. wine/beer use per month	Amt. liquor use per month	Freq. liquor use per month	Degree of intoxication	Freq. of intoxication	Freq. marijuana use per month
Ever used beer or wine					.17*		
Freq. beer or wine use/year		.88***					
Amt. beer use/month					.50***	.61***	
Amt. wine use/month			.41***				
Amt. liquor use/month	.58***			.87***	.35***		
Ever used marijuana						.64***	
Freq. marijuana use/year							.90***
Ever used hallucinogens	.30***		.18*		.40***	.44***	
Freq. hallucinogens use/year							
Ever used stimulants	.34***		.22*		.42***	.47***	
Freq. stimulant use/month					.51*		
Freq. stimulant use/year			.45*				
Ever used depressants	.23**		.24**		.31***	.41***	
Freq. depressant use/year					.63***	.39*	
Degree of intoxication						.68***	
Intensity of marijuana high						.36***	

*p <.05 **p <.01 ***p <.001

Table 14 (Con't)

Significant Correlations Between Drugs Used

	Freq. hallucinogens use per month	Freq. stimulant use per month	Freq. depressant use per month	Intensity of marijuana high	Ever used marijuana	Ever used stimulants	Ever used depressants
Ever used beer or wine					.29***	.23**	.19**
Freq. beer or wine use/year							
Amt. beer use/month					.54***		
Amt. wine use/month				-.25*			
Amt. liquor use/month					.43***		
Ever used marijuana							.40***
Freq. marijuana use/year							
Ever used hallucinogens				.52***	.34***	.47***	
Freq. hallucinogens use/year	.78***		.66*				
Ever used stimulants				.50***		.65***	.68***
Freq. stimulant use/month			.67**			.31***	
Freq. stimulant use/year		.83***	.58*				
Ever used depressants				.28*	.38***		
Freq. depressant use/year			.51*		.54**		
Degree of intoxication				.44***	.53***		
Intensity of marijuana high			.47*				

*p <.05 **p <.01 ***p <.001

Correlations between use of marijuana and getting very high on marijuana, and use of stimulants were also high, indicating that many subjects who used marijuana, and particularly those who used it intensely, also had tried stimulants. On the other hand, frequency of use of stimulants was not related to use of marijuana, probably because many of these subjects used stimulants intermittently, or merely tried them to satisfy their curiosity.

DISCUSSION

The results of the present study are, in many respects, consistent with those of earlier studies in the area of drug and alcohol use. The high intercorrelations between intensity of alcohol use and use of higher-level drugs, and the tendency of those who used one drug intensely to use hallucinogens and/or pills were consistent with the results of studies by Wells and Stacey (1976), Wechsler (1976), Kandel and Faust (1976) and Hamburg et al. (1976). This may be interpreted to mean that, in general, adolescent drug users do follow certain patterns of use when they become involved with both alcohol and other drugs. Due to the nature of the present population sampled, the percentages of subjects who used various drugs were somewhat lower than those in the populations of Kandel and Faust (1976) and Hamburg et al. (1976), but the patterns of use which were followed by the present population as a whole seem to parallel those found by other researchers in different geographical locations, and with subjects of different ages, religions and socioeconomic backgrounds.

Overall, the majority of the subjects in the present study had used beer, wine or liquor, roughly one-third had used marijuana, and 10-16% had used hallucinogens or pills. This compares with the majority of the subjects in the populations tested by Kandel and Faust and Hamburg et al. having also used some form of alcohol, and 12-20% of the subjects in Hamburg et al.'s sample having used hallucinogens or

pills. Roughly 6% of the subjects in Kandel and Faust's study had used hallucinogens, pills, cannabis and alcohol. Among the public school students alone, the percentage of alcohol users in the present study was probably slightly lower than for the present sample as a whole, and the use of illicit drugs was probably higher than for the sample as a whole.

In addition to the above patterns of use, it was found in the present study that increases in grade in school were paralleled by increases in the numbers of subjects who had used wine, beer, liquor or marijuana, but there were no relationships between grade and use of higher drugs such as hallucinogens or pills. Although these findings did not support the results of Hamburg et al. (1976) and Kandel and Faust (1976), in that their subjects increased use of all drugs with age, they should not be interpreted as contradicting the findings in other studies. Rather, this inconsistency is probably due to the relatively small number of users of these higher-level drugs in the present study. One unique finding of the present study which was not discussed by the other researchers is that although the number of students who have tried marijuana and alcohol increases by grade in school, the frequency of use of marijuana actually declined during the senior year in high school. The occurrence of this phenomenon lends itself to the following explanation--that since marijuana use, as use of other drugs, was motivated in large part by a desire for experimentation, the novelty effects had probably worn off by twelfth grade. It is noteworthy that only one-third of those who had used marijuana enjoyed using it very much. Those who did not particularly

enjoy using marijuana may have reduced their use of it and tried other drugs instead, or they may simply have discontinued their use of marijuana without using other drugs. Kandel and Faust indicated that in their sample 20% of the cannabis users regressed to legal drug use alone over a five-month period. It was primarily those subjects who used marijuana intensely in the present study who also tried using other drugs, and it seems reasonable to assume that those who did not enjoy using marijuana very much probably did not use it intensely. If that were the case, they probably did not use higher-level drugs when they discontinued marijuana use. After satisfying their curiosity during the early years of high school about what marijuana was like, subjects may have lost the desire to use marijuana. These subjects were probably never regular users. This possibility is supported by the fact that average use of marijuana over the previous year and previous month tended to occur at the extremes of the frequency scale --55-60% of the subjects used marijuana an average of once a month or less, and 31-34% used it more often than once a week. Thus, it seems plausible that many subjects try marijuana for curiosity purposes and/or use it infrequently, but they discontinue its use as they grow older. Those subjects who use marijuana intensely, however, have an increased tendency to try higher-level drugs, and this phenomenon is consistent with the hypothesis that drug users are often sensation-seekers (Zuckerman et al., 1972). A drug user may ascend the drug hierarchy until he reaches a state of equilibrium for his sensation-seeking needs, and this hypothesis should receive further empirical investigation. Kandel and Faust found that the higher the level of

initial use of any drug, the more apt the adolescent was to change his pattern of drug use over time. When a user reaches equilibrium, he may continue at the same rate of drug use for a while and then turn to other types of sensational experiences, or may become addicted due to the high frequency of use.

Kandel and Faust's theory of hierarchical drug use was also supported by the finding that most subjects in the present study (70%) had used some type of alcohol (excluding wine used for ritual purposes) prior to using marijuana. On the other hand, Kandel and Faust emphasized that only 1% of the subjects in their sample had gone directly to cannabis use without using legal drugs first. Approximately 5% of the subjects in Kandel and Faust's study used cigarettes as the intermediary drug between abstention from and use of marijuana, but this is still quite a difference from the 30% in the present sample who had not used alcohol prior to using marijuana. These findings weaken the theory that the two stages of legal drugs are "necessary" intermediaries between abstention from drug use and use of marijuana. Perhaps, as was suggested by Zuckerman et al. (1972), marijuana use has become so commonplace and acceptable today that many subjects no longer find it necessary to bridge a gap between abstention from drug use and use of marijuana by first using alcohol.

With regard to the present study, most of the hypotheses which were initially made were not upheld. Unexpectedly, use of drugs other than alcohol, use of overlapping drugs, and the frequency of use of each drug was not related to the extroversion or introversion tendencies of the individual, nor to grade (except for marijuana, which was

negatively related), nor to religion. That is, users of low-level drugs such as alcohol did not have lower extroversion scores than did users of high-level drugs, such as pills. It was anticipated that since the median age of using pills and hallucinogens was 17 or older (Hamburg et al., 1976), those subjects in the present population who used these high-level drugs would be particularly extroverted as compared with nonusers of drugs, or users of low-level drugs only. Apparently, there are many other factors in addition to extroversion which predispose freshmen or seniors to using these high-level drugs. The introvert may use these drugs to experiment, to relieve boredom, to escape from problems or to relax or relieve tension as frequently as will an extrovert. The introvert may also use these drugs as a means of overcoming his introspective and solitary tendencies. In any event, one's extroversion tendencies during high school are not the primary factor in predisposing adolescents to stimulant and hallucinogen use, nor are introversion tendencies the primary factor in predisposing to sedative use. Here again, the small number of users could account for these results. In fact, rather than introverts using sedatives and extroverts using stimulants as was initially anticipated, subjects who used amphetamines often used sedatives as well, and to a lesser extent, sedative users often used stimulants, so that both types of pills were frequently used by the same people. Multiple drug use and the small number of users could account for the lack of relationship found.

Propensities to thrill-seeking, as discussed by Holroyd and Kahn (1974) and Zuckerman et al. (1964), rather than extroversion <u>per se</u>,

are probably more important factors in determining frequency and level of drug use or use of overlapping drugs, contrary to the expectation based on Eysenck's theory of extroversion (1957). Alternatively, it is conceivable that the cutoff points used in the present study may not have adequately delineated an "introverted" group, such that the introverts used in the present study may have been equivalent to persons with low average scores in other populations. Had a different control group of "true introverts" been used, more pronounced differences may have been obtained between the extroversion of drug users and introversion of drug abstainers. In any case, it is highly unlikely that introverts would use more depressants than would extroverts in the adolescent population because the primary reason for the use of sedatives is to relax, relieve tension and/or escape from problems, which could just as easily motivate extroverts with psychic stress to use them as motivate introverts to use them.

Even though extroversion was not significantly related to most drug use, it was related to alcohol use. Specifically, twelfth-grade extroverts had a greater probability of being frequent drinkers of beer or wine than did others, especially when these extroverts were Christian. This was expected, since extroverts may not significantly manifest their social tendencies through drinking until they reach a given age, which probably begins somewhere between ninth and twelfth grades. Christians in this category would also be expected to drink alcohol more frequently than would Jews, since Christians in general lack the religious and cultural norms which discourage social drinking by Jews.

The hypotheses made in the present study, that Jewish introverts would use wine for religious ritual purposes more frequently than any other group, was supported. Eysenck's (1957) theory can be used to explain this phenomenon by saying that the Jewish introvert has been highly conditioned to observe the Jewish rituals involving use of wine. In addition, the introvert would not be particularly prone to being in social situations where wine or other alcohol would be used for nonreligious purposes. Interestingly, Orthodox Jewish extroverts who presumably would be less conditioned to having unpleasant reactions at the thought of using wine for secular purposes, used wine in non-ritual contexts 25-50% of the time that they used wine, further lending support to Eysenck's hypothesis.

It was shown that introversion, in conjunction with religious norms prescribing use of alcohol for religious rituals, were both necessary for the subject to drink almost exclusively for ritual purposes. Although religiously committed introverts of both religions used wine ritually more than did others within their religion, Jews of almost every combination of extroversion or introversion and different degrees of religious commitment drank wine ritually more often than did their Christian counterparts. Thus, it was the Jewish norms _per se_ which were the primary factors influencing the patterns of alcohol use among Jews, just as was noted by Skolnick (1958). These patterns, which include frequent use of ritual wine and low use of other forms of alcohol, were magnified when a person was introverted. Furthermore, the religious norms surrounding alcohol use may not even be operative without minimal religious affiliation or commitment. When

compared with Christians, however, Jews of all degrees of religious commitment drank significantly less beer than did their Christian counterparts, although only Jews of moderate religious commitment drank significantly less liquor than did their Christian counterparts.

With the exception of wine being used ritually most frequently by introverts, it was the extroverts who tended to use significantly more beer and liquor than did others, and this effect was magnified by increasing age and moderate-to-low religious commitment. In general, the profile of the adolescent who would be most likely to use alcohol nonritually, and to get intoxicated more frequently than anyone else would be a Christian extrovert, of minimal religious commitment, who was a senior in high school. In addition, the ninth-grade Reform Jews indicated that they tended to get drunk or to pass out when alcohol was used, even though four of the five subjects in this category indicated getting drunk less than twice during the past year. If it were true that these subjects typically got drunk or passed out when drinking, they would have had to have gotten drunk more frequently than once or twice during the past year, inasmuch as four of the five subjects were using at least wine, and sometimes liquor as well, once a month or more. What is noteworthy is that all of the subjects in this category indicated that they typically achieve a high degree of intoxication despite the fact that this would be inconsistent with their other responses. In their perception, at least, alcohol results in deep intoxication. If this were truly the case, they may be reluctant to indicate that they frequently became drunk. On the other hand, they may describe themselves as getting

drunk or passing out, which is what other people mean by saying they became a little high or moderately high. This may be a product of the Jewish bias against drinking, which would frown upon even minimal drinking by adolescents for social purposes, or at least for nonritual purposes.

Paradoxically, when asked how often they became drunk during the past year, they may have decided that their perceptions of being drunk were not those of the researcher, or they may have toned down their responses in order not to present themselves any more unfavorably to the researcher.

There did not seem to be any one pattern of alcohol or drug use among the ninth-grade Reform Jews. But, it does seem that the Christian extrovert and the Reform Jew use alcohol and become intoxicated for different reasons, though. The Christian extrovert of minimal religious commitment has the fewest religious or social proscriptions against using alcohol, coupled with what may be a physiological or psychological makeup which requires external stimulation. Thus, it is relatively easy, acceptable and/or gratifying for such a person to drink and to become moderately high while drinking. The Reform ninth-graders, on the other hand, may just recently be entering social situations in which wine and liquor are drunk socially. It is likely that within the prior year or two these subjects have actually become drunk at least once a year. Considering that bar mitzvahs occur at age 13, and alcohol is usually freely available to everyone present, these subjects may begin using alcohol during this time and shortly thereafter. They could easily get drunk at bar mitzvah receptions as

a means of showing how "grown up" they are, almost as a rite of passage, and would probably undergo no social or family complications for so doing. Additionally, they could easily get intoxicated on wine at the annual Passover ritual, and events such as this may be impressed on their memories more vividly than the cursory use of wine at dinner. The other alternative to these explanations is that the subjects in this category simply wanted to impress the experimenter with how experienced they were with using alcohol. Part of this may be a way of showing rebellion against the norms of self-control with alcohol used by Jews.

Most of the main effects and interactions in the present study occurred with the use of alcohol and grade, religion, degree of religious commitment and extroversion. The propensity of religiously committed individuals to abstain from marijuana use probably accounted for the fact that Jews used less marijuana than did Christians. The present sample had a much higher proportion of religiously observant subjects among the Jews than among the Christians. With the exception of marijuana and alcohol, Jews and Christians tended to use drugs in the same frequencies and ways. Alcohol use by Jews, however, was strikingly different than by Christians. In general, Jews avoided getting high on alcohol (or at least avoided admitting getting high), whereas Christians tended to get a little to moderately-high when they drank. It seems, then, that for the Jew the norm regarding drinking is that you should not drink, but if you do, you should not get high. Surprisingly, Orthodox Jews did not use liquor less frequently than did other Jews, although they did describe themselves as becoming less

high than either Christians or other Jews. The high intoxication percentage among ninth-grade Reform Jews indicated either that they had rejected the social and religious norms prohibiting drinking to excess, or that they had not rebelled against the norms but had simply never learned how to drink without becoming intoxicated. Both of these situations probably occurred in different individuals. As a general rule, no norms were probably transmitted regarding how one drinks socially without becoming highly intoxicated, since it is assumed that "Jews don't drink anyhow," particularly when they are young. As these types of people grow older, they either learn to moderate their drinking so that they do not become intoxicated, or they consistently drink to achieve the high of alcohol use, in which case they will probably begin using higher-level drugs as well.

The highly religious introvert was least likely to become intoxicated to the point of drunkenness, and the moderately religious introvert and the minimally religious extrovert were most likely to get drunk. Their frequency of becoming drunk averaged once every few months. Paradoxically, the Jewish extrovert became drunk the least frequently, and Jewish and Christian introverts became drunk about equally often. Perhaps Jewish extroverts channeled their social and curiosity needs into areas which do not involve social drinking and intoxication, or perhaps they experienced getting drunk in the past at a relatively early age, and so this no longer provides a "sensational" experience to them.

In addition to the complex interactions noted above, the amount of liquor drunk during a typical month was also related to grade,

religious commitment and extroversion. Among ninth graders, minimally religious extroverts drank the most liquor, probably because drinking is a novel, forbidden experience for them, and they have few norms restraining them from drinking. Being extroverted, they seek novel and exciting experiences which are provided through both the physiological effects of the liquor and knowing that it is illegal for them to be drinking.

As a summary of the data on alcohol use, the only pattern which seemed to consistently emerge was that extroverts may have certain subgroups who used alcohol significantly more often than did their introverted counterparts. The results also underscored the importance of differentiating between how different types of alcohol were used--whether for religious ritual, to get drunk, or for use socially.

It did appear from the data gathered that the Jewish norms discouraging drinking are not part of more generalized norms specific to Judaism which discourage use of any drug which impairs self-control. The results also indicated, contrary to what was hypothesized, that religiously committed adolescents did not turn to use of sedatives more than did others. On the contrary, high religious commitment was related to the lowest levels of marijuana, stimulant, sedative and alcohol (nonritual) use. This was consistent with the findings of Hamburg et al. (1976) as well as with the hypothesis that those with the highest religious commitment would have the lowest frequencies of drug use, and lowest use of alcohol for purposes of intoxication. The hypothesis that subjects who were high in religious commitment would rarely be users of the highest levels of drugs (namely, pills and

hallucinogens) was upheld.

In general, although Jews and Christians did not differ in their extroversion-introversion scores, there was a trend for religiously committed individuals to be less extroverted than others. There were still some individuals with high religious commitment who had the desire or felt the need to seek external forms of stimulation, and did so. Thus, although religious commitment seems to be a deterrent to drug use, its presence is not a total barrier to involvement with drugs.

With regard to extroverts using drugs for different reasons than do introverts, this was generally not capable of being tested in the present study, due to the small number of high-level drug users. Introverts and extroverts were compared for marijuana use, but there were no differences between them in their motives for using the drug. For drugs in general, people tended to use them with one or two friends, or in a small group, and they seldom used them alone or at parties. Thus, drug use is a social activity, rather than being simply an activity to avoid boredom or simply to gain the effects of some drug. The present study corroborated results found in many other studies in that primary motivations to use drugs included relief from boredom, having fun, and experimentation (Jenkins, 1975; Kamali & Steer, 1976; West, 1975). It had been expected that extroverts would use drugs more frequently at parties than would others, but this was not the case, since drugs were seldom used at parties (except for twelfth-graders who used alcohol). The pattern which seems to emerge from this is that there are certain rules which govern drug use

regardless of one's grade or personality type. Since drugs are often used to relieve boredom or to have fun, it seems logical to assume that it is not the effects of the drug alone, but rather the effects of the drug when used with another person, which serve this function. In such a case, the drugs serve the purpose of providing an activity in which people can interact. Thus, it is the effects of the drug itself interacting with the social context which seem to motivate adolescents to use them.

In the case of hallucinogens, people seem to use them for different reasons than they use marijuana. Over half of the hallucinogen users used the drugs primarily to experiment, and about one-quarter of the people used the drugs to feel good, to get high, or to have fun. These proportions were reversed for those who used marijuana. These results could be viewed as being consistent with the findings of Khavari et al. (1977) who indicated that marijuana use was associated with a desire to seek out uninhibited modes of self-expression, whereas hallucinogen use was associated with extroversion and a need for social stimulation.

To the extent that a drug is being used primarily to experiment --and presumably, to experiment with a friend or two--it seems likely that if other equally stimulating, novel and dangerous experiences were available, an adolescent might not feel the desire to use a given drug. That is, for the subjects who are using LSD, pills or marijuana primarily because they are available agents with which one can experiment, it may be possible to dissaude them from drug use if they are provided with alternative experiences which are also thrilling,

challenging, or somewhat forbidden. These activities may include sports which can be engaged in with someone else, doing chemistry experiments or science projects with another, seeing horror films or going on dangerous rides at amusement parks, etc. However, emphasizing the dangers of drug use to such people is probably counterproductive, since the greater the danger involved, the more curiosity to experiment with it will probably result. On the other hand, those adolescents who use drugs specifically for the physiological effects they produce would be expected to be difficult to dissuade from drug use. They choose their drugs deliberately for the bodily effects that they produce, which are probably heightened by using them with someone else. For subjects who choose drugs for their qualities of inducing relaxation, massage and meditation may sometimes provide reasonable alternatives. Unfortunately, other than introducing adolescents to legal drugs as alternatives, it would seem highly unlikely that appropriate substitutes could be found for stimulants and hallucinogens. With the prevalence of legal and illegal drugs being what it is today, it seems somewhat naive to think that any drug program could effectively dissuade the average adolescent from at least trying various drugs. It does seem plausible, though, that at least certain individuals could be either dissuaded from any drug use, or distracted from regular drug use, if social situations and activities were made known to them in which they could satisfy their curiosity, have fun, feel good, relax, and escape from both their problems and their boredom. Introducing peer support groups, teaching means of coping with frustration and anxiety, and possibly even introducing

adolescents to progressive relaxation may help alleviate some of the need that certain individuals feel for using drugs as an escape. Teaching them how to have fun without using drugs may also be a useful step in beginning to tackle the problem of drug use by adolescents.

SUMMARY

The present study was designed to determine how religion, degree of religious commitment, and extroversion or introversion are related to hierarchical use of drugs and alcohol by adolescents. One hundred forty-four students from one public and two parochial schools in a large metropolitan area were administered the Eysenck Personality Inventory and a drug use questionnaire. The sample was comprised of Jews and Christians from ninth and twelfth grades who were of high, moderate or low religious commitment.

A number of hypotheses were made, including that Jews would use the least amount of alcohol, except for ritual wine use, and that introverts and subjects of high religious commitment would use drugs and alcohol least. Also, ninth-graders were expected to use fewer drugs than did twelfth-graders, and subjects were expected to use drugs in a hierarchical manner, as described by Kandel and Faust (1976) and by Hamburg et al. (1976).

It was found that Jews used wine ritually significantly more often than did Christians ($\underline{X}^2_1 = 7.55$, $\underline{p} < .006$) and that high religious commitment combined with introversion resulted in the highest use of wine for religious rituals for both Jews and Christians ($\underline{F}_{4,76} = 3.18$, $\underline{p} < .02$). Jews drank significantly less beer ($\underline{F}_{1,74} = 7.75$, $\underline{p} < .01$) and less liquor ($\underline{F}_{1,75} = 5.56$, $\underline{p} < .05$) than did Christians, and Christian extroverts drank the most beer and nonritual wine ($\underline{F}_{2,77} = 3.40$,

$p < .05$) and became intoxicated more frequently than any other group ($F_{2,71} = 6.22$, $p < .008$). However, extroverted ninth-graders of low religious commitment drank the most liquor ($F_{4,75} = 2.62$, $p < .05$), and Reform Jewish ninth-graders indicated attaining the highest level of intoxication during typical drinking ($F_{2,70} = 5.24$, $p < .01$). Also, subjects with high religious commitment used significantly less marijuana, stimulants or depressants than did others ($X^2_1 = 4.69$, 7.74 and 6.61, $p < .05$, respectively), but Jews tended to use drugs (other than alcohol) in the same way as did Christians.

Unexpectedly, among those who used marijuana, ninth-graders used it more frequently than did twelfth-graders. One-third of the marijuana users had not used alcohol prior to their first use of marijuana, thus casting doubt on the theory that illicit drug users must first use alcohol to bridge the gap between legal and illegal drugs.

In general, the interactions between introversion, extroversion, religion and use of alcohol were very complex. Overall, extroverts did not use significantly more pills or hallucinogens than did others, but this was probably due to the small number of users of these drugs in the present population. It was concluded that Jewish norms which govern the use of alcohol are responsible for the low use of nonritual alcohol among all Jews, regardless of degree of religious commitment, but that introversion and high religious commitment magnify this effect. Although there were no significant differences between extroversion scores of subjects with different degrees of religious commitment, there was a tendency for the highly committed to be more introverted than others. Thus, those with high religious commitment may have lower needs than do

others for external stimulation, and they may achieve the same goals as do drug users, albeit through participation in more conventional activities.

REFERENCES

Baskett, G. D. and Nyswander, R. W. Drug use correlates. Psychology, 1973, 10, 54-66.

Blum, R. Utopiates. New York: Atherton Press, 1966.

Clarey, J. W. Drug use and its relationship to certain activities for a sample of male students in a private high school. Dissertation Abstracts International, 1975, 35 (10-A), 6450-6451.

Deardon, M. H. and Jekel, T. F. Pilot program in high school drug education utilizing nondirective techniques and sensitivity training. Journal of School Health, 1971, 41, 118-124.

Eysenck, H. J. The dynamics of anxiety and hysteria; an experimental application of modern learning theory to psychiatry. New York: Praeger, 1957.

Eysenck, H. J. The biological basis of personality. Springfield, Ill.; Charles C. Thomas, 1967.

Eysenck, H. J. and Eysenck, S. B. G. Eysenck Personality Inventory. San Diego, Calif.; Educational and Industrial Testing Service, 1968.

Flynn, W. R. The pursuit of purity: A defensive use of drug abuse in adolescents. Adolescence, 1970, 5, 141-150.

Gorsuch, R. L. and Butler, M. C. Initial drug abuse: A review of predisposing social psychological factors. Psychological Bulletin, 1976, 83, 120-137.

Gusfield, J. The structural context of college drinking. In G. L. Maddox (ed.), The domesticated drug: Drinking among collegians. New Haven, Conn.: College and University Press, 1970.

Hamburg, B. A., Kraemer, H. C. and Jahnke, W. A hierarchy of drug use in adolescence: Behavioral and attitudinal correlates of substantial drug abuse. In S. Chess and A. Thomas (eds.), Annual Progress in Child Psychiatry and Child Development, 1976, 627-647.

Hogan, R., Mankin, D., Conway, J. and Fox, S. Personality correlates of undergraduate marijuana use. Journal of Consulting and Clinical Psychology, 1970, 35, 58-63.

Holroyd, K. and Kahn, M. Personality factors in student drug use. Journal of Consulting and Clinical Psychology, 1974, 42, 236-243.

Huba, G. J., Segal, B. and Singer, J. L. Organization of needs in male and female drug and alcohol users. Journal of Consulting and Clinical Psychology, 1977, 45, 34-44.

Jenkins, C. G. Value differences in adolescent abusers and non-drug users. Dissertation Abstracts International, 1975, 35 (11-A), 7059-7060.

Kamali, K. and Steer, R. A. Polydrug use by high school students: Involvement and correlates. International Journal of the Addictions, 1976, 11, 337-343.

Kandel, D. and Faust, R. Sequence and stages in patterns of adolescent drug use. In S. Chess and A. Thomas (eds.), Annual Progress in Child Psychiatry and Child Development, 1976, 648-671.

Kanekar, S. and Dolke, A. M. Smoking, extraversion and neuroticism. Psychological Reports, 1970, 26, 384.

Keniston, K. The uncommitted. New York: Delta, 1965.

Khavari, K. A., Mabry, E. and Humes, M. Personality correlates of hallucinogen use. Journal of Abnormal Psychology, 1977, 86, 172-178.

Lanyon, R. I. Eysenck Personality Inventory. In O. K. Buros (ed.), The Seventh Mental Measurements Yearbook. New Jersey: The Gryphon Press, 1972.

Liebert, R. S. Drug use: Symptom disease or adolescent experimentation: The task of therapy. College Health, 1967, 16, 25-29.

Schubert, D. S. Arousal seeking as a central factor in tobacco smoking among college students. International Journal of Social Psychiatry, 1965, 11, 221-225.

Skolnick, J. H. Religious affiliation and drinking behavior. Quarterly Journal of Studies on Alcohol, 1958, 19, 452-470.

Snyder, C. R. Alcohol and the Jews: A cultural study of drinking and sobriety. Glencoe, Ill.: Free Press, 1958.

Wechsler, H. Alcoholic intoxication and drug use among teenagers. Journal of Studies on Alcohol, 1976, 37, 1672-1677.

Wells, B. W. and Stacey, B. G. Social and psychological features of young drug misusers. British Journal of Addiction, 1976, 71, 243-251.

West, H. J. Adolescent drug attitudes: A seven-year study on marijuana and LSD. Dissertation Abstracts International, 1975, 35 (9-A), 5944.

Zuckerman, M., Bone, R. N., Neary, R., Mangelsdorff, D. and Brustman, B. What is the sensation-seeker? Journal of Consulting and Clinical Psychology, 1972, 39, 308-321.

Zuckerman, M., Kolin, A., Price, L. and Zoob, I. Development of a Sensation-Seeking Scale. Journal of Consulting and Clinical Psychology, 1964, 28, 477-482.

APPENDIX A

Drug Use Questionnaire

Directions: For each question, please blacken the corresponding box on your answer sheet.

1. What grade are you in? a) ninth b) twelfth

2. What sex are you? a) male b) female

3. Do you think that most of the students in your grade use drugs? a) yes b) no

4. Do you think that most of your friends use drugs? a) yes b) no

5. Have you ever used marijuana or hashish? a) yes b) no
(If the answer is no, go to question 20)

About how often have you used marijuana or hashish

6. during the past 12 months? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

7. during the past 30 days? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

8. Do you most frequently use marijuana or hashish a) alone b) with one or two friends, or in a small group c) at a party

9. Do you next most frequently use marijuana or hashish a) alone b) with one or two friends, or in a small group c) at a party

10. Do you least frequently use marijuana or hashish a) alone b) with one or two friends, or in a small group c) at a party

11. What have been the most important reasons for your using marijuana or hashish? (mark all that apply)
a) To experiment--to see what it's like.
b) To feel good, to get high, or to have fun.
c) To have a good time with my friends or to fit in with a group I like.
d) Because some people don't want me to use it.

12. (same question continued)
a) To relax, to relieve tension, or to get away from my problems or troubles, or my anger or frustration.

b) To seek deeper insights and understanding.
c) Because of boredom, nothing else to do.
d) To increase or decrase the effects of some other drugs.

13. Which of the above is the most important reason?
a) 11a b) 11b c) 11c d) 11d 14a) 12a 14b) 12b 14c) 12c 14d) 12

15. Did you start using beer, liquor or wine (not as part of religious services) before you started using marijuana or hashish? a) yes b) no

16. When you use marijuana or hashish, how high do you normally get?
a) not at all, or a little high b) moderately high c) very high

17. Have you enjoyed using marijuana or hashish
a) not at all b) somewhat c) very much

18. About what percentage of the time that you use any drugs do you use them with alcohol, so that their effects overlap?
a) 0-10% b) 10-25% c) 25-50% d) 50-75% e) more than 75%

19. About what percentage of the time that you use drugs other than alcohol do you use them so that their effects overlap?
a) 0-10% b) 10-25% c) 25-50% d) 50-75% e) more than 75%

20. Have you ever taken hallucinogens such as LSD, STP, DMT or mescaline?
a) yes b) no (If no, go to question 28).

About how often have you used hallucinogens:
21. during the past 12 months? a) not at all b) once a month or less
c) 2-3 times a month d) about once a week e) more than once a week

22. during the past 30 days? a) not at all b) once a month or less
c) 2-3 times a month d) about once a week e) more than once a week

23. Indicate the most frequent setting in which you use hallucinogens:
a) alone b) with one or two friends, or in a small group c) at a party

24. What have been the most important reasons for your using hallucinogens? (mark all that apply)
a) To experiment--to see what it's like.
b) To feel good or to have fun.
c) To have a good time with my friends, or to fit in with a group I like.
d) Because some people don't want me to use it.

25. (Same question, continued)
a) To relax or relieve tension, or to get away from my problems, troubles, anger or frustration.
b) To seek deeper insights and understanding.
c) Because of boredom, nothing else to do.
d) To increase or decrease the effects of some other drug.

Which of the above has been the most important reason?
26. a) 24a b) 24b c) 24c d) 24d 27. a) 25a b) 25b c) 25c d) 25d

28. Have you ever used beer or wine? a) yes b) no (If no, go to question 41).

About how often have you used beer or wine
29. during the past 12 months? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

30. during the past 30 days? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

31. What percent of the time did you use wine for ritual religious purposes (e. g., for communion or for kiddush, etc.)?
a) 0-10% b) 10-25% c) 25-50% d) 50-75% e) more than 75%

32. Indicate the most frequent setting in which you use beer or wine, other than when wine is used for religious purposes:
a) alone b) with one or two friends, with family, or in a small group c) at a party

33. In a typical month, how many cans of beer do you drink? (1 can = 12 0z.= 1 beer mug) a)0 b) 1-4 c) 5-9 d) 10-19 e) 20 or more

34. In a typical month, how many 4-ounce glasses of wine do you drink? (A standard drinking glass contains 8 ounces; a bottle of wine contains roughly 6 four-ounce glasses of wine) a)0 b) 1-4 c) 5-9 d) 10-19 e) 20 or more

About how often have you used liquor
35. during the past 12 months? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

36. during the past 30 days? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

37. In a typical month, how many shots of liquor do you drink? (A shot =1½ ounces of liquor, and there are about 17 shots to a fifth of liquor. A mixed drink has a little less than a shot of liquor).
a) 0 b) 1-4 c) 5-9 d) 10-19 e) 20 or more

38. Indicate the most frequent setting in which you use liquor:
a) alone b) with one or two friends, or in a small group
c) at a party

39. When you drink beer, wine or liquor, do you usually get
a) not at all high b) a little high c) moderately high d) drunk
e) pass out

40. During the past year, how often have you become drunk on beer, wine or liquor?
a) never b) once or twice c) every few months d) once or twice a month e) about once a week or more

41. Have you ever taken amphetamines (speed) without a doctor telling you to take them? a) yes b) no (If no, go to question 48).

About how often have you used amphetamines:

42. during the past 12 months? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

43. during the past 30 days? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

44. What have been your most important reasons for using amphetamines? (mark all that apply)
a) To experiment--to see what it's like.
b) To feel good, to have energy, to get high, or to have fun.
c) To have a good time with my friends, or to fit in with a group I like
d) Because some people don't want me to use them.

45. (Same question, continued)
a) To get away from my problems or troubles, or my anger or frustration.
b) To seek deeper insights and understanding.
c) Because of boredom, nothing else to do.
d) To increase or decrease the effects of some other drugs.

46. What has been the most important reason?
a) 44a b) 44b c) 44c d) 44d 47. a) 45a b) 45b c) 45c d) 45d

48. Have you ever taken quaaludes, barbiturates or tranquilizers (these include Librium, Valium, Miltown, sleeping pills, or pills to help you relax, fall asleep, or calm down) without a doctor telling you to take them? a) yes b) no (If no, go to question 55).

About how often have you used quaaludes, barbiturates or tranquilizers

49. during the past 12 months? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

50. during the past 30 days? a) not at all b) once a month or less c) 2-3 times a month d) about once a week e) more than once a week

51. What have been your most important reasons for using quaaludes, barbiturates or tranquilizers? (mark all that apply)
a) To experiment--to see what it's like.
b) To feel good or to have fun.
c) To have a good time with my friends, or to fit in with a group I like.
d) Because some people don't want me to use them.

52. (Same question, continued)
    a) To relax or relieve tension, or to get away from my troubles or problems, or my anger or frustration.
    b) To seek deeper insights or understanding.
    c) Because of boredom, nothing else to do.
    d) To increase or decrease the effects of some other drugs.

Which of the above is the most important reason?
53. a) 51a b) 51b c) 51c d) 51d 54. a) 52a b) 52b c) 52c d) 52d

55. What religion are you? a) Jewish b) Roman Catholic c) Irish Catholic d) Protestant e) Other (specify on answer sheet)
    (If you consider yourself to be an agnostic or an atheist, in which religion were you raised?)

56. If you are Jewish, do you consider yourself to be: a) Orthodox b) Conservative c) Reform or Reconstructionist d) non-practicing

57. If you are Christian, how important do you consider religion to be in your life?
    a) Very important--it's a central issue, and I'm involved at least weekly in religious activities.
    b) Somewhat important, and I'm involved at least monthly in religious activities.
    c) Not very important, and I'm not frequently involved in religious activities.
    d) It's not important.

APPROVAL SHEET

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The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

5/18/88
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