

Utah State University

DigitalCommons@USU

All Graduate Theses and Dissertations

Graduate Studies

5-1982

Inhalant Use Among Native American Adolescents: A Comparison of Users and Nonusers at Intemountain Intertribal School

John L. Wingert
Utah State University

Follow this and additional works at: <https://digitalcommons.usu.edu/etd>



Part of the [Psychology Commons](#)

Recommended Citation

Wingert, John L., "Inhalant Use Among Native American Adolescents: A Comparison of Users and Nonusers at Intemountain Intertribal School" (1982). *All Graduate Theses and Dissertations*. 1130. <https://digitalcommons.usu.edu/etd/1130>

This Dissertation is brought to you for free and open access by the Graduate Studies at DigitalCommons@USU. It has been accepted for inclusion in All Graduate Theses and Dissertations by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.



**INHALANT USE AMONG NATIVE AMERICAN
ADOLESCENTS: A COMPARISON OF USERS AND
NONUSERS AT INTERMOUNTAIN INTERTRIBAL SCHOOL**

JOHN L. WINGERT

1982

INHALANT USE AMONG NATIVE AMERICAN ADOLESCENTS:
A COMPARISON OF USERS AND NONUSERS AT
INTERMOUNTAIN INTERTRIBAL SCHOOL

by

John L. Wingert

A dissertation submitted in partial fulfillment
of the requirements for the degree

of

DOCTOR OF PHILOSOPHY

in

Psychology

Approved:

~~Major~~ Professor

~~Committee~~ Member

~~Committee~~ Member

~~Committee~~ Member

~~Committee~~ Member

~~Dean of Graduate Studies~~

UTAH STATE UNIVERSITY
Logan, Utah

1982

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to Dr. Marvin Fifield, my advisor, for his continued guidance, helpful assistance, and tireless efforts in providing opportunities for professional growth in all aspects of my doctoral program.

Next, I would like to thank the administration, teachers, staff, and students of Intermountain Intertribal School for their cooperation.

Finally, I extend my gratitude to my wife, Corinne, for her patience, encouragement, and support in fulfilling this assignment.

John L. Wingert

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	v
ABSTRACT	vi
Chapter	
I. INTRODUCTION	1
Background of the Problem	1
Statement of the Problem.	3
Objectives.	3
Research Questions.	4
Definition of Terms	5
II. REVIEW OF THE LITERATURE.	7
Purpose and Structure of the Review	7
Section One	7
Section Two	12
Section Three	21
Summary	25
III. METHODOLOGY	27
Subjects.	27
Data and Group Instrumentation.	29
Individual Instrumentation.	30
Procedures.	33
Analysis of the Data.	34
IV. RESULTS	35
Section One	35
Section Two	42
Section Three	46
V. DISCUSSION.	53
Discussion of the Findings.	53
Implications and Comments	61
Directions for Future Research.	64
REFERENCES	67

TABLE OF CONTENTS (continued)

	<u>Page</u>
APPENDICES	73
Appendix A: Informed Consent Form	74
Appendix B: Cumulative Record Data Sheet	76
Appendix C: Washington State Self-Concept Scale	78
Appendix D: Revised Social Assets Scale	84
Appendix E: Native American Rating Scale	89
Appendix F: Drug Use Questionnaire	91
VITA	93

LIST OF TABLES

Table	Page
1. Means, Standard Deviations, and Analysis of Variance Summary for the Native American Rating Scale	36
2. Means, Standard Deviations, and Analysis of Variance Summary for the Revised Social Assets Scale.	37
3. Means, Standard Deviations, and Analysis of Variance Summary for the Delay Scores of the California Achievement Test Subtests.	38
4. Means, Standard Deviations, and Analysis of Variance Summary for the 1980-81 Grade Point Average.	40
5. Means, Standard Deviations, and Analysis of Variance Summary for the Merit and Demerit Points	40
6. Means, Standard Deviations, and Analysis of Variance Summary for the Washington State Self-Concept Scale. . .	41
7. Discriminant Function Coefficients	43
8. Percentage of Subjects Correctly Classified on Discriminant Function.	44
9. Group Centroids (Mean Discriminant Score).	45
10. Group Membership by Age and Sex.	46
11. Group Membership and Lifetime Prevalence of Drug Use in Percentages	47
12. Age of Initial Inhalant Use.	48
13. Types of Inhalants Used According to Two User Groups . . .	49
14. Reasons Cited for Inhalant Use by Two User Groups.	50
15. Reported Level of Intoxication for Two User Groups	51
16. Reported Frequency of Inhalant Use Compared to Incident Reports of Inhalant Use	51

ABSTRACT

Inhalant Use Among Native American Adolescents:
A Comparison of Users and Nonusers at
Intermountain Intertribal School

by

John L. Wingert, Doctor of Philosophy
Utah State University, 1982

Major Professor: Dr. Marvin G. Fifield
Department: Psychology

The objective of this study was to investigate a population of identified inhalant users at Intermountain Intertribal School, comparing and contrasting two user groups to a control group of nonusers on a number of selected research variables. The subjects included 42 identified inhalant users. Subjects were further classified into two user groups: one-time users and repeat users, and 20 nonusers. The nonuser group comprised the control group. Each subject was individually interviewed and administered the research and data collection instruments. In addition, other essential information was taken from permanent school records.

A one-way analysis of variance was computed to ascertain the relationship between group membership and 11 selected research variables. A discriminant function analysis was computed to determine differences in the 11 research variables as well as to classify and

predict group membership. A descriptive analysis of a questionnaire was also reported.

Statistically significant differences were found among the three research groups on six of the 11 variables. The discriminant function correctly classified 72% of the subjects, and analysis of the group centroids indicated that the greatest distinctions among the groups were between the nonuser group and the repeat user group. The data present a pattern of inhalant use similar to other populations. The importance of early identification and treatment as well as preventative programs is discussed. Implications of the study and recommendations for further research were made.

(93 pages)

CHAPTER I

INTRODUCTION

Background of the Problem

The inhalation of psychotropic substances and vapors for mind altering and recreational purposes has a history dating back hundreds of years. However, although the inhalation of volatile substances is one of the oldest and simplest forms of producing an intoxicated state, it has been only in the last 20 years or so that the use of nonmedical inhalants such as glue, gasoline, and spray paint has become a matter of national health concern.

Sharp and Brehm (1977) report that there has been a lack of interest and support for efforts to define even the most basic elements, to evaluate the consequences, or to deal with the problem in a systematic way. Reasons cited for this lack of focus include what they have termed a derogatory attitude towards the majority of the population of inhalers not only on the part of the general populace, but also on the part of those from other drug cultures. Labeling inhalant use as "glue sniffing," a label suggesting something derogatory and/or demeaning, may have contributed to a limited approach to the problem, for this label ignores other forms of inhalant abuse. Furthermore, the types of products used may support another reason for limited concern about inhalant abuse. Many of the products used in inhalants have been used for several decades in the home and are generally considered safe by the average consumer. Thus, attempts by consumer and industrial protection agencies to regulate the use of

volatile substances have been more directed at "accidental" or chronic exposure rather than deliberate acute intoxication.

The problems associated with the use of inhalants as an intoxicant were almost totally unknown prior to 1959 (Susman & Kupperstein, 1968). This practice is presently being perceived by law enforcement officials, educators, and mental health professionals as a major form of drug abuse among certain subgroups of young people of grade and high school age. Concern has grown as reports by medical and drug use specialists have shown that the toxicity associated with inhalant use exceeds that of other commonly used drugs.

While Sharp and Brehm reported in 1977 that no thorough evaluation of the prevalence of inhalant abuse existed at that time, there is a considerable body of research describing the use of inhalants in the general youth population. The literature generally agrees that certain groups of American youth tend to be overrepresented among the users of inhalants. The Native American population is one such group who are consistently reported as having one of the highest levels of prevalence of use (Angle & Eade, 1975; Goldstein, Oetting, Edwards, & Garcia-Mason, 1979; Kaufman, 1973; Oetting & Goldstein, 1978).

An examination of the literature concerned with Native American inhalant use reveals that a majority of the data consists of findings from survey studies of illicit drug use in general which only addresses inhalant use as one of numerous types of substance abuse. Thus, the existing data are both sparse and largely limited to reports of prevalence of use. Studies such as Oetting and Goldstein's (1978) underscore the findings that Native American youth are two to three

times more likely to become involved in the use of inhalants than the general youth population. Goldstein et al. (1979) reported a prevalence figure for a group of Native American students enrolled in an arts and technical college of 30%. Unfortunately, other than survey type data describing prevalence, the literature contains little information which discusses relevant issues associated with inhalant abuse among the Native American population.

Statement of the Problem

An understanding of the physical environment and social variables associated and contributing to inhalant use is necessary before appropriate steps can be undertaken leading to successful identification, treatment, and prevention of inhalant abuse. Although there are data in the literature that discuss the use of inhalants among the general youth population, there is a paucity of information concerning this problem among Native Americans. Thus, it is imperative that additional information examining variables associated with or mitigating against inhalant abuse among the Native American population be assembled. Such information is essential for clinicians and others to build upon to formulate approaches which will help to solve the problem.

Objectives

The existing literature describing the use of inhalants among Native American youth has been derived primarily from surveys. Surveys tend to address prevalence data, ignoring or overlooking other imperative information. This study differed from most other studies reported in the literature in that it was a comprehensive study investigating

the population of identified inhalant users at Intermountain Intertribal School. The research compared and contrasted the user groups to a control group of nonusers on a number of selected research variables. Based on the students' scores on these research variables, an investigation was made of the power of the variables to statistically predict and classify the students according to the three criterion groups they represented. This study also focused upon identifying important descriptive factors associated with the use of inhalants at Intermountain Intertribal School.

Research Questions

To accomplish the above objectives, the following research questions were set forth.

1. Do statistically significant differences exist between non-users of inhalants, one-time users of inhalants, and repeat users of inhalants in scores that measure "traditional" Native American characteristics?

2. Do statistically significant differences exist between non-users of inhalants, one-time users of inhalants, and repeat users of inhalants in desirable physical and psychological characteristics as measured by the Revised Social Assets Scale (Luborsky, Todd, & Katcher, 1973)?

3. Do statistically significant differences exist between non-users of inhalants, one-time users of inhalants, and repeat users of inhalants in academic achievement as measured by the Reading, Mathematics, and Written Language scores of the California Achievement Test (Tiegs & Clark, 1970)?

4. Do statistically significant differences exist between non-users of inhalants, one-time users of inhalants, and repeat users of inhalants in academic grade point average obtained during the 1980-81 school year?

5. Do statistically significant differences exist between non-users of inhalants, one-time users of inhalants, and repeat users of inhalants in the cumulative total of school assigned merit and demerit points obtained during the 1980-81 school year?

6. Do statistically significant differences exist between non-users of inhalants, one-time users of inhalants, and repeat users of inhalants on measures of self-concept, self-ideal, and a discrepancy score as determined by the Washington State Self-Concept Scale (Fifield, 1963)?

7. What is the power of the research variables addressed in the above research questions to classify the subjects into the three research groups?

8. What are the characteristics of users of inhalants in regards to sex, age, drug use correlates, age of initial inhalant use, types of inhalants used, reasons for inhalant use, level of intoxication, and frequencies of use?

Definition of Terms

Drug abuse or substance abuse is the self-prescribed use of a drug or toxic substance for nonmedical purposes.

Inhalant use, also known as solvent use or "sniffing," is a form of drug abuse. Inhalant use is the deliberate inhalation of a volatile substance for the purpose of its intoxicating effects.

A volatile substance is a substance capable of emitting vapors such as glue, gasoline, paint thinner, spray paint, plastic cement, magic markers, or a variety of similar products. The National Institute on Drug Abuse defines the inhalation of such substances as use of hallucinogens (Sharp & Brehm, 1977). Inhalants thus are substances that are capable of producing illusions and bizarre distortions of time, space, sound, color, and emotion. Other drugs that are commonly inhaled such as marijuana, cocaine, and hashish are excluded from the inhalant definition because they do not possess the property of volatility, that is, the capability of being converted to a vapor.

CHAPTER II

REVIEW OF THE LITERATURE

Purpose and Structure of the Review

The literature review in this chapter is divided into three sections, sequentially related and designed to lead to an understanding of the current state of knowledge relating to inhalant use. The three sections addressed in this chapter include: (a) background information including historical data, pharmacological and toxicological findings, and current legal status of inhalant use, (b) socio-psychological data, and (c) a review of research findings concerning Native Americans and inhalant use.

Section One

Historical background. As with other types of illicit drug use, inhalant use is not without historical antecedents. Throughout history, the inhalation of a variety of vapors has been a popular method of altering consciousness. Smith (1976) writes of variants of inhalation among such groups as the ancient Greeks and Hebrews and South American Indian tribes. In the early 1800's, the first uses of the anesthetics--nitrous oxide, ether, and chloroform--were as intoxicants. Medical applications in the fields of surgery and dentistry followed. The use of anesthetics for recreational purposes continued throughout the nineteenth century in Europe and the United States and even exhibited an occasional resurgence in this century in the 1920's and 1940's (Barnes, 1979).

Among the earliest solvents used for purposes of intoxication were the petro-chemicals, primarily gasoline. One of the first articles published signaling the origin of gasoline sniffing in this country appeared in 1934 by Nunn and Martin. The first known report of glue sniffing appeared 25 years later on August 2, 1959 in the Denver Post. The earliest published reference to glue sniffing by children was made also in 1959 and concerned the arrest of a number of children in the Tucson, Arizona area (Susman & Kupperstein, 1968). Seven years later, it was reported to be occurring in every state in the United States. In fact, Brecher et al. (1972) in the highly lauded layman's guide to drug use, Licit and Illicit Drugs, postulates that popular news accounts of glue sniffing in the Southwest in the late fifties, with its detailed descriptions of what sniffing is and how it is done, resulted in popularizing and spreading the practice throughout the country. Since the early 1960's, there have been reported cases of forms of inhalant use by children and adolescents from countries throughout the world.

While inhalant abuse appeared to have its modern roots in the use of model airplane glue sniffing, eventually a long list of vaporizing fluids came to be used as intoxicants. These included various contact cements and adhesives, paints, lacquers and thinners, dry cleaning fluids and spot removers, transmission and brake fluids, liquid waxes and wax strippers, certain shoe polishes, lighter fluids, nail polish removers, degreasers, refrigerants, and other volatile products.

Not long after the aerosols became popular items on the marketplace, they were also found to be intoxicating and their use for this purpose spread (Cohen, 1973). Initially, glass chillers and

vegetable nonstick frying sprays were used, and eventually almost every type of aerosol available has been inhaled.

Pharmacology and toxicology of inhalant use. Inhalants, when breathed into the lungs, result in a quick and effective reaction in the body. In Report Series, the National Institute on Drug Abuse (1979) reported that the inhalation of volatile substances through the lungs carries the chemicals via the bloodstream directly to the brain. Thus, the effects of inhalation are felt almost immediately. The chemicals are carried by and stored in fatty substances known as lipids which are found in high concentrations in the brain and throughout the central nervous system. Prockrop and Couri (1977) state that "it is presumed that the lipid solubility of volatile substances causes central nervous system depression by impairing membrane permeability and neural transmission" (p. 186). Because volatile substances are stored by lipophilic substances until they are disposed of, a chemical buildup may occur if new chemicals are absorbed before any stored residue is expelled.

Although the toxic effects of inhaling most volatile substances are generally believed to be transient in nature, there are certain substances that present serious health hazards. According to Bass (1970), the most prominent threat to health associated with inhalant abuse is what he terms the "sudden sniffing death" syndrome which is related to sniffing the fluorocarbons contained in aerosols. Sudden sniffing death was coined by Bass to describe over 100 deaths he had researched during the 1960's and found to be related to aerosol sniffing. The sudden sniffing death syndrome is caused when the

fluorocarbons sensitize the heart to the adrenal hormone, epinephrine, which is in itself a strong stimulant. By potentiating the effect of epinephrine on the heart, wildly erratic heartbeat and increased pulse occur. The result can be heart failure and death. Barr and Jones (1978) have compiled accounts of over 300 such deaths resulting from intentional inhalation of aerosol sprays.

Duzen and Welty (1979) report that another medical concern related to the use of inhalants which was not recognized until recently is the occurrence of lead poisoning from the use of gasoline containing tetraethyl. They state that the consequences of lead poisoning may lead to a person carrying a toxic amount of lead in the body for extended periods of time without symptoms, then becoming critically ill. They report that with a prolonged low level poisoning with lead, there is usually a slow but definite damage to the brain that cannot be reversed.

There are also behavioral toxicities associated with inhalant use that affect both occasional and chronic users. These include plastic bag suffocation and accidental injuries suffered from explosives, falling from heights, automobile accidents, and other unintentional injuries.

To better understand how these behavioral injuries may come about, an explanation of the subjective effects and symptoms associated with inhalant intoxication is needed. Wyse (1973) described the development of symptoms into four stages. In the first stage, the user experiences feelings of euphoria, excitation, dizziness, visual and auditory hallucinations, coughing, nausea and vomiting, flushed skin, and bizarre

behavior. The second stage is marked by early central nervous system depression, with symptoms including confusion, disorientation, loss of self-control, headache, and pallor. In Wyse's third stage of medium central nervous system depression, further reduction of arousal and coordination occur with drowsiness, incoordination, slurred speech, depressed reflexes, and nystagmus. The fourth stage of late central nervous system depression includes unconsciousness which may be accompanied by bizarre dreams, epileptiform seizures, and possible electroencephalogram (EEG) changes. Wyse points out that the major difference between the symptoms of drunkenness due to alcohol and intoxication via inhalation of solvents seems to be the occurrence of hallucinations.

From the data presented above, it can be inferred that there is no "safe" way to use inhalants. There are dangers to both the one-time or casual user as well as the chronic habituated user.

Legal status. The National Institute on Drug Abuse (1979) reports that in the United States, 31 states have passed laws prohibiting the sniffing of volatile substances. Infraction is usually a misdemeanor punishable by a fine and/or imprisonment. There is, however, considerable variation of the penalty from state to state. Volatile substances are not covered under the Comprehensive Drug Abuse Prevention and Control Act of 1970; therefore, there are no Federal penalties involved for the possession or selling of these substances.

The labeling of hazardous products is required by the Hazardous Substances Act of 1960 by the Consumer Product Safety Commission. For example, glues containing toluene are labeled with the message, "avoid

prolonged or repeated breathing of vapors." Additional regulation of substances and banning are also possible under this Act. The Consumer Product Safety Act of 1972 can also be used to regulate and ban hazardous consumer products. As of 1979, the National Institute on Drug Abuse reported that no action against commercial products that are abused had been taken under these laws.

Section Two

Prevalence of use. Epstein and Wieland (1979) point out that there is a paucity of epidemiological data on the prevalence and morbidity associated with inhalant use. Barnes (1979) stated that the prevalence of use varies greatly from population to population and from time to time. Difficulties also arise in making comparisons because of the differences in methodologies used in many of the studies.

The Second Report of the National Commission on Marijuana and Drug Abuse (Abelson, Cohen, Schroyer, & Rappaport, 1972) stated that inhalation of glue and other vapors is "essentially a youth phenomenon," citing figures from a 1972 National Survey indicating that 11% of junior high school students, 9% of senior high school students, and 2% of college students reported inhaling solvents at least one time. Although the Commission's survey may have validity on a national level, there are indications that the incidence of inhalation use is greater than the national average in selected geographical areas, as will be discussed below. Also, despite the Commission's claim that inhalant use is a youth phenomenon, their data did not include grade school aged children, who have been demonstrated not to be protected against exposure to inhalants.

Stybel, Allen, and Jewels (1976) reported that in 1973, the Dallas Independent School District conducted a systematic survey among 8,179 students in eight grade levels. The percentage of students who reported having used inhalants at least once ranged from a low of 7.8% in the fifth grade to a high of 23.2% in the ninth grade. A nationwide survey in 1977 conducted by Johnson, Bachman, and O'Malley (1977) of 14,186 high school seniors indicated that 11% reported having used inhalants. Other studies (Abelson, Fishburne, & Cisin, 1975; Glenn, 1976; Gosset, Lewis, & Phillips, 1971) present use patterns in the 7-9% range for youths who have used inhalants, but only fractions of a percent were current or continual users.

Barnes (1979) reviewed drug usage surveys and reported that the prevalence of inhalant use can range from less than 1% to over 60% in certain populations. The highest reported prevalence was found among native populations (Angle & Eade, 1975; Lynn, 1975). Since inhalant use did not generally appear on drug use surveys until the 1970's, Barnes stated that it is difficult to determine whether use is on the increase or not.

One finding consistent across prevalence studies is the marked overrepresentation of minority groups among inhalant users. It has been frequently observed that Spanish-American groups tend to be overrepresented in the populations of sniffers (Ackerly & Gibson, 1964; Barker & Adams, 1963; Sokol & Robinson, 1973). Especially high rates of use have been reported among Native American groups (Angle & Eade, 1975; Kaufman, 1973; Oetting & Goldstein, 1978; Strimbu & Sims, 1974). For reasons not addressed in the literature, blacks tend to be

underrepresented in comparison to other racial and ethnic minorities (Langrod, 1970).

Sex differences. Most of the studies in the literature describe the population of inhalant users as overwhelmingly male (Blanchard, Libet, & Young, 1973; Corliss, 1965; Glaser & Massengale, 1962; Krug & Henry, 1974; Press & Done, 1967). However, other studies have indicated that sex differences were not significant (Fejer, 1971; Galli, 1974; Klinge, Naziri, & Lennox, 1976). Rosenberg, Kasl, and Berberian (1974) suggested that a possible reason for the nonoccurrence of sex differences is that female use of most types of drug use is on the increase when compared with the level of male drug use. It would appear also that the presence or absence of differences may be a factor of the level of changes in traditional values, allowing for the broadening of experiences that may be more available now to females.

Age factors. There is considerable evidence in the literature indicating that inhalant use is predominantly an activity of the young (Blanchard et al., 1973; Press & Done, 1967; Sterling, 1964). These studies have indicated that it is especially present during the early years of adolescence. Most of the survey data tends to show that the use of solvents decreases with age and/or grade in school (Annis, Klug, & Blackwell, 1971; Fejer, 1971; Gosset et al., 1971; Smart, Feger, & White, 1972). Smart et al. found that the use of inhalants seemed to peak at about the sixth to seventh grade level.

Fallaice and Guynn (1976) report of inhalant use by adults. This use, however, seems to occur when alcohol is not available such as among inmates at institutional settings (Chenoweth, 1977) and among health care workers who have access to anesthetics.

Socioeconomic factors. The socioeconomic status of families of inhalant users has been described as comprised of primarily unskilled workers and accompanied by a fair degree of unemployment (Glaser & Massengale, 1962; Massengale, Glaser, LeLievre, & Dodds, 1963; Strimbu & Sims, 1974). However, other researchers (Gosset et al., 1971; Press & Done, 1967) found no significant relationship between inhalant use and socioeconomic factors.

There was previous mention that the highest levels of prevalence occur among the most impoverished groups such as on Native American reservations and within families of Spanish-Americans. While most types of drug use depend to a large degree on a source of income to purchase drugs, this does not appear to be the case with inhalants. Inhalants are readily obtainable at relatively low cost, e.g., gasoline and aerosols, and Strimbu and Sims (1974) found that a low amount of spending money was positively related to the use of glue.

Family characteristics. The literature pertaining to family characteristics of inhalant users is basically descriptive in nature and focused upon the level of intactness of the family and overall judgments of the effectiveness of the family. A very prominent and consistent finding is multiple aspects of family disruption and disorganization (Barker & Adams, 1963; Brozowsky & Winkler, 1965; Chapel & Taylor, 1968; Press & Done, 1967). Disruptive family influences include divorce (Lawton & Malmquist, 1961), conception of children by other than the natural parents (Brown, 1968), and abandonment of family by one of the parents (Eason, 1962).

Press and Done (1967) reported that there tends to be a high incidence among families of inhalant users in which the father is absent from the family or in which the father's level of interaction in family matters is lacking. Massengale et al. (1963) reported that one or both parents were missing from three-quarters of the homes of the glue sniffers, and in one-half of the cases, one or both parents were alcoholic.

The literature provides little insight into the actual pathology beyond pointing to the general turmoil and ineffectiveness of family functioning. Bonnheim and Korman (1972) videotaped structured interviews among family members of inhalant users and other drug using controls. Blind ratings of the tapes by professionals reflected a significantly more conflictual, anxious atmosphere in inhalant user families with particular problems in communication and organization. It should be noted that this is a correlational finding and that it is especially important to differentiate family reactions to a family member's sniffing from antecedent family conditions that may have contributed to the member's sniffing.

School performance. Numerous authors have commented on the generally poor school performance of inhalant users (Ackerly & Gibson, 1964; Annis et al., 1971; Kandel, 1975; Smart et al., 1972). Barker and Adams (1963) reported that inhalant users tended to be two grades lower than a nonuser control group of the same age in academic achievement. Galli (1974) reported a higher incidence of absenteeism from school among sniffers. Winburn and Hayes (1974) noted that the prevalence of inhalant use among school dropouts was higher than for youths who were still attending school.

If the performance of inhalant users is in fact poorer than the performance of nonusers, it is unlikely that these differences are due to a lack of intelligence. Press and Done (1967) and Massengale et al. (1963) reported that sniffers do not appear to be substantially less intelligent than other students. It appears likely that the performance decrements of inhalant users are related to other factors such as poor motivation.

Personality characteristics. Frequent mention of personality characteristics has been made in case histories of inhalant users. Published speculation on personality factors involved in an increased likelihood that a person will use inhalants has relied primarily on information from confirmed inhalant users.

Korman (1977) pointed out that it is likely that inhalant users will frequently show personality characteristics which are the result, either directly or indirectly, of the physical or social impact of inhalant use. Under circumstances such as when inhalant users come to the attention of legal or medical personnel during a crisis, Korman warns that some of the data is suspect to an unknown degree.

In an early study of 27 glue sniffers, Massengale et al. (1963) conjectured that inhalants were helpful in controlling the anxiety that would otherwise have accompanied strong sexual and aggressive impulses. Press and Done (1967) inferred from their study of 16 inhalant users that the principal personality factors at work included a sense of inadequacy, bashfulness, and feelings of frustration over inability to reach high standards of behavior. Nurcombe, Bianchi, Money, and Cawle (1970) studied gasoline sniffers who come from traditionally

belligerent clans in a remote part of Australia. They posit a higher than average need for discharge of tension associated with sexual, aggressive, and acquisitive drives.

In the literature cited above, there is an absence of comprehensive studies based on a useful theoretical framework. Rather, the studies seem to be based upon happenstance observations of a sample's salient personality characteristics. Korman (1977) attempted to provide some structure for the study of personality by plotting into a composite profile the Minnesota Multiphasic Personality Inventory findings of individuals primarily identified as inhalant users that had been collected by two investigators (Berry, 1976; Comstock, 1976). This composite sample (mean age of 18) included mostly men (85%) and was half Anglo and half Mexican-American or American Indian. Slightly more than half of the individuals were hospitalized at the time of the testing. The personality description for the resulting profile (8-4-9) included such descriptors as (a) a predisposition to exhibit strange and not very well organized beliefs, occasionally of a delusional nature, and (b) a tendency to undercontrol impulses, to act out, to resist or derogate others, particularly personality figures. Despite the structured attempt to study personality variables in this study, the earlier stated warning by Korman (1977) applies regarding the caution with which such interpretations need to be made.

Correlates of inhalant use with other drug use. A number of studies have examined the correlations between inhalant use and other types of drug use. These studies generally report a positive relationship.

Smart et al. (1972) found that the use of glue tended to be highly correlated with the use of all licit and illicit drugs. Findings by Whitehead (1970) also supported the interrelationship among various types of drug use and inhalant use. In a sample of 902 drug users, Whitehead found that there were more users of inhalants than nonusers of inhalants in virtually every other type of drug use with the exception of tobacco.

The issue of possible progression up the "drug ladder" is a particularly important one for inhalant users. As stated previously, the use of inhalants appears to be an activity of the young, and thus inhalants are a drug of early initiation into the drug culture. Kramer (1972) reported that nearly half of a sample of 47 heroin addicts began their drug use with glue sniffing. Whitehead and Brook (1973) found that over one-third of the persons seen at drug treatment units in London, Ontario reported using inhalants. Unfortunately, so little is known about the incidence of sniffers who do stop short of becoming heavily involved with the use of other drugs that causal arguments derived from studies of drug users tend to confirm very little.

Treatment and prevention approaches. The literature contains many anecdotal accounts regarding the difficulties encountered in modifying inhalant use behavior. Comstock (1976) reported on a sample of inhalant users in contrast to groups of other drug users in regards to pre-post changes in treatment. He found that the inhalant users demonstrated significantly less favorable changes on psychometric measures following a period of hospitalization during which psychotherapy, social work, and vocational rehabilitation services were available.

Chevaili (1976) reported that inhalant users were "virtually unreachable" by traditional therapeutic methods because of lack of verbal ability and the unavailability of basic support systems usually provided by the family, school, and work institutions.

In an attempt to overcome verbal limitations, Campuzano (1976) utilized psychodrama in the treatment of inhalant users as well as the inclusion of paramedical personnel in alternating group therapy sessions. A somewhat similar attempt to the pitfall of the verbal therapies through a very active "reality therapy-confrontation" was used with limited success by Braiten (1973). Additional accounts dealing with the effectiveness of such approaches as well as the previously mentioned adjunctive methods involving the school, home, and work are reported; but many of these are largely anecdotal and do not report treatment outcome.

The role of the school in not only the treatment but also the prevention of inhalant use was the focus of a study by Silberberg and Silberberg (1974). They reported that a spurt in arrests for inhalant use sometimes follows on the heels of a school drug education program. The need to initiate programs that develop self-worth within the context of the schools was emphasized. They concluded that the typical inhalant user can succeed most easily in an alternative education program where traditional academic skills are not the only aptitudes necessary for success.

Barker and Adams (1963) reported of a number of attempts of prevention programs stressing the need to appeal to merchants to control in some fashion the sale of the more popular inhalants in a

particular community. Such efforts, complicated by the patchwork of local laws regulating the sale of various inhalants, appear not to have changed inhalant related behavior. Attempts to control inhalant use through unpleasant additives or chemical replacement have been thwarted by the sniffer's discoveries of other intoxicating substances (Cohen, 1973). It can also be argued that the number of products that would have to be altered is too large to make this approach practical.

An additional strategy for the prevention of inhalation use is drug education. Although drug education has at times been found to increase the use of drugs, this increase may be curiosity motivated and short-lived in duration (Barnes, 1979). It has been pointed out that people imagine the effects of certain drugs to be even greater or more dangerous than they actually are. Drug education could then reduce certain fears, arouse curiosity, and even produce an increase in drug use. This certainly is an area needing more systematic research.

Section Three

Inhalant use among Native Americans. The existing literature contains little basic data on the epidemiology of drug use, much less the use of inhalants, among Native American populations. A report on Native American drug use prepared by Oetting and Goldstein (1978) reports that while there is considerable information about the use of drugs in most youth populations, surveys and other illicit drug use studies have, for the most part, excluded representative samples of Native Americans. The reasons cited for this neglect or oversight include the fact that most Native American youths tend to be in separate schools, such as reservation schools, and that they often

reside in isolated areas. It has also been suggested that it is difficult to collect data on drug use from the reservations where Native Americans reside because of the difficulty in establishing trust and maintaining respondent anonymity.

A large proportion of the current data on Native American use of inhalants has come from drug use surveys that have included inhalants as one of the many types of drug use. Shortcomings of this research include the biases that are often inherent in survey research. This includes the lack of standardization of surveys that lead to problems of reliability, validity, and objectivity (Hochhauser, 1979). The "demand characteristics," that is, the cues available to a subject regarding the nature of the research, may cause the respondent of a survey to bias the responses in a particular direction, depending on the interactions with and the interpretations of the survey conditions.

One of the most comprehensive inquiries into drug use among Native American youth was a survey conducted by Oetting and Goldstein in 1978. They surveyed 1,918 7th through 12th graders from five different but culturally related tribes in the Southwest. The results were compared with a large-scale study done at Columbia University by Elinson, Josephson, Zanes, and Raboin (1973) of approximately 30,000 students in grades 7 through 12 from four different regions of the United States. Findings revealed that a significantly greater proportion of the young people in the Native American sample reported having tried alcohol, marijuana and glue, or other inhalants than students in the Columbia sample. The use of inhalants alone was higher in the Native American

sample at all grade levels. The prevalence of use among Native Americans was reported to be at close to its highest level by the 7th and 8th grades and then increased only slightly during the next couple of years before stabilizing.

Oetting and Goldstein (1978) reported that inhalant use, like the use of other drugs, was increasing steadily with age for every age group, but with every year the rate was going up. Children were stated to be starting younger, and more of them were using inhalants. It was projected of the present sample of 11-year-olds that by the time they reach 17, more than one-third of them will have tried inhalants. Oetting and Goldstein (1978) also reported that many of the Native Americans who were heavily involved with inhalants appeared to have "special problems and needs" and were described as having a low expectancy of achieving satisfactory life goals. The report, however, contained no further description or discussion of the nature of these "special problems and needs."

A survey commissioned by the Division of Health Improvement Services of the Navajo Tribe to study the patterns of substance abuse among Navajo public school students was undertaken by the American Indian Resources Organization, Inc. (Duzen & Welty, 1979). This included a survey of 8th, 9th, and 11th graders in the public schools of Tuba City, Shiprock, Fort Defiance, Chinle, and Crownpoint. Of the over 500 students in the sample, 15% of the girls and 19% of the boys admitted to ever having used inhalants. Students that did use inhalants were very apt to use alcohol and marijuana as well.

Goldstein et al. (1979) administered a drug use survey to 127 male and 149 female Native American students at an arts and technical school with a mean age of 21 years. One of the most striking findings of this study was that 30% of the sample had tried inhalants at some time in their life, while 4% had admitted to having used inhalants during the preceding two months. Goldstein et al. (1979) stated that the levels of current use were surprisingly high given the ready availability of marijuana and alcohol that was reported. This study tended to support the belief that inhalant use is a special problem for young Native Americans. The high level of current use was in conflict with the popular notion that inhalants would be used only when other more "desirable" drugs were not available.

Other than surveys, there has been little descriptive research addressing the characteristics of Native American inhalant users. Albaugh and Albaugh (1979) attempted to link inhalant abuse and alcohol abuse by administering questionnaires and interviewing 45 Cheyenne and Arapaho Native Americans in an exploration of the common determinants of inhalant use and alcoholism. The sample was divided into three groups: (a) alcoholics without a sniffing background (mean age of 38), (b) alcoholics with a sniffing background (mean age of 24), and (c) sniffers only (mean age of 13). Their findings suggested that all subjects shared common characteristics, among them an average income of approximately \$3,000, getting high was viewed as fun and acceptable to peers, unstable family compositions with a male alcoholic sporadically present, and having been arrested at least once. Common parent-child experiences related by all three groups included an admired male figure

who was in and out of the home and did not usually handle discipline, while the mother figure in the house was characterized as kind but also a poor disciplinarian. Albaugh and Albaugh (1979) hypothesized that the findings suggest that confusing family interpersonal relationships, alcoholism in the family, severe parent-child emotional deprivation, and certain unspecified cultural ideals predispose to alcoholism. Chronic sniffing was felt by the researchers to be pre-alcoholic behavior.

The Albaugh and Albaugh (1979) study was important research which supported what other writers suspected regarding some of the dynamics that may predispose to inhalant use. However, a number of weaknesses in design are evident. While these flaws include a wide age range discrepancy between the groups, lack of a nonsubstance abusing control group, and unsubstantiated causality, mention is made of user characteristics of a Native American sample which is absent from other survey research.

Summary

This chapter has provided a selective review of the available literature concerning inhalant use. The literature is not extensive nor is the research style well designed. As such, there are many unanswered questions not addressed from the admittedly incomplete data available.

The historical background, toxicology, and pharmacology have been discussed as well as the legal status. Characteristics of inhalant users have been reviewed, and a sketchy and sometimes contradictory

profile of the inhalant user has emerged. Reports on the prevalence of inhalant use varies with wide ranging estimates in its use among different populations. The discrepancy between national survey figures and special populations at higher than average risk for inhalant use was discussed. Studies reviewing the relationship between inhalant use with other types of drug use as well as overviews of approaches to treatment and preventive measures were presented. Finally, the use of inhalants among Native American populations was reviewed. Findings from these studies, generally survey in nature, suggest that the use of inhalants may very well be a significant problem for Native American youth. Systematic studies of inhalant use among Native American populations are lacking.

CHAPTER III

METHODOLOGY

Subjects

The population of subjects for this study consisted of all students enrolled at the Intermountain Intertribal School in Brigham City, Utah during the 1980-81 school year. Intermountain Intertribal School (hereafter referred to as Intermountain) is the largest off-reservation boarding school for Native Americans, operated by the United States Government, Bureau of Indian Affairs. Enrollment at Intermountain is open to any Native American between 14 to 20 years of age who has one-fourth or more Native American blood and who is an enrolled member of a recognized tribe. During the 1980-81 school year, almost 100 different Native American tribes were represented among Intermountain's 800 students.

Despite the variety of tribal representation, Intermountain's students are not typical of that of the general Native American population. Intermountain students tend to have a number of special needs and characteristics. For example, nearly three-fourths of the students who come to Intermountain have, for various reasons, dropped out of public schools ("Students Return," 1979). More than two-thirds of Intermountain students come from disrupted homes where one or both of the natural parents are absent, and one-half of Intermountain students come from families with incomes that are less than one-half of the Federal poverty guideline.

Three subgroups were selected from the total accessible population.

1. Nonuser control group. This group of nonusers was identified from a larger sample of approximately 40 students randomly selected from a student enrollment list. The nonuser group consisted of 20 students who did not have a record of inhalant use at Intermountain during the 1980-81 school year. To insure that these students were indeed nonusers and not users who had not been caught, staff members of the school dormitory program verified from observation and personal opinion that students selected for this group had a low likelihood of involvement in inhalant use during the present school year. Self-report information was also used. The first 20 students to meet the above criteria comprised the nonuser control group.

2. One-time users. This group of inhalant users consisted of students who, during the 1980-81 school year, received one incident report for use of inhalants and who were in enrollment during the second semester. Twenty-one students were included in this group. By the use of the label "one-time user," the researcher is not attempting to imply that the subjects in this group have only used inhalants once. Rather, it is a means of labeling the subject according to what is contained in the school records. Thus, in the eyes of school personnel relying on incident reports, the subjects in this group have received only one incident report for the use of inhalants.

3. Repeat users. This group consisted of students who, during the 1980-81 school year, received two or more incident reports for the use of inhalants and who were in enrollment during the second semester of the school year. Twenty-one students were included in this group.

All of the students in the sample were volunteer participants in the study (see Appendix A). There were no refusals from any student who was invited to partake in the project.

Data and Group Instrumentation

Certain school information and standardized test results were taken directly from students' cumulative records. A data sheet was prepared to facilitate recording information directly from the cumulative records (see Appendix B). Information listed on the cumulative record data sheet included the following.

1. California Achievement Test scores. A measurement of academic achievement was obtained from the Reading, Mathematics, and Written Language scores of the California Achievement Test (CAT) (Tiegs & Clark, 1970). The scores from this test were selected for two reasons. First, it was part of the regular testing program at Intermountain. All students were administered the CAT in October by school personnel as part of the standardized testing program. Second, it has a very positive review by Buros' Eighth Mental Measurements Yearbook (1978). The critical reviews in Buros described the CAT as "a model of professionally accepted methodology of test development designed for measuring, evaluating, and analyzing school achievement" (p. 341). Scores were transferred from permanent school records to the cumulative record data sheet.

2. Academic grade point. The academic grade point earned by each student in the sample during the 1980-81 school year was transferred from permanent school records to the cumulative record data sheet.

3. Merit and demerit points. Intermountain has developed and utilized a Code of Student Rights and Responsibilities, which serves as

the rules of conduct for the students. Noncompliance to the Code results in the assessment of demerit points. Demerit points are assessed for a wide variety of violations of the Code such as truancy, consumption of alcohol and other intoxicants such as inhalants, and abusive or aggressive behavior. Merit points may be earned for exemplary behavior such as consistent school attendance and volunteer work. A cumulative listing of all merit and demerit points for each student in the sample during the 1980-81 school year was transferred to the cumulative record data sheet.

A student who is apprehended and cited for inhalant use is assessed a specific number of demerit points. As the students were assigned to the three research groups on the basis of the number of citations, the comparison of demerit points presented a potential bias. To adjust for this, the demerit totals did not include the demerit points received for inhalant use for the two user groups.

Individual Instrumentation

The following instruments were administered individually to each student in the sample.

1. Washington State Self-Concept Scale. The Washington State Self-Concept Scale was used as a measure of the student's self-concept. This instrument was developed by Fifield (1963) and is based upon Charles Osgoods' concept of verbal opposites in semantic space. The scale contains two subtests: (a) A self-appraisal subtest, described by Fifield as "designed to quantify the individual's thoughts and feelings about himself as he sees and rates them" (p. 80). (b) A self-ideal subtest, described as "designed to quantify the individual's

thoughts and feelings about himself as he would ideally like them to be" (p. 83). A discrepancy score is derived by summing the numerical differences between the self-appraisal subtest and the self-ideal subtest. This score represents the distance between the appraised-self and the ideal-self. Fifield reports that the lower the discrepancy score, the more healthy and strong is the self-concept. Split-half coefficients for the scale obtained from administration to junior and senior high school students are: self-appraised score .834, self-ideal score .926, and discrepancy score .865. A copy of the Washington State Self-Concept Scale is located in Appendix C.

2. Revised Social Assets Scale. The Revised Social Assets Scale was developed by Luborsky et al. (1973) to assist in the prediction of physical and psychological illness or vulnerability. This scale purports to measure socially desirable physical and psychological assets, the possession of which suggests that the person in the past had been able to perform successfully and should be able to bear life's current stresses.

The reported reliability obtained from an analysis (Luborsky et al., 1973) of the odd and even split-halves was .70. The validity of the scale was obtained from predictive validity coefficients with studies involving improvement during brief psychiatric hospitalizations and with reported physical and psychological illnesses from samples of patients with documented physical illnesses (Jacobs, 1972). The student version (see Appendix D) of this instrument was administered to each student in the sample.

3. Native American Rating Scale. A rating scale designed to assess the extent to which the subject's background experiences and life style parallel those areas that are thought to reflect what are considered "traditional" Native American modes of life was developed for this study following the Research and Development model (Borg & Gall, 1979). The initial form of the scale was developed through research and information collecting. This included a review of the literature to identify factors reflective of similarities of life among Native Americans. The instrument was then reviewed by Intermountain staff members and others who had exposure to and are knowledgeable of the various aspects of Native American life style. The reviewers included both Anglo and Native Americans. Product revision was then based upon the criticisms, comments, and suggestions of the reviewers. The revised scale was then again reviewed by the advisers and changes were made accordingly. Preliminary field testing was done on the Navajo Reservation among boarding school students, and the final scale revision was done. Criteria for the final product were based upon agreement and consensus by the advisory group. The scale was administered to each student in the sample in a questionnaire format with one item (blood level) taken from permanent school records (see Appendix E).

4. Drug Use Questionnaire. This questionnaire was taken in part from a questionnaire used by a series of studies attempting to gain in-depth knowledge about Native American drug use (Oetting & Goldstein, 1978). Additional items were included to obtain more specific data on the use of inhalants. This instrument was reviewed and revised in the

same manner as the Native American Rating Scale above and was field tested at an Indian boarding school other than Intermountain. Each subject completed the questionnaire which included self-report information on prevalence of various types of drug use and specific questions pertaining to inhalant use (see Appendix F).

Procedures

Interest in the exploration of the topic of inhalant abuse among students at Intermountain was first expressed by Intermountain officials. Following several discussions between the writer and school personnel, a proposal was prepared outlining the objectives, methodology, and expected outcomes for such a study. The proposal was initially submitted to the Utah State University Research Bureau and to the Utah State University Human Subjects Committee for review and approval. Following approval by these committees, the proposal was submitted to the Intermountain School administration for review. Approval was obtained by the Intermountain administration to use the school as the site for the study.

Potential subjects were identified through review of Intermountain school records. Each subject was individually interviewed after permission for participation was obtained. Each subject was also individually administered the measuring instruments. The interviews and administration of instruments took place during regular school hours in March and April, 1981. To insure confidentiality, each subject was assigned a code number and names were deleted from all data. Needed information from the school permanent records was transferred to the data sheet in June, 1981. A review was made of the

citations of students receiving incident reports for use of inhalants, and final assignment to the three research groups was made. The statistical analysis was undertaken in July, 1981, and the final report was then prepared.

Analysis of the Data

Since the data collected contained different types of measurement with different levels of precision, the analysis procedures were selected to fit the data.

1. The relationship between the three levels of group membership and (a) "traditional" Native American characteristics, (b) desirable physical and psychological assets, (c) academic achievement, (d) grade point average, (e) school assigned merit and demerit points, and (f) self-appraisal, self-ideal, and discrepancy were analyzed using a one-way analysis of variance. Tukey post hoc comparisons were computed as necessary to make all the possible combinations of group mean differences. An alpha level equal to .05 was used for decision making.

2. To determine potential differences in the above listed variables among the three levels of group membership, a discriminant function analysis was utilized to statistically classify the subjects into the three research groups. The three research groups were used as criterion groups, and the research variables were the discriminating variables that were weighted and combined using Wilks' Lambda to optimally discriminate among the groups.

3. Data obtained on the drug use questionnaire was reported in descriptive form only. Thus, the analysis of this information was reported in percentages and/or frequencies.

CHAPTER IV

RESULTS

The purpose of this study was to investigate the relationship between selected variables and three levels of inhalant involvement among Native American students enrolled in Intermountain Intertribal School. The results are addressed in the following three sections.

Section One of this chapter addresses Research Questions 1 through 6, determining the relationship between the three levels of inhalant use involvement (nonuser control group, one-time user, and repeat user) and (a) "traditional" Native American characteristics, (b) desirable physical and psychological assets, (c) academic achievement, (d) grade point average, (e) school assigned merit and demerit points, and (f) self-appraisal, self-ideal, and discrepancy.

Section Two addresses the power of the variables described above to classify the subjects, based on the scores of the variables, into the three research groups. This is addressed by Research Question 7.

Section Three addresses Research Question 8, describing the findings obtained by the drug use questionnaire relating to descriptive factors associated with the use of inhalants at Intermountain.

Section One

Native American characteristics. Research Question 1 examined the probability of statistically significant differences among the three research groups on a measure of "traditional" Native American characteristics as measured by the Native American Rating Scale. A one-way

analysis of variance revealed no statistically significant differences among the group means at the .05 level of significance.

Table 1
Means, Standard Deviations, and Analysis of Variance
Summary for the Native American Rating Scale

	<u>Nonusers</u>		<u>One-time users</u>		<u>Repeat users</u>		<u>F</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
Total score	7.45	2.11	8.05	1.53	7.85	1.62	.61	.55

In this study, a measure of the characteristics considered to be traditional to Native Americans was not found to differentiate between nonusers, one-time users, and repeat users of inhalants at Intermountain School.

Desirable psychological and physical assets. Research Question 2 examined the probability of statistically significant differences existing among the three research groups on a measure of desirable psychological and physical assets as measured by the Revised Social Assets Scale. A one-way analysis of variance revealed that statistically significant differences did exist among group means. A Tukey post hoc comparison was computed to make all the possible combinations of the differences between the means.

Table 2
Means, Standard Deviations, and Analysis of Variance
Summary for the Revised Social Assets Scale

	<u>Nonusers</u>		<u>One-time users</u>		<u>Repeat users</u>		<u>F</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
Total score	-2.3	8.8	-9.7	11.7	-14.4	10.5	7.00	.001 ^a

^aThe nonuser group and the repeat user group differed significantly at the .001 level.

Results indicated that the nonuser group scored statistically significantly higher on the Social Assets Scale than did the repeat user group at the .05 level. The one-time user group did not differ statistically significantly from either of the two other research groups. Thus, according to Luborsky et al. (1973), the nonuser group as a whole possesses more socially desirable physical and psychological assets than does the repeat user group, and should be better "equipped" and able to more successfully withstand life's stresses. This finding is consistent with the premise of the scale in that the sum of a person's social assets would be an important factor in predicting the psychological vulnerability to behaviors such as the use of inhalants.

Academic achievement. Research Question 3 examined the probability of statistically significant differences existing among the three research groups in academic achievement as measured by the Reading,

Mathematics, and Written Language scores of the California Achievement Test. A one-way analysis of variance was computed for each of the three scores, and Tukey post hoc comparisons were computed.

Table 3 indicates no significant differences between any of the three group means on the Reading scores. This finding is contrary to expectations. The literature supports the contention that inhalant users have generally poorer school performance than nonusers, and reading ability is highly correlated with overall school performance.

Table 3

Means, Standard Deviations, and Analysis of Variance
Summary for the Delay Scores of the California
Achievement Test Subtests

	<u>Nonusers</u>		<u>One-time users</u>		<u>Repeat users</u>		<u>F</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
Reading	3.4	1.9	4.5	2.0	4.6	1.5	2.50	.09
Mathematics	2.6	1.6	3.7	1.9	4.1	1.4	4.56	.01 ^a
Written Language	3.2	2.4	3.7	2.3	5.0	1.4	4.17	.02 ^b

^aThe nonuser group and the repeat user group differed significantly at the .01 level.

^bThe nonuser group and the repeat user group differed significantly at the .05 level.

Significant differences were, however, evident between the nonuser group and the repeat user group on the Mathematics score. These scores (Table 3) are reported in terms of years and months of delay as measured from the current grade level of the student. Thus, the higher group mean for the repeat user group indicates that the nonuser group is less delayed and conversely, higher achieving in mathematics. The one-time user group did not differ significantly from either of the two other groups. A similar pattern was found on the comparisons of the Written Language scores. The nonusers were the highest achievers and differed significantly from the repeat users. The findings regarding the Mathematics and Written Language scores were consistent with reports in the literature that inhalant users tend to have generally poorer school performance than nonusers (Ackerly & Gibson, 1964; Annis et al., 1971; Galli, 1974; Kandel, 1975; Smart et al., 1972).

Grade point average. Research Question 4 examined the probability of significant differences existing among the three research groups on academic grade point obtained during the 1980-81 school year. A one-way analysis of variance revealed that significant differences did exist among group means at the .01 level (Table 4).

The Tukey post hoc comparison revealed that the nonuser group's grade point average was significantly higher than the one-time user and the repeat user groups' grade point average.

Merit and demerit points. Research Question 5 examined the probability of significant differences existing among the three research groups on the cumulative total of school assigned merit and demerit points. A one-way analysis of variance revealed no significant

Table 4
Means, Standard Deviations, and Analysis of Variance
Summary for the 1980-81 Grade Point Average

	<u>Nonusers</u>		<u>One-time users</u>		<u>Repeat users</u>		<u>F</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
Grade point	2.55	.61	1.86	.56	1.94	.58	8.42	.006 ^a

^aThe nonuser group differed significantly from both the one-time user group and the repeat user group at the .01 level.

Table 5
Means, Standard Deviations, and Analysis of Variance
Summary for the Merit and Demerit Points

	<u>Nonusers</u>		<u>One-time users</u>		<u>Repeat users</u>		<u>F</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
Merit points	79.3	41.5	73.9	61.0	49.7	53.6	1.85	.17
Demerit points	56.8	94.7	82.6	67.0	100.6	89.1	1.39	.25

differences among group means on the totals of either merit or demerit points.

Washington State Self-Concept Scale. Research Question 6 examined the probability of significant differences existing among the three research groups on self-appraisal, self-ideal, and discrepancy scores

as measured by the Washington State Self-Concept Scale. A one-way analysis of variance was computed for each of the three scores, and Tukey post hoc comparisons were computed.

Table 6
Means, Standard Deviations, and Analysis of Variance
Summary for the Washington State Self-Concept Scale

	<u>Nonusers</u>		<u>One-time users</u>		<u>Repeat users</u>		<u>F</u>	<u>p</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
Self-appraisal	224.9	168.7	169.6	176.4	178.9	162.0	7.65	.001 ^a
Self-ideal	263.0	189.7	221.6	209.7	224.8	188.9	2.71	.07
Discrepancy	38.1	27.1	51.0	33.8	45.9	39.7	5.51	.04 ^b

^aThe nonuser group differed significantly from both the one-time user group and the repeat user group at the .001 level.

^bThe nonuser group differed significantly from the one-time user group at the .05 level.

The self-appraisal score for the nonuser group was found to be significantly greater than the scores for both the one-time and repeat user groups. This suggests that the nonuser group appraises their thoughts and feelings about themselves more positively than do the two other groups.

There were no significant differences among any of the group scores on the self-ideal subtest. These data suggest that members of all three groups ideally see themselves as similar.

There were, however, significant differences between the nonuser and one-time user groups on the discrepancy score. This suggests that the self-concept of the nonuser is healthier and stronger than the one-time user's self-concept. This finding is consistent with the reports in the literature discussing personality characteristics of inhalant users (Press & Done, 1967). The repeat user group's discrepancy score did not differ significantly from either of the two other groups.

Section Two

Classification. Research Question 7 examines the power of each of the variables under investigation to classify the subjects into the three research groups: nonusers, one-time users, and repeat users. A discriminant function analysis was computed for this purpose. It is the purpose of a discriminant function analysis to identify known criterion groups which are thought to differ on a series of predictor variables. In this study, the criterion groups were represented by the three research groups, and the classification variables were represented by the variables being investigated.

A stepwise procedure was used for this classification. This procedure involves the use of a linear combination of discriminating variables being added into the analysis one at a time. Nie, Hull, Jenkins, Steinbrenner, and Brent (1975) point out that the use of a stepwise procedure results in an optimal set of variables being selected. This procedure produces a measure which indicates the probability of membership of a subject to the respective group. Each

case is assigned to the group with the highest probability of group membership.

A variable pattern with seven variables was found to most adequately differentially classify the membership of the three research groups. This variable pattern included the following research

Table 7
Discriminant Function Coefficients

Predictor variable	Standardized discriminant function coefficient
Grade point average	.62
Merit points	.30
Self-appraisal score (WSSCS)	2.89
Self-ideal score (WSSCS)	-3.50
Reading score (CAT)	-.21
Written Language score (CAT)	-.33
Social Assets score (RSAS)	.54

Note. Eigenvalue = .74; relative percentage of variance = 72%; canonical correlation = .65; Wilks' Lambda = .78; $df(6)$; $p = .02$.

variables: (a) grade point average, (b) Revised Social Assets Scale score, (c) Reading score, (d) Written Language score, (e) self-appraisal score, (f) self-ideal score, and (g) merit points. The addition of other research variables at this point had the effect of lessening the power of the discriminant function.

Table 8 presents the percentage and number of subjects correctly classified by the selected variables on the discriminant function. For the nonuser group, 16 (80%) of the 20 subjects were correctly classified on the basis of their scores on the seven discriminating variables. Four (20%) were incorrectly classified, 2 (10%) were classified in the one-time user group, and 2 (10%) were classified in the repeat user group.

Table 8
Percentage of Subjects Correctly Classified
on Discriminant Function

Actual group	<u>n</u>	Predicted group membership					
		Nonusers		One-time users		Repeat users	
		<u>n</u>	%	<u>n</u>	%	<u>n</u>	%
Nonusers	20	<u>16</u>	<u>80.0</u>	2	10.0	2	10.0
One-time users	21	2	9.5	<u>15</u>	<u>71.5</u>	4	19.0
Repeat users	21	5	23.8	2	9.5	<u>14</u>	<u>66.7</u>

Note. Percentage of subjects correctly classified overall: 72.58%.

Fifteen subjects (71.5%) were correctly classified from the one-time user group, with 2 subjects (9.5%) incorrectly classified in the nonuser group and 4 subjects (19%) incorrectly classified in the repeat user group. The repeat user group had the lowest correct

classification rate. Fourteen out of the 21 subjects (66.7%) were classified as repeat users, while 5 subjects (23.8%) were classified in the nonuser group and 2 subjects (9.5%) in the one-time user group. These data indicate that using the variables listed above can lead to the correct classification of subjects into the groups for 72.85% of the cases.

The data in Table 9 indicate the primary distinctions between the groups (nonusers, one-time users, repeat users) using the group centroid as a means of comparison. The centroid is the most typical location of a single case from its group in the discriminant function space (Nie et al., 1975).

Table 9
Group Centroids (Mean Discriminant Score)

Group	Group centroid
Nonusers	1.19
One-time users	-.36
Repeat users	-.78

The greatest distinctions between groups as indicated by the group centroids are between the nonuser group (group centroid equals 1.19) and the repeat user group (group centroid equals -.78). The one-time user group centroid (-.36) falls in between these two extremes.

Section Three

This final section examines Research Question 8. Findings from the Drug Use Questionnaire describing characteristics of inhalant users and the relationship of inhalant use to other types of substance use at Intermountain are presented.

Group membership broken down by age and sex. Table 10 presents the mean age in years and the sex of the sample according to group membership. While the mean ages differ only slightly among the groups (about 8 months), there is a tendency for increased age to be associated with a lower level of inhalant use.

Table 10
Group Membership by Age and Sex

Group	Mean age (in years)	Females	Males
Nonusers	17.0	11	9
One-time users	16.6	6	15
Repeat users	16.3	3	18

The sex differences of the groups suggest a general trend for males to be overrepresented in the inhalant using groups. This supports literature contentions describing the population of inhalant users as overwhelmingly male (Blanchard et al., 1973; Corliss, 1965).

Group membership and lifetime prevalence of drug use. The lifetime prevalence of illicit drug use by group membership is

presented in Table 11. All three of the research groups are similar in their reported prevalence of usage of various intoxicating agents, although figures do not reflect the frequency of incidence of usage.

Table 11
Group Membership and Lifetime Prevalence
of Drug Use in Percentages

Drug	Nonusers	One-time users	Repeat users
	%	%	%
Alcohol	100	86	100
Marijuana	95	95	86
Stimulants	25	14	29
Depressants	20	29	29
LSD	10	14	22
Cocaine	25	29	29
Peyote	25	14	29
Inhalants	0	95	91

There is little variation in the prevalence figures across groups for most of the substances listed, with the notable exception of inhalants. None of the nonuser group indicated that they had ever used inhalants in the past. The slight variation across groups is contrary to findings by Whitehead (1970) who reported that there were more users of inhalants than nonusers in virtually every other type of drug use in

his study. The overall prevalence for the groups is, however, quite similar to those found by Oetting, Edwards, Goldstein, and Garcia-Mason (1980) in their study of drug use among adolescents of five Native American tribes.

Age of initial inhalant use. Table 12 lists the age at which members of the two inhalant user groups indicated they first used an inhalant. The range for both groups is from 8 years to 17 years with the mean age for both groups at the 13th year.

Table 12
Age of Initial Inhalant Use

Age (years)	One-time users	Repeat users
	<u>N</u>	<u>N</u>
8	2	1
9	-	-
10	-	2
11	-	-
12	1	4
13	5	3
14	2	3
15	6	2
16	1	1
17	2	2
No response	2	3
Mean age	13.7	13.2

While the mean age for the initial use of inhalants is during the 13th year for both groups, the mean age of these groups as reported in

Table 10 is 16 years. This suggests that the average inhalant user has been using inhalants for about three years, indicating that many of the users had used inhalants prior to enrollment in Intermountain.

Types of inhalants used. Three volatile substances were listed by the two user groups as the type of substance they usually use. Spray paint is the most popular of the three substances listed with only a few subjects in either group acknowledging use of gasoline or glue.

Table 13

Types of Inhalants Used According to Two User Groups

Inhalant	One-time users	Repeat users
	%	%
Spray paint	90	79
Cement glue/glue	9	19
Gasoline	5	9

Note. Total exceeds 100% as some respondents listed more than one inhalant.

The use of spray paint as the most popular inhaled substance is in agreement with Cohen (1973) who reported on the widespread use of aerosols as intoxicants. The dangers associated with the use of glue, gasoline, and spray paint have been well documented (Barr & Jones, 1978; Duzen & Welty, 1979).

Reasons cited for inhalant use. The responses given to the questionnaire item intended to assess reasons for inhalant use are

listed in Table 14. The most popular response was "because friends do," while none of the respondents listed "to escape from frustration." The one-time users appear to vary only slightly from the repeat users, although they responded to "curiosity" much more frequently than did the repeat users.

Table 14
Reasons Cited for Inhalant Use by Two User Groups

Item	One-time users	Repeat users
	%	%
Because friends do	52	49
Frustration	26	35
Curiosity	31	14
To get high	19	14

Note. Total exceeds 100% as some respondents listed more than one item.

Reported level of intoxication. Table 15 lists the reported level of intoxication that users obtain when using inhalants. There is a tendency for the one-time user group to report a lower level of intoxication than the repeat user group.

Self-report of inhalant use vs. recorded use. The number of times members of the two user groups reported having used an inhalant during the school year is listed in Table 16. Seven of the one-time users report a higher level of use than are documented in school records, and 10 of the repeat users report likewise.

Table 15
Reported Level of Intoxication for Two User Groups

Level of intoxication	One-time users %	Repeat users %
Just enough to get high	90	74
Until stagger or drop things	10	26
Until pass out or close to it	-	-

Table 16
Reported Frequency of Inhalant Use Compared
to Incident Reports of Inhalant Use

F	One-time users		Repeat users	
	Self-report	School records	Self-report	School records
0	1	0	2	0
1	13	21	1	0
2-3	5	0	7	17
4-9	1	0	5	4
10+	1	0	6	0

These data were collected to establish a validity check on the responses given by the subjects to the researcher. This table indicates the level of inhalant use the respondents were willing to

report as well as comment on the amount of inhalant use that is not detected and/or reported by school officials. The data obtained from the subjects were collected approximately one month prior to the end of the school year, while the school records were reviewed and updated after the school year had ended. Thus, as the school records may have been more current, these figures may be slightly erred on the conservative side as to the reported number of times of use. This finding is further complicated in that the subjects were asked to report the number of times they had used inhalants during the school year, but did not specifically ask how many of these times were at the school vs. at home during vacation or other times away from the school.

CHAPTER V

DISCUSSION

The purpose of this chapter is to discuss the conclusions, implications, and directions for future research generated by this study.

Discussion of the Findings

The review of literature summarized the current status of the use of inhalants for purposes of intoxication. While the literature indicated that there were conflicting findings in a number of areas and a paucity of data in other areas (such as the use of inhalants among Native Americans), a general trend profiling the use of inhalants emerged. The current study has borne out and expanded some of the findings that the literature reported and has revealed areas where the relationships are not so clearly delimited and other areas where findings were inconclusive. This section will discuss the major findings as presented in the Results chapter and draw comparisons and contrasts to the literature.

The statistical analysis indicated that there were no significant differences between the three research groups in regards to Native American characteristics. It is important to note that the literature contains a limited description of ethnic or cultural characteristics of inhalant users other than documenting the overrepresentation among minority groups such as the Spanish-Americans (Ackerly & Gibson, 1964; Barker & Adams, 1963; Sokol & Robinson, 1973) and among Native

Americans (Angle & Eade, 1975; Oetting & Goldstein, 1978). While the current study found no significant differences based upon the research construct of "traditional" characteristics, there were findings indicating different levels of incidence of inhalant abuse among different tribes represented at Intermountain.

A confounding variable may be inherent in the construct of "traditional" characteristics. Despite the common ethnic label of "Native Americans," there appear to be vast differences between tribes that were not adequately sampled by the present research construct. This was an attempt to broadly define and label particular characteristics of diverse peoples representing a multitude of recognized tribes. The findings in this study, however, suggest that there is a need for further exploration of the differences in levels of inhalant usage among various tribes. This factor will be commented upon further in the section discussing indications for further research.

The significant differences found in this study between the nonuser group and the repeat user group on the Revised Social Assets Scale were in general agreement with other studies in the literature. The Revised Social Assets Scale contains items addressing psychological and physical assets in its pool of sampled areas. The data indicate that nonusers had significantly greater social assets, suggesting that they possess more of what is valued by society in psychological and physical realms and should be better able to adapt and cope with life's challenges and misfortunes. These data are consistent with Strimbu and Sims' (1974) finding that inhalant users tend to come from the most impoverished groups and with the characterization of Barker and Adams

(1963) that families of inhalant users tend to be more disrupted and disorganized than those of nonusers. It is of interest to note that the one-time user group did not differ significantly from either of the two other research groups. The scores of the one-time user group ranged in between the nonusers' and the repeat users' scores. This middle position for the one-time users is a finding that was repeated on a number of the research variables.

Findings which compared academic functioning and levels of inhalant use are consistent with the literature, with the exception of the lack of significant differences on Reading scores. The nonusers in this study had significantly higher grade point averages than both the one-time users and the repeat users. Furthermore, they were significantly less delayed on the Mathematics and Written Language scores than the repeat users. Based upon the above differences among the groups, it is unclear why the Reading scores did not also reflect group differences. The finding of significant differences among the groups on grade point average should be interpreted as not only a logical conclusion based upon the differences in the academic achievement areas, but also may be more broadly representing factors other than academic skills alone. Elements such as motivation, conformity, classroom behavior, and possibly even the relationship to the person awarding the grade, need to be considered.

The lack of significant differences among groups on the cumulative totals of both merit and demerit points was unexpected. As group assignment was made in part on the basis of nonadherence to school regulations (reports of inhalant use), it was expected that the

differences would be more obvious. The data (see Table 5) did suggest a tendency for the nonusers of inhalants to have more merit points and fewer demerit points than the inhalant user groups.

An analysis of the Washington State Self-Concept Scale scores indicated that as the level of known inhalant abuse increased across the groups, there was a tendency for the subjects to report a lower self-appraisal. Students in the nonuser group consequently reported the most positive view of themselves. There were, however, no significant differences among the research groups in their perception of their self-ideal. This finding suggests that while all three groups tend to view themselves differently, they do express common goals in terms of what they consider to be an ideal self. The finding on the discrepancy score (the difference between the self-ideal score and the self-appraisal score) is somewhat inconsistent. The nonuser reported less discrepancy between the self-ideal and self-appraisal than did students in the one-time user group as was expected. However, the repeat users reported a lower discrepancy score than did the one-time users, although the differences were not statistically significant. Fifield (1963) reported that the lower the discrepancy, the stronger and more positive is the self-concept. Other studies report that inhalant users tend to have a less positive self-concept (Oetting & Goldstein, 1979; Press & Done, 1967). Why repeat users did not report poor self-concepts in relation to those obtained by the one-time users is uncertain.

The stepwise discriminant function analysis produced a variable pattern to classify the individual subjects into the group to which

they had the highest probability of membership based on their scores on the seven selected research variables. The pattern of variables that optimally classified group membership accounted for 72% of the variance, that is, the combined variables were able to correctly classify students based on their scores in 72% of the cases. The range extended from correct classification of 80% of the nonusers to 66.7% of the repeat users. The usefulness of a 72% classification rate for Intermountain purposes of screening and prediction is questionable due to the 28% overall error rate. However, the data do indicate the importance of certain variables as being highly associated with the use and nonuse of inhalants.

A comparison of the three groups on the centroid scores indicates that the greatest distinctions among the groups are between the nonuser group and the repeat user group, the one-time user group's centroid score falling in between these two extremes. This is similar to the pattern found on the comparisons among the groups on the research variables (Revised Social Assets Scale, CAT Reading score, CAT Written Language score, CAT Mathematics score, merit points and demerit points). The data suggest that as the number of reports of inhalant use increases, there is a tendency for the inhalant user to evidence greater disparity from the nonuser on the variables listed above.

The results from the Drug Use Questionnaire were reported in frequencies and percentages and were descriptive in nature. The collected responses of the three research groups point out several interesting facts. While the age differences among the groups were minimal, there was a tendency for the nonusers to be slightly older

than the users. This finding is consistent with the literature (Annis et al., 1971; Fejer, 1971; Gosset et al., 1971; Smart et al., 1972). In interpreting this finding, one must consider that the age range of students at Intermountain (14-20 years) constricts the possible degree of difference. The tendency for more males to be found with the user groups also is in general agreement with other researchers' findings (Blanchard et al., 1973; Corliss, 1965; Krug & Henry, 1974; Glaser & Massengale, 1962).

The reported prevalence of drug use other than inhalants was quite similar across all three groups. Alcohol and marijuana are substances that almost all students reported having tried at least once. Fewer than 30% of the students across the groups reported having used any of the other substances listed. This included stimulants, depressants, LSD, and peyote. As previously reported, the minimal variation in prevalence of substance use across the groups is contrary to findings by Whitehead (1970), but overall levels of prevalence were quite similar to those found by Oetting et al. (1980) in their study of drug use of five Native American tribes. While there is little differentiation among the groups on the basis of the prevalence data, the findings do indicate that the students in the sample have been exposed to a wide range of illicit substances, but only a distinct subgroup has engaged in inhalant use. This is further substantiated by the finding that none of the nonusers reported ever having used inhalants in the past.

The age of first-time use of inhalants as reported suggests that a number of users have used inhalants for a period of years. While the mean age for initial use is slightly over 13 years old, the mean age of

the users of inhalants is just over 16 years. These data suggest a use pattern which, although it may not be of high frequency, has a lengthy history. The data also indicate that almost one-half of the students had used an inhalant prior to age 14 and thus had experience with inhalants before entering Intermountain. As many students enter Intermountain older than the minimum age, the actual figure for students who have used inhalants prior to enrollment is likely much higher than 50%.

The three inhalants (gasoline, glue, and spray paint) that were listed by the users all have grave health risks associated with their use. Bass (1970) reported that the most prominent threat to health associated with inhalant abuse is "sudden sniffing death" syndrome related to the inhalation of the hydrocarbons contained in aerosols. The inhalation of the hydrocarbons sensitizes the heart to epinephrine resulting in wildly erratic heartbeat and increased pulse rate which may lead to heart failure and potentially death. The inhalation of gasoline vapors has recently been linked to lead poisoning, with Duzen and Welty (1979) stating that definite irreversible damage to the brain may result. In addition, glue has its hazards such as possible suffocation if the user were to pass out while inhaling the fumes contained in a plastic bag. Thus, on the basis of medical and behavioral toxicology alone, a single inhalant use incident cannot be treated lightly and should be handled with utmost concern.

The responses given to the questionnaire item examining the reasons the students indicated for using inhalants revealed that "because friends do" was listed most frequently. There were only

validity check on the responses given to the researcher. These data also serve in assessing the incidence of inhalant use not actually confirmed by the school personnel. Only 1 one-time user and 2 repeat users denied that they had used inhalants during the school year, which is in disagreement with school incidence reports. This suggests that the majority of the users responded to the research question in an open and honest manner. The data also indicate that there is a fair amount of inhalant use that is undetected or unreported by Intermountain staff. The reported levels of use by what school incidence reports would consider the "one-time users" reveals that about one-third of this group admits to a higher frequency of use. Particularly alarming is the finding that there is a group of users (7 out of 42 users) who report they have used inhalants 10 or more times in the course of the school year.

Implications and Comments

The data collected and reported in this study, although not definitive, does present a pattern consistent with findings reported by other studies in the literature. The literature findings discussed in the preceding sections indicate that inhalant use is a behavior learned when the user is quite young, frequently in the early adolescent years or even in pre-adolescence. The population of inhalant users at Intermountain consists of both those who have a prior history of inhalant use before attending Intermountain and those who have only recently begun to use inhalants. This finding suggests the need for efforts to be directed not only at treatment programs for long-time users but also preventative approaches to reduce the future incidence level.

This study has shown that aerosols are the inhalant of choice. These inhalants pose severe medical hazards even to the casual user; thus, the student who appears to be only manifesting curiosity or mimicking behaviors of the regular user presents a significant risk.

In view of the fact that the management of psychic and somatic disabilities is complicated and rehabilitation is reportedly difficult to predict, it is in preventative measures that the greatest hope in making a real impact on the problem exists. Future strategies designed upon early primary preventative efforts such as in grade school curricula would appear to be the most promising direction. As this study has indicated, it is very difficult to predict with a high degree of accuracy users from nonusers.

Certain characteristics and needs of inhalant users were identified in this study. Taking into account these findings as well as suggestions from other researchers, the following directions are offered for the development of treatment strategies.

Improvement in peer and inter-tribal relations--emphasis should be placed not so much on the unique and apparent differences between students and their respective tribes, but on the shared cultural heritage of Native Americans. This could be impacted on a schoolwide level and not necessarily limited to inhalant users. Selection of dormitory and academic scheduling may be modified for known inhalant users to introduce them to more positive peer models.

Improvement in the student's self-concept may also be considered with the above scheduling modifications. There is some indication that inhalant users tend to view the future less positively than nonusers

and, as this study has determined, tend to achieve at a lower rate on traditional academic measures. Consideration should be given for increased assessment of the inhalant user's areas of vocational talent and interest with broader use of nontraditional academic options. This would correspond to attempts designed to increase academic interest and functional ability as well as encourage improved ability to overcome moods of helplessness.

The reinforcement of appropriate behavior and the concurrent development of suitable alternative leisure and recreational activities need to be incorporated into the treatment approaches. This may come in part from involvement in already existing school programs such as counseling services, dormitory activities, sports, and other extracurricular programs. It may be necessary in some cases for special highly supervised and monitored dormitory living arrangements to be developed. Use should be made of involvement in individual and/or group counseling services to further explore needs in areas of individual psychological adjustments and adolescent developmental issues.

A final suggestion is for the treatment program to involve not only the above described multifaceted approach available at the school level, but also actively involve the student's family and, possibly, tribal representatives.

Sharp and Brehm (1977) point out that prevention of inhalation abuse is interpreted in a number of ways, but even the most simplistic goal of total prevention is seldom achieved. Preventive strategies in the school setting can include the teaching of principles of general pharmacology, highlighting potential risks and dangers of the commonly

abused substances, and offering alternative strategies to cope with frustration, apathy, and boredom such as counseling and expanded extracurricular activities.

An additional finding was that the inhalant-using population represented only 12 out of the almost 100 Native American tribes at Intermountain. One tribe, the Papago, accounted for 15% of the non-users but almost 50% of the inhalant-using groups. Two other Southwestern tribes, the Navajo and the White Mountain Apache, had the next highest rates of inhalant user representation. This finding, however, must be interpreted with caution. For example, the Papagos are the most populous tribe represented at Intermountain, accounting for almost 20% of the total school enrollment. The Navajos and White Mountain Apaches likewise are among the most populous tribes at Intermountain. Therefore, it is not surprising that these tribes account for the largest tribal proportions of inhalant users. However, from the figures available, they do appear to be overrepresented among the inhalant-using groups. Whether or not this disparity in representation is due to reasons such as selection factors or other unknown variables is unclear; however, it is an issue of importance warranting further investigation.

Directions for Future Research

While the focus of this study has been upon the relationship of selected variables to the levels of use of inhalants among Native American adolescents, the directions for future research are considerably broader than the topic of inhalant use. These directions

for research extend to the further development of instruments and variables themselves.

This study suggests that the Revised Social Assets Scale has promise as a viable means of exploring what has been termed by Luborsky et al. (1973) as a person's physical and psychological assets. This instrument could be utilized to examine unsuccessful adaptation in response to important developmental tasks of adolescence. This has been commented upon in the literature as a factor in a person's decision to choose to use illicit substances. A factor analysis of the Revised Social Assets Scale to determine whether the scale could be reduced to a smaller number of items and a further exploration of the inclusion of both objective and subjective items in a single measure should be undertaken. Improvements in the scale by the expansion of successful groups of items and reduction of the importance of others is suggested.

The concept of "traditional" characteristics of Native Americans deserves further study. The literature has not adequately addressed this topic, and what little research is available has largely labeled this area of ethnic identification under the rubric of "blood level." For example, the diversity of Native Americans as a whole may warrant a comparison of neighboring but historically distinct tribes. This may also provide information relating to the findings of varying levels of prevalence among tribes.

The discussion in the previous section outlined approaches and suggestions for preventive and treatment programs to reduce the incidence of inhalant abuse. More research is necessary in areas such

as effects of drug use information on drug use patterns, effects of fear appeals, and effects of laws and public policies such as restrictions on the sale or use of inhalants. Further exploration of the data, such as the findings describing the overrepresentation of certain tribes among the inhalant-using population, is strongly encouraged.

REFERENCES

- Abelson, H. I., Cohen, S., Schroyer, J., & Rappaport, T. Public experience with psychoactive substances. International Journal of the Addictions, 1972, 11(5), 756-759.
- Abelson, H. I., Fishburne, P. M., & Cisin, I. National survey on drug abuse. Washington, D.C.: U.S. Government Printing Office, 1975.
- Ackerly, W. C., & Gibson, G. Lighter fluid "sniffing." American Journal of Psychiatry, 1964, 120(11), 1056-1061.
- Albaugh, B., & Albaugh, A. Alcoholism and substance sniffing among the Cheyenne and Arapaho Indians of Oklahoma. International Journal of the Addictions, 1979, 14(7), 1001-1007.
- Angle, M. R., & Eade, N. R. Gasoline sniffing and tetraethyl lead poisoning in a northern native community (Report No. ERD-74-19). Canada: Epidemiological and Social Research Division Bureau, Non-medical Use of Drugs, Directorate, Health and Welfare, March 1975.
- Annis, H. M., Klug, T. R., & Blackwell, D. Drug use among high school students. Unpublished manuscript, Addiction Research Foundation, Toronto, 1971.
- Barker, G., & Adams, W. T. Glue sniffers. Sociology Social Research, 1963, 47(3), 298-310.
- Barnes, G. E. Solvent abuse: A review. The International Journal of the Addictions, 1979, 14(1), 1-26.
- Barr, W. D., & Jones, J. A. Hazard analysis of injuries relating to aerosol and pressurized containers. Washington, D.C.: U.S. Consumer Product Safety Commission, 1978.
- Bass, M. Sudden sniffing death. Journal of the American Medical Association, 1970, 212(12), 2075-2079.
- Berry, R. T. Abuse of inhalants. The International Journal of the Addictions, 1976, 10(12), 109-115.
- Blanchard, E., Libet, J., & Young, L. Apneic aversion and covert desensitization in the treatment of a hydrocarbon inhalation addiction. Journal of Behavior Therapy, 1973, 4(4), 383-387.

- Bonnheim, A., & Korman, M. Understanding glue sniffing. Canadian Journal of Public Health, 1972, 63(3), 272-276.
- Borg, W. R., & Gall, M. D. Educational research. New York: Longman, 1979.
- Braiten, T. J. Effects of exposure to solvents. Clinical Toxicology, 1973, 6(1), 109-124.
- Brecher, E. M., & the Editors of Consumer Reports. Licit and illicit drugs. Mount Vernon, N.Y.: Consumers Union, 1972.
- Brown, N. W. Gasoline inhalation. Journal of the Medical Association of Georgia, 1968, 57, 217-221.
- Brozowsky, M., & Winkler, E. G. Glue sniffing in children and adolescents. New York State Journal of Medicine, 1965, 65(15), 1984-1988.
- Buros, O. K. Eighth mental measurements yearbook. Highland Park, N.J.: Gryphon Press, 1978.
- Campuzano, A. R. Aerosol addiction for "kicks." Modern Medicine, 1976, 67(6), 378-380.
- Chapel, J. L., & Taylor, D. W. Solvent use and abuse. The International Journal of the Addictions, 1968, 52(8), 220-224.
- Chenoweth, M. B. Abuse of inhalation anesthetics. Journal of Toxicology, 1977, 23(7), 398-402.
- Chevaili, R. W. Is the inhalant addiction incurable? Paper presented at the First International Symposium on the Voluntary Inhalation of Industrial Solvents, Mexico City, June 1976.
- Cohen, S. The volatile solvents. Public Health Review, 1973, 185-214.
- Comstock, J. A review of psychological measures relevant to central nervous system toxicity, with specific reference to solvent inhalation. Clinical Toxicology, 1976, 11(3), 317-324.
- Corliss, L. M. Glue sniffing and heroin use. Journal of School Health, 1965, 35, 442-449.
- Duzen, R., & Welty, J. Gasoline and solvent sniffing. Unpublished manuscript, Public Health Service Indian Hospital, Tuba City, Arizona, 1979.

- Eason, W. M. Gasoline addiction in children. Pediatrics, 1962, 29, 250-254.
- Elinson, W., Josephson, S., Zanes, T., & Raboin, J. Portrait of a glue sniffer. Crime and Delinquency, 1973, 11(4), 394-399.
- Epstein, M. H., & Wieland, W. F. Prevalence survey of inhalant abuse. The International Journal of the Addictions, 1979, 13(2), 271-284.
- Fallaice, T., & Guynn, R. Abuse of organic solvents. Psychosomatics, 1976, 17(4), 188-189.
- Fejer, T. Drug use among high school students in North Bay, Ontario. Addiction Research Foundation, 1971, 22-47.
- Fifield, M. The self-concept as an identifying factor of school dropouts. Unpublished doctoral dissertation, Washington State University, 1963.
- Galli, N. Patterns of student drug use. Journal of Drug Education, 1974, 2(4), 377-388.
- Glaser, H. H., & Massengale, O. N. Glue sniffing in children. Journal of the American Medical Association, 1962, 181, 300-303.
- Glenn, U. O. Recent surveys of non-medical drug use. National Institute on Drug Abuse, Contract HSM-42-72-169, March 1976.
- Goldstein, G. S., Oetting, E.R., Edwards, R., & Garcia-Mason, V. Drug use among Native American young adults. The International Journal of the Addictions, 1979, 14(6), 855-860.
- Gosset, J. T., Lewis, J. M., & Phillips, V. A. Extent and prevalence of illicit drug use as reported by 56,745 students. Journal of the American Medical Association, 1971, 216, 1464-1470.
- Hochhauser, M. Bias in drug abuse survey research. The International Journal of the Addictions, 1979, 14(5), 675-687.
- Jacobs, M. A. Prediction of improvement in coping pathology in hospitalized psychiatric patients. Journal of Consulting and Clinical Psychology, 1972, 17, 409-414.
- Johnson, L. D., Bachman, J. G., & O'Malley, P. M. Drug use among American high school students, 1975-1977. Washington, D.C.: U.S. Government Printing Office, 1977.
- Kandel, D. Reaching the hard to reach: Illicit drug use among high school absentees. Addictive Disorders, 1975, 1(4), 465-480.

- Kaufman, A. Gasoline sniffing among children in a Pueblo Indian village. Pediatrics, 1973, 51, 1060-1064.
- Klinge, V., Naziri, H., & Lennox, K. Comparison of psychiatric inpatient male and female adolescent drug users. The International Journal of the Addictions, 1976, 11(2), 309-323.
- Korman, M. Clinical evaluation of psychological factors. In C. W. Sharp & M. L. Brehm (Eds.), Review of the inhalants: Euphoria to dysfunction (NIDA Research Monograph No. 15). Washington, D.C.: Government Printing Office, 1977.
- Kramer, J. D. The adolescent addict: The progression of youth through the drug culture. Clinical Pediatrics, 1972, 11(7), 382-385.
- Krug, S. F., & Henry, T. J. Personality, motivation and adolescent drug use patterns. Journal of Counseling Psychology, 1974, 21(5), 440-445.
- Langrod, J. Secondary drug use among heroin addicts. International Journal of the Addictions, 1970, 5(4), 611-635.
- Lawton, J. J., & Malmquist, C. P. Gasoline addiction in children. Psychiatry Quarterly, 1961, 35, 555-561.
- Luborsky, L., Todd, T. C., & Katcher, A. H. A self-administered social assets scale for predicting physical and psychological illness and health. Journal of Psychosomatic Research, 1973, 17(2), 109-120.
- Lynn, H. Gasoline sniffing among Indian children. Paper presented at the Inaugural Symposium of Community Health, University of Toronto, October 1975.
- Massengale, O. N., Glaser, H. H., LeLievre, R. E., & Dodds, J. B. Physical and psychological factors in glue sniffing. New England Journal of Medicine, 1963, 269, 1340-1344.
- National Institute on Drug Abuse. Report series (NIDA Monograph No. 21, U.S. Public Health Service Publication No. 2621). Washington, D.C.: U.S. Government Printing Office, 1979.
- Nie, N., Hull, C., Jenkins, J., Steinbrenner, K., & Brent, D. SPSS--Statistical package for the social sciences (2nd ed.). San Francisco: McGraw Hill Book Company, 1975.
- Nunn, J. A., & Martin, F. M. Gasoline and kerosene poisoning in children. Journal of the American Medical Association, 1934, 13, 700-702.
- Nurcombe, B., Bianchi, G., Money, J., & Cawle, J. A hunger for stimuli: The psychosocial background of petrol inhalation. British Journal of Medical Psychology, 1970, 43(4), 367-374.

- Oetting, E. R., Edwards, R., Goldstein, G. S., & Garcia-Mason, V. Drug use among adolescents of five southwestern Native American tribes. The International Journal of the Addictions, 1980, 15(3), 449-455.
- Oetting, E. R., & Goldstein, G. Native American drug use (Final Report, NIDA Grant #2R01 DA01054). Fort Collins: Colorado State University, 1978.
- Oetting, E. R., & Goldstein, G. S. Drug use among Native American adolescents. In G. Beschner & A. Friedman (Eds.), Youth drug abuse. Lexington, Mass.: Lexington Books, 1979.
- Press, E., & Done, A. K. Solvent sniffing: Physiologic effects and community control measures for intoxication from the intentional inhalation of organic solvents. Pediatrics, 1967, 39, 611-622.
- Prockrop, L., & Couri, D. Nervous system damage from mixed organic solvents. In C. W. Sharp & M. L. Brehm (Eds.), Review of the inhalants: Euphoria to dysfunction (National Institute of Drug Abuse Monograph No. 15). Washington, D.C.: Government Printing Office, 1977.
- Rosenberg, J. S., Kasl, S. V., & Berberian, R. M. Sex differences in adolescent drug use: Recent trends. Addictive Disorders, 1974, 1(1), 73-96.
- Sharp, C. W., & Brehm, M. L. Review of inhalants: Euphoria to dysfunction (National Institute of Drug Abuse Monograph No. 15). Washington, D.C.: Government Printing Office, 1977.
- Silberberg, N., & Silberberg, M. Glue sniffing in children: A position paper. Journal of Drug Education, 1974, 4(3), 301-308.
- Smart, R. G., Feger, D., & White, J. Drug use trends among metropolitan Toronto students. Unpublished manuscript, Addiction Research Foundation, Toronto, 1972.
- Smith, H. Inhalation of volatile substances. Pharmchem Newsletter, 1976, 5(2), 1-2.
- Sokol, J., & Robinson, J. L. Glue sniffing. Western Medicine, 1973, 4, 192-193.
- Some blues are dangerous. Denver Post, August 2, 1959, p. 24.
- Sterling, J. S. A comparative examination of two models of intoxication. Journal of Criminal Law, 1964, 55(1), 94-99.
- Strimbu, J. L., & Sims, O. S. A university system drug profile. The International Journal of the Addictions, 1974, 9(4), 569-583.

- Students return to Intermountain School. Box Elder Journal, August 23, 1979, p. 7.
- Stybel, L. J., Allen, P., & Jewels, F. Deliberate hydrocarbon inhalation in low socioeconomic adolescents not necessarily apprehended by the police. The International Journal of the Addictions, 1976, 11(2), 345-361.
- Susman, R. W., & Kupperstein, L. R. Bibliography on the inhalation of glue fumes and other toxic vapors. The International Journal of the Addictions, 1968, 3, 177-197.
- Tiegs, E. W., & Clark, W. W. Examiners manual for the California Achievement Test. Monterey, Ca.: CTB/McGraw-Hill, 1970.
- Whitehead, P. C. The incidence of drug use among Halifax adolescents. British Journal of Addictions, 1970, 65, 159-165.
- Whitehead, P. C., & Brook, R. Social and drug using backgrounds of drug users seeking help: Some implications for treatment. The International Journal of the Addictions, 1973, 8(1), 75-85.
- Winburn, G. N., & Hayes, J. R. Dropouts: A study of drug use. Journal of Drug Education, 1974, 4(2), 249-259.
- Wyse, G. Deliberate inhalation of volatile hydrocarbons. Canadian Medical Association Journal, 1973, 108, 71-74.

APPENDICES

Appendix A
Informed Consent Form

INFORMED CONSENT FORM

I agree to participate in a research project studying drug usage at Intermountain Intertribal School.

I understand that this will involve a short interview, questionnaires, and scales. All information will be kept confidential with neither Intermountain School personnel nor any other persons other than the primary researcher having access.

I understand that I retain the right to not respond to any or all questions and may withdraw from the study at anytime. Inquiries will be answered by the researcher.

Signature

Date

Researcher

Date

Appendix B

Cumulative Record Data Sheet

Cumulative Record Data Sheet

Research number	_____
Birth Date	_____
Sex	_____
Grade	_____
Tribe	_____
Blood level	_____
CAT scores:	
Reading	_____
Written Language	_____
Mathematics	_____
Total merit points	_____
Total demerit points	_____
Grade point average	_____
Fall semester	_____
Spring semester	_____
Average GPA	_____

Appendix C

Washington State Self-Concept Scale

Instructions for Administering the Self-Ideal Scale

EXAMINER: After the rating scales have been distributed, say:

Now please look at the front page of the self-concept scale. You will notice that the front page consists of the directions and examples of the work you are asked to do. Read the directions to yourself as I read them aloud.

On the scales below, place a cross mark (X) at the position on each scale where you would like to be. This mark represents your ideal, it represents the way you would like to see and feel about yourself. In other words, it is your ideal self.

Your choice should be a description of the way you would most like to be; therefore, indicate your first impressions or feelings about each word. Now look at the examples.

If it were possible, I would like to be slightly tall; therefore, in the first example, I have marked the blank under Slightly on the tall side of the scale.

In the next example, my ideal is to be quite attractive; therefore, I marked the blank under Quite on the attractive side of the scale.

In the third example, my ideal is to be very friendly, so I checked the blank marked Very on the friendly side of the scale.

In the last example, I would like to be quite bold; therefore, I marked the blank under Quite on the bold side of the scale.

This is not a test; therefore, there are no right or wrong answers. Make each item a separate decision--don't check them all the same. Be sure you put your check mark in the middle of the space and do not skip any.

EXAMINER: You may repeat the directions if necessary. (There is no time limit for this test.) When the directions and examples have been explained, say:

Turn to the back page. Notice that each pair of words describe some part of your ideal self. Remember to make your choice on the basis of how you would like to be. You may begin.

SELF-CONCEPT SCALE

Name	Age	Grade	School
------	-----	-------	--------

Directions:

On the scales below, place a cross mark (X) at the position on each scale where you would like to be. This mark represents your ideal, it represents the way you would like to see and feel about yourself. In other words, it is your ideal-self.

Your choice should be a description of the way you would most like to be; therefore, indicate your first impressions or feelings about each word.

Examples:

If it were possible, I would like to be slightly tall; therefore, in the first example I have marked the blank under Slightly on the tall side of the scale.

In the next example, my ideal is to be quite attractive; therefore, I marked the blank under Quite on the attractive side of the scale.

In the third example, my ideal is to be very friendly, so I checked the blank marked Very on the friendly side of the scale.

In the last example, I would like to be quite bold, therefore, I marked the blank under Quite on the bold side of the scale.

	<u>Very</u>	<u>Quite</u>	<u>Slightly</u>	<u>Neutral</u>	<u>Slightly</u>	<u>Quite</u>	<u>Very</u>	
short	—	—	—	—	<u>X</u>	—	—	tall
attractive	—	<u>X</u>	—	—	—	—	—	ugly
unfriendly	—	—	—	—	—	—	<u>X</u>	friendly
timid	—	—	—	—	—	<u>X</u>	—	bold

This is not a test; therefore, there are no right or wrong answers. Make each item a separate decision--don't check them all the same. Be sure you put your check mark in the middle of the space and do not skip over.

You may turn the page and begin.

Instructions for Administering the Self-Appraisal Scale

EXAMINER: After the rating scales have been distributed, say:

Now please look at the front page of the self-appraisal scale. You will notice that the front page consists of the directions and examples of the work you are asked to do. Read the directions to yourself as I read them aloud.

On the scales below, place a cross mark (X) at the position that you think you stand on each scale. The cross mark represents how you think of yourself. It is your self-picture. It is how you feel and think about yourself. In other words, it is your self-concept.

Your choice should be a description of your own personal likes and feelings; therefore, indicate your first impressions or feelings about each word. Now look at the examples.

I think of myself as being quite happy; therefore, in the first example, I have marked the blank under Quite on the happy side of the scale.

In the next example, I think of myself as being very much loved; therefore, I have marked the blank under Very on the loved side of the scale.

In the third example, I think of myself as being quite tall, so I checked the blank marked Quite on the tall side of the scale.

In the last example, I think of myself as being slightly timid; therefore, I marked the blank marked Slightly on the timid side of the scale.

This is not a test; therefore, there are no right or wrong answers. Make each item a separate decision--don't check them all the same. Be sure you put your cross mark in the middle of the space and do not skip any.

EXAMINER: You may repeat the directions if necessary. (There is no time limit for this test.) When the directions and examples have been explained, say:

Turn to the back page. Notice that each pair of words describe something about yourself. Remember to make your choice on the basis of how you see yourself.

SELF-CONCEPT SCALE

Name	Age	Grade	School
------	-----	-------	--------

Directions:

On the scales below, place a cross mark (X) at the position on each scale where you would like to be. This mark represents your ideal, it represents the way you would like to see and feel about yourself. In other words, it is your self-concept.

Your choice should be a description of the way you would most like to be; therefore, indicate your first impressions or feelings about each word.

Examples:

If it were possible, I would like to be slightly tall; therefore, in the first example I have marked the blank under Slightly on the tall side of the scale.

In the next example, my ideal is to be quite attractive; therefore, I marked the blank under Quite on the attractive side of the scale.

In the third example, my ideal is to be very friendly, so I checked the blank marked Very on the friendly side of the scale.

In the last example, I would like to be quite bold, therefore, I marked the blank under Quite on the bold side of the scale.

	<u>Very</u>	<u>Quite</u>	<u>Slightly</u>	<u>Neutral</u>	<u>Slightly</u>	<u>Quite</u>	<u>Very</u>	
short	___	___	___	___	X	___	___	tall
attractive	___	X	___	___	___	___	___	ugly
unfriendly	___	___	___	___	___	___	X	friendly
timid	___	___	___	___	___	X	___	bold

This is not a test; therefore, there are no right or wrong answers. Make each item a separate decision--don't check them all the same. Be sure you put your check mark in the middle of the space and do not skip over.

You may turn the page and begin.

Y Q S N S Q V		Y Q S N S Q V	
confident	_____	unconfident	_____
unskillful	_____	skillful	_____
popular	_____	unpopular	_____
free	_____	responsible	_____
sympathetic	_____	unsympathetic	_____
changing	_____	stable	_____
funny	_____	silly	_____
boring	_____	amusing	_____
independent	_____	dependent	_____
disloyal	_____	loyal	_____
sharing	_____	stingy	_____
selfish	_____	generous	_____
thoughtful	_____	inconsiderate	_____
discouraged	_____	encouraged	_____
unimportant	_____	important	_____
righteous	_____	sinful	_____
inferior	_____	superior	_____
comfortable	_____	miserable	_____
adventurous	_____	timid	_____
antisocial	_____	social	_____
active	_____	passive	_____
unhealthy	_____	healthy	_____
eager	_____	indifferent	_____
repulsive	_____	charming	_____
talented	_____	awkward	_____
unfamous	_____	famous	_____
affectionate	_____	cold	_____
false	_____	genuine	_____
right	_____	wrong	_____
worried	_____	calm	_____
unable	_____	able	_____
successful	_____	unsuccessful	_____
unhelpful	_____	helpful	_____
leader	_____	follower	_____
sloppy	_____	neat	_____
admirable	_____	disliked	_____
unnoticed	_____	noticed	_____
free	_____	captive	_____
critical	_____	praising	_____
friendly	_____	hostile	_____
lonely	_____	companionable	_____
happy	_____	unhappy	_____
hated	_____	loved	_____
hindered	_____	helped	_____
uncritical	_____	critical	_____
guilty	_____	innocent	_____
good	_____	bad	_____
cruel	_____	kind	_____
alike	_____	different	_____
mean	_____	nice	_____
agreeable	_____	disagreeable	_____
unpleasant	_____	pleasant	_____
secure	_____	insecure	_____
gloomy	_____	cheerful	_____
satisfied	_____	dissatisfied	_____
rude	_____	nice	_____
bold	_____	timid	_____
impolite	_____	polite	_____
reliable	_____	unreliable	_____
trivial	_____	prominent	_____

Appendix D

Revised Social Assets Scale

Revised Social Assets Scale
(Student Form)

1. Parent's occupation

2.0	professional- executive	0.0	retired
1.0	proprietor-small business	0.0	housewife
0.5	white collar worker	-1.0	unskilled laborer
0.5	student	-2.0	unemployed
0.0	blue collar worker		

_____ father's score

_____ mother's score

2. Present marital status

0.0	married, never divorced, separated, or widowed
-1.0	married, previous divorce, separation or death of spouse
-1.0	divorced, separated, or widowed
0.0	never married

3. Parental education

2.0	graduate degree	-1.0	some high school
1.5	some graduate school	-1.5	finished grade school
1.0	college graduate	-2.5	some grade school
0.5	some college	-3.0	no grade school
0.0	high school graduate		

_____ father's score

_____ mother's score

4. Student's school record

1.5	excellent	-1.0	barely passed
1.0	good	-2.0	frequent failure
0.0	fair		

_____ score

5. Times moved within the last year

0.0	have not moved	-2.0	five times
0.0	one time	-2.0	six times
-0.5	two times	-2.5	seven times
-1.5	three times	-2.5	eight times
-2.0	four times	-2.5	nine times

_____ score

6. Parents

Mother	Father
0.0 living	0.0
0.0 died when student over 20 years old	0.0
-1.0 died when student 16-20 years old	-1.0
-1.5 died when student 10-15 years old	-1.0
-2.0 died when student 6-9 years old	-2.0
-2.5 died when student below 6 years old	-2.5

_____ father score
 _____ mother score

7. Parent's marital status

0.5 parents are living together
-0.5 separated when student was over 20 years old
-1.0 separated when student was 16-20 years old
-1.0 separated when student was 10-15 years old
-2.0 separated when student was 6-9 years old
-2.0 separated when student was below 6 years old

_____ score

8. Health in early childhood

1.0 good
0.0 fair
-1.0 poor

_____ score

9. When you were growing up did your parents have trouble finding money for necessities?

-2.0 often
-1.0 sometimes
0.0 rarely

_____ score

10. When you were growing up did your mother have to work outside the home to earn money?

-1.0 yes
0.0 no

_____ score

11. Did your father or mother ever have the following illnesses?

-1.0 for each illness circled
arthritis, asthma, bladder trouble, colitis, diabetes, hay fever, heart condition, high blood pressure, nervous breakdown, epilepsy, stomach trouble, skin condition.

_____ score

12. When you were growing up, were either of your parents in poor health?

-2.0	all of the time	0.0	rarely
-1.0	frequently	0.0	never

_____score

13. When you were growing up, did your parents quarrel?

-2.0	all of the time	0.0	rarely
-1.0	frequently	0.0	never

_____score

14. Thinking back to the time when you were growing up, did you ever feel that :

-1.0	father spends too little time with you
-1.0	mother wants to run her children's lives
-1.0	mother does not understand you
1.0	your parents were always proud of their children

_____score

15. Father's employment

1.0	employed continuously at the same position for the last 2 years.
1.0	employed continuously during the past 2 years, but the place of employment was changed.
0.0	Out of work for the last 2 years (sometimes)
0.0	unemployed in the past 2 years.

_____score

16. Student's place of birth

0.0	a large city	0.0	small town
0.0	small city	-1.0	a farm or rural area

_____score

17. Friends

0.5	Many close friends	0.5	few close friends
0.5	some close friends	-2.0	no friends

_____score

18. Parents home ownership

1.0	own their own home	0.0	rent their home
-----	--------------------	-----	-----------------

_____score

19. Family automobile

- 0.0 there is an automobile available for family use
- 1.0 there is no automobile available

_____score

20. Family television

- 0.0 there is a television at home
- 1.0 there is no television at home

_____score

21. Physical condition

- 1.5 physical health is usually very good
- 1.0 physical health is usually good
- 0.0 occasionally ill
- 1.0 frequently ill
- 2.0 chronically ill

_____score

22. Cigaret smoking

- 0.0 do not smoke
- 0.5 smoke 5-10 cigarettes per day
- 0.5 smoke 11-20 cigarettes per day
- 2.0 smoke a pack a day
- 2.0 smoke 20-30 cigarettes per day
- 2.5 smoked 2 packs or more in the past 2 days

_____score

23. Were you disabled by illness or accident :

- 0.0 for periods of less than one week
- 0.5 for periods of less than one month
- 1.5 for as long as six weeks
- 2.5 continuously

_____score

24. If unmarried, are you:

- 1.0 engaged
- 1.0 going steady
- 0.5 dating several frequently
- 1.0 dating several infrequently
- 1.5 no dating

Appendix E

Native American Rating Scale

NATIVE AMERICAN RATING SCALE

Blood Level

- 3.0 100-76%
- 2.0 75-26%
- 0.0 25%-less

Family Residence (student's home address)

- 2.0 BIA reservation
- 1.0 Bordertown (adjacent to BIA reservation)
- 0.0 Neither of above

Initial School Experience

- 2.0 BIA boarding school
- 1.0 BIA reservation school (non-boarding school)
- 0.0 Public school (off reservation)

Parental Language

- 2.0 Tribal language only
- 1.0 Combination of tribal and English
- 0.0 English only

Student's Language

- 1.0 Combination of tribal and English
- 0.0 English only

Family Religion

- 1.0 Tribal-traditional
- 0.0 Other

Parental Education

- 2.5 None
- 2.0 Some grade school
- 1.5 Completed grade school
- 1.0 Some high school
- 0.5 Completed high school
- 0.0 College or technical education beyond high school

Participation in Tribal Activities (past 12 months)

- 1.0 Pow-wow, dancing, etc.

Total _____

Appendix F
Drug Use Questionnaire

DRUG USE QUESTIONNAIRE

Have you ever tried:

- Beer, wine, or alcohol _____
- Marijuana _____
- Ups (speed, whites) _____
- LSD (acid) _____
- Downers (quaaludes) _____
- Cocaine _____
- Peyote _____
- Sniffing _____

How many times have you sniffed something this school year (since August, 1980)?

- Never _____
- Once _____
- 2 to 3 times _____
- 4 to 9 times _____
- 10 or more times _____

What do you usually sniff? _____

What is the reason you sniff?

- Curiosity _____
- Kicks _____
- On a dare _____
- Friends do _____
- Escape from frustration _____

How old were you when you first sniffed something to get high? _____

How much do you sniff?

- Just enough to get high _____
- Until stagger or drop things _____
- Until stagger or come close to it _____

VITA

John L. Wingert

Candidate for the Degree of
Doctor of Philosophy

Dissertation: Inhalant Use Among Native American Adolescents: A
Comparison of Users and Nonusers at Intermountain
Intertribal School

Major Field: Psychology (Professional-Scientific)

Biographical Information:

Personal Data: Born in Milwaukee, Wisconsin, January 18, 1952,
son of Mr. and Mrs. Melvin Wingert; married to Corinne K.
Misaki on June 15, 1976.

Education: Attended elementary school in Milwaukee, Wisconsin;
graduated from Don Bosco High School in 1970; received a
Bachelor of Science degree from the University of
Wisconsin-Whitewater with a major in Psychology in 1974;
received the Master of Science degree from the University of
Wisconsin-Milwaukee with a major in Educational Psychology,
specializing in School Psychology in 1975; completed
requirements for the Doctor of Philosophy degree,
specializing in Professional-Scientific Psychology, at Utah
State University in 1982.

Professional Experience: 1981-1982, clinical psychology intern,
Veteran's Administration, Honolulu, Hawaii; 1979-1981,
clinical assistantship, Exceptional Child Center, Utah State
University, Logan, Utah; 1976-1979, child psychologist,
Kapiolani-Children's Medical Center, Honolulu, Hawaii; 1976,
substitute teacher, State of Hawaii, Hoolehua, Hawaii;
1974-1976, substitute teacher, Milwaukee Public Schools,
Milwaukee, Wisconsin.