University of Alberta

An evaluation of the stated student outcomes of the Drug Abuse Resistance Education (DARE) program

by

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Dedication

Dedicated to the memory of my late husband, Dr. Gordon R. Finch,

because I believe that you believed that I could.

Abstract

The purpose of this study was to evaluate the stated student outcomes of the Drug Abuse Resistance Education (D.A.R.E.) program including decreases in positive attitudes toward the use of abusable psychotropics and decreases in the self-reported use of the abusable psychotropics. A multivariate quasi-experimental (pre-test, post-test, post-test) design was used and data were collected measuring student demographics, reported drug use, and drug-related attitudes. Participants were 522 grade five and six students from 44 classrooms. Results indicated that the Drug Abuse Resistance Education program had little lasting effect on drug-related attitudes and reported drug use. The findings are stratified by evaluated risk of substance abuse to determine whether there was a differential effect of the Drug Abuse Resistance Education program on subgroups delineated by risk for abusable psychotropic use. Recommendations are made in relation to the findings of this study with regard to pedagogy, programming and possible factors that inform the decisions about abusable psychotropics among this population.

Although these findings represent conditions and views at the time of data collection and reflected in the initial literature review, they remain relevant as the issues and motivations that inform the decisions that young people make with regard to the use of abusable psychotropics, as reflected in the second literature review, continues to be an area of significant concern. The matter of devising and implementing timely, effective programming to address the complex problem of abusable psychotropic use by young people remains a relevant issue.

Acknowledgement

I would like to thank my initial supervisors, Dr. L.A. Pagliaro and Prof. A.M. Pagliaro, for their support through the beginning of this process. I wish to extend my sincere thanks to Dr. H. Janzen who was willing to supervise me through the completion of my work to allow me to keep this work alive and to complete my dream.

As well, I want to thank my colleagues, especially “Sir,” for support in innumerable ways and their belief that I really could complete this project at the times when my belief was wearing thin. Your understanding, support and belief in the worth of this project kept me going through times when things were almost insurmountable.

Last, and certainly not least, I want to thank my family, my parents, my sisters, and their families; Yianis; my husband’s family; and most of all, my sons, Alexander and Sebastian. Thank you for covering for me, picking up the slack, and just being there for me through everything. Thank you for being the hand that lifted me up, the source of unending strength, and for your unswerving belief in me.

To all of you, I can never thank you enough.

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Chapter 1

Background

Abusable psychotropic (illicit and prescription drug) use has become a leading social problem in North America (Pagliaro & Pagliaro, 1996). Exposure to and use of the various abusable psychotropics is not restricted to any age group across the life span. People can be exposed to abusable psychotropics, intentionally or unintentionally, from conception to death (Pagliaro & Pagliaro, 1996).

North American society overtly rejects, but covertly tolerates, through some media reports, the use of the abusable psychotropics in certain subgroups of the population (e.g., entertainers, sports figures) providing a mixed message at best, or a double standard at worst, with regard to the use of abusable psychotropics (Kolata, 1996). Such information regarding abusable psychotropics, both licit and illicit, is likely confusing to some individuals in society, especially children who are both impressionable, and because of developmental immaturity, may not appreciate the potential detriments and dangers of abusable psychotropic drug use.

Educational systems often do not provide appropriate information to children about the harm associated with abusable psychotropic use nor do they usually attempt to dispel misinformation. Indeed, in an effort to avoid providing information that may lead some students to “experiment”, many schools provide no information about abusable psychotropics or offer inaccurate “scare” information, allowing children to believe that the harm associated with abusable psychotropic use has been exaggerated (Pagliaro & Pagliaro, 1996). Beyond the schools, some community officials, parents, and educators share the view that provision of information with regard to abusable psychotropics would

actually encourage experimentation and use by children (Pagliaro & Pagliaro, 1996). Given the availability of abusable psychotropics and their potential for harm, examination of the outcomes (both envisaged and measured) of educational programs to reduce abusable psychotropic exposure and use appear warranted.

Some elementary schools have adopted programs that purport to decrease experimentation with abusable psychotropic use and inoculate children against later use. One such program, embraced by north–central Alberta schools, is the Drug Abuse Resistance Education (DARE) program (Pagliaro & Pagliaro, 1996). As interest has focused on prevention of the illicit use of abusable psychotropics and governments are pressured to be fiscally responsible, the necessity of evaluating the outcomes of prevention programs, such as the DARE program, is a priority.

Scope of the Problem

Estimates of abusable psychotropic use among children and adolescents indicate an increase in use following a 12- to 13-year decline (Pagliaro & Pagliaro, 1996). Research in Michigan found that abusable psychotropic use in a sample of grade eight students increased from 11 percent in 1991 to 21 percent in 1995 (Kolata, 1996). These results are consistent with increases in other geographic regions in North America. Some sources speak of a “new epidemic” of abusable psychotropic use, particularly among younger and younger children in North America (Pagliaro & Pagliaro, 1996).

The Mega Interactive Model of Substance Exposure and Use Among Infants, Children, and Adolescents

Any study of abusable psychotropic use must consider this as a complex, multifaceted problem. Programs that have been developed to decrease abusable

psychotropic use should therefore be multidimensional in their approach. Consequently, it would be logical that evaluation measures use a multidimensional framework to capture the effect, if any, of a program. The use of the Mega Interactive Model of Substance Exposure and Use among Infants, Children, and Adolescents (MIMSEUICA) (Pagliaro & Pagliaro, 1996), a multidimensional, interactive model, provides a useful framework to address the breadth, depth, and scope of the multitude of variables that need to be considered to evaluate an abusable psychotropic use prevention program such as the Drug Abuse Resistance Education program. An explanation of how this model and theory informs the design of this research study is provided.

Of the theories that attempt to explain abusable psychotropic use among children and adolescents, none have been completely successful in explaining abusable psychotropic use (Pagliaro & Pagliaro, 1996). The MIMSEUICA was developed to consider the combinations of variables that likely affect the decisions that children make with regard to the abusable psychotropics. The various dimensions of MIMSEUICA must be carefully considered in light of two main considerations: (a) not all children in a group use abusable psychotropics; and (b) the use of abusable psychotropics by a particular child may be related to a particular variable dimension or to a constellation of variable dimensions. In explaining their model, Pagliaro and Pagliaro stated:

> [The] Mega Interactive Model of Substance Exposure and Use among Infants, Children, and Adolescents can be used for assessing, developing, delivering, and evaluating individualized prevention and program programs aimed at infants, children, and adolescents who present with actual or potential problems related to substance exposure and use. The model consists of four interacting variable dimensions: 1) infant/child/adolescent dimension, 2) societal dimension, 3) substance dimension, and 4) time dimension. (p. 5)

The factors listed in the MIMSEUICA that the authors have found to be strongly related to abusable psychotropic use among children (Pagliaro & Pagliaro, 1996), are:

- Genetic Predisposition
- Depression
- Personality Disorders
- Risk-Taking Behaviour
- Economic Status (e.g., poverty)
- Gang Membership
- Peer Pressure
- Physical Abuse
- Sexual Abuse
- Culture
- Social Mores
- Availability
- Pharmacology

These factors have strong imperial support as they have been shown to correlate highly with the choices that children make with regard to the abusable psychotropics. A propensity for addictions appears to have an inherited pattern as part of their etiology, as the probands of individuals with addictions develop addictions at a significantly higher rate than the general population. Depression, personality disorders, and risk-taking behaviour have a genetic component to their makeup as well.

The presence of abuse (physical and/or sexual) is strongly linked to substance abuse disorders and to psychological disorders, especially mood disorders. As well, lower

social economic status (SES) correlates strongly with abusable psychotropic use. This factor in combination with a lack of identification with a culture and its social mores leaves children vulnerable to the influence of gangs and peer pressure.

The factors of availability and pharmacology have importance as no matter how "at risk" an individual may be—if the abusable psychotropic cannot be accessed, there is no potential for abuse. Degree of availability has a weighting as well, given that ease of access may dictate the choice, frequency, and volume of abusable psychotropic use. Pharmacology forms an important factor; a substance that does not possess psychotropic properties would be less likely to be abused. Length and strength of the primary effect, severity of unwanted side effects, and mode of delivery all have significant ramifications for possibility of and pattern of use.

It is the interactions of these factors that increase or decrease an individual's risk for the use of abusable psychotropics. It must be noted that these factors are based on population data, so individual cases may be predicted but cannot be determined with certainty, based on these factors.

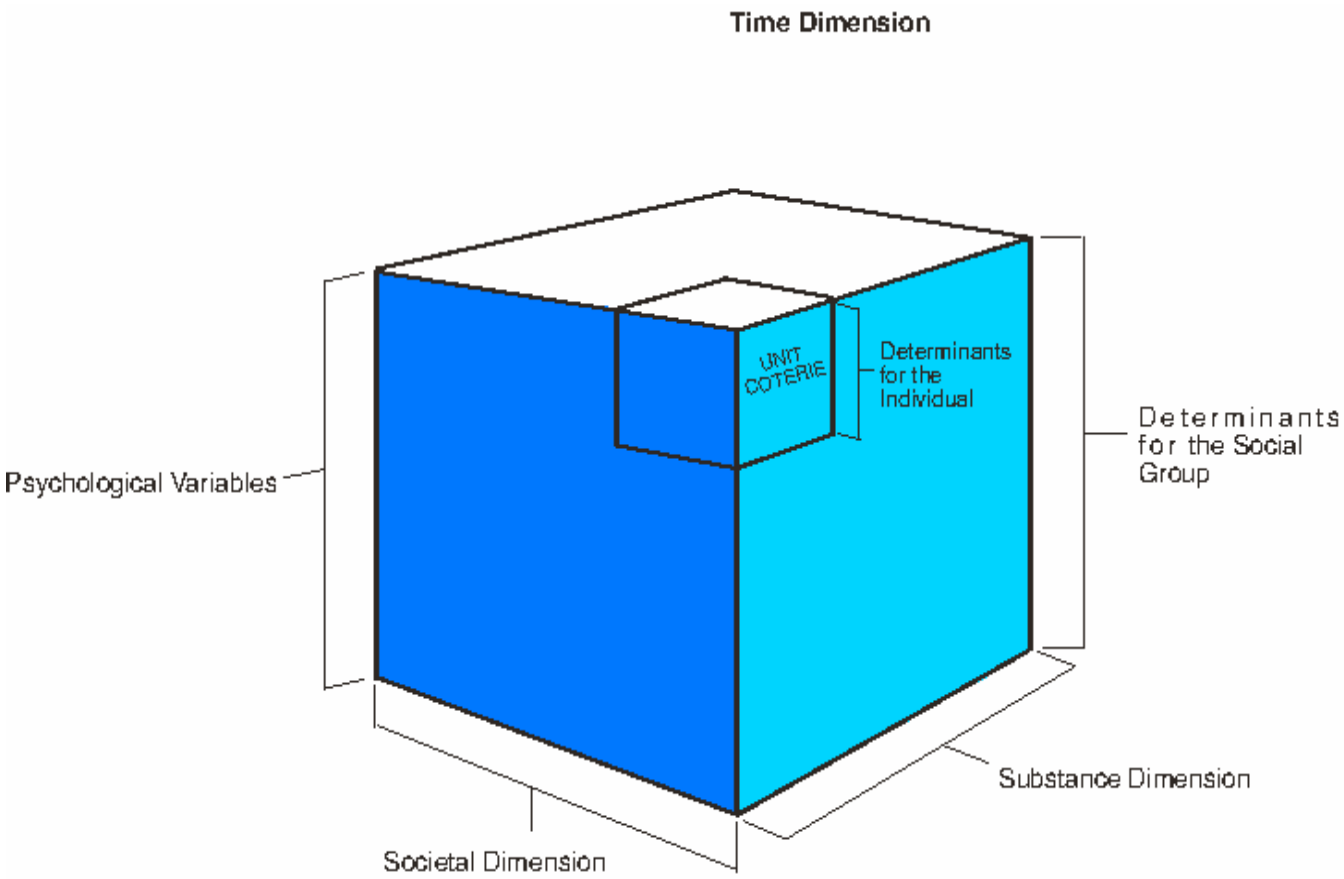

Figure 1. The Mega Interactive Model of Substance Exposure and Use Among Infants, Children, and Adolescents. (Source: Pagliaro & Pagliaro, 1996)

Prevention Strategies

Programs that attempt to reach children prior to their initial use of the abusable psychotropics—primary preventive programs—operate differently than secondary or tertiary programs, that target children and adolescents who display problematic patterns of abusable psychotropic use (Pagliaro & Pagliaro, 1996). These primary prevention programs subscribe to one of four basic theoretical perspectives: Information Only Model, Alternatives Model, Affective Educational/Social Competency Model, and Social

Environmental/Learning Model (Pagliaro & Pagliaro, 1996). In their review of these models, Pagliaro and Pagliaro found that the social environmental/learning model was the most effective, and programs based on this model have achieved a moderate level of success. The revised Drug Abuse Resistance Education 2 (DARE 2) program, based on a social environmental/learning model, was introduced in Alberta shortly after the time of the data collection for this study.

The original DARE program was a primary intervention program that used interactive and non-interactive teaching approaches, particularly information, affective, and social influence-based lessons. The original format was changed to increase the interactive and social influence-based focus, after Ringwalt et al. (1994), in their meta-analysis and review of the DARE program, found that interactive social influence-based programs have a greater effect size than do other types of programs. The revised DARE curriculum (DARE2) remained a primary prevention program that incorporated refinements from the social environmental/learning model. The following studies relate to outcome evaluations of the DARE program, as it was provided in the United States and Canada, as the newer DARE 2 program was not fully implemented until after the data for this study was collected.

History of Drug Abuse Resistance Education

The DARE program was developed in 1983 by the Los Angeles Unified School District health education specialist, Dr. Ruth Rich. The original program was a cooperative effort of local school districts and law enforcement agencies. The curriculum was intended for use primarily with children in grades five and six, although the current curriculum spans kindergarten through grade 12, and a parent component was added

later. The original core curriculum was revised for the 1994–95 school year and emphasized a life-skills based, non-use message, that focused on peer pressure resistance training, self-concept improvement, personal safety, and decision-making skills (Los Angeles Unified School District, 1994).

The primary goal of the DARE program is to prevent abusable psychotropic use among school age children (Los Angeles Unified School District, 1994). The program placed specially trained, uniformed police officers in classrooms for a 17-week period. The officers presented weekly one-hour lessons focussing on drug abuse resistance for grade five and six students.

The DARE program was first introduced in Canada in 1989 (EPS doc, undated). Eight Canadian police forces have trained DARE officers, and interest in the program has grown since its inception. Most of the programs are in western Canada with a few in the territories to the north of these provinces. Interest in DARE within central Canada and the Maritimes is much more limited. The principal site for the coordination of the DARE program in Canada is K division of the Royal Canadian Mounted Police (RCMP) in Edmonton, Alberta.

The number of Canadian schools offering the DARE program has increased. Nevertheless, expansion of any program has fiscal considerations that often require study to justify continued use of limited monetary and scheduling resources. The benefits associated with such programs and any unanticipated consequences also require attention.

Based on the preceding information and the dramatic increase in the range of relatively inexpensive abusable psychotropics available to children and adolescents in Alberta (e.g. crystal meth), as well as a trend toward a younger age of experimentation

and abuse, the need for effective prevention programs cannot be overstated. Since the data collection for this study was completed there has been a rapid proliferation of such inexpensive abusable psychotropics and a rise in the creation and manufacture of "designer" drugs (e.g. ecstasy) as well as active marketing to a younger population (pre-teens). Abusable psychotropics that were unknown or unavailable in the late 1990s, such as methamphetamine, ecstasy, and "smokeable" heroin, can now be commonly found in Alberta cities and many towns.

With some exceptions, drug manufacture and sales continue to be an internationally based, multibillion-dollar business. The loss of potential, both economic and emotional, as the result of drug use, continues to have enormous ramifications for society. As well, the financial and personal cost of the by-products of abusable psychotropic use, lost productivity, rehabilitation, incarceration, health care costs, and even premature mortality in some instances, have an effect upon societal productivity and economics.

Historical data seem to support the idea that prevention of abusable psychotropic misuse is much less costly, even in only monetary terms, than rehabilitation and the other associated costs of abuse. While the "war on drugs" was conceptualized as decreasing the supply of abusable psychotropics thus limiting abusable psychotropic use through control of availability, a potentially more successful strategy of systematic education using prevention programs appears more promising, since if individuals do not begin using psychotropic drugs, then demand for them will diminish.

The program most commonly used in Alberta schools at the time of this study was the DARE program. As is evident in the following literature review studies of the

efficacy of the DARE program are mixed, and many contain flaws that render the conclusions tentative at best. Given that DARE was the primary abusable psychotropic prevention program in use in Alberta at the time that this study began, a consideration of the outcomes of the program in north–central Alberta schools was considered appropriate. An evaluation of the stated student outcomes of the DARE program as provided in these jurisdictions was completed to uncover the strengths and weaknesses, and to help inform decisions regarding the continuation of this and similar programs.

The variables of this research project are defined as follows:

- Drug Abuse Resistance Education (DARE) program (independent variable): A 17-week Drug Abuse Resistance Education curriculum (revised 1994), as administered in school classrooms by specially trained Drug Abuse Resistance Education officers of the Royal Canadian Mounted Police.
- Attitudes (dependent variable): A relatively enduring organization of beliefs around an object or situation predisposing a person to respond in some preferential manner (Pagliaro & Pagliaro, 1996, p.94), as measured by the self-report questionnaire specially designed for this study (see Appendix C).
- Reported abusable psychotropic use (dependent variable): the frequency of use of alcohol, marijuana, and tobacco as measured by the self-report questionnaire specifically designed for this study (see Appendix C). Abusable psychotropics are exogenous substances (chemicals, drugs and xenobiotics) that elicit a direct effect on the central nervous system resulting in changes in cognition, learning, memory, behaviour, perception, or affect that are consistently associated with physical and/or mental dependence (Pagliaro & Pagliaro, 1996, p.3). More

specifically, these were identified as alcohol, marijuana, smokeless tobacco, and tobacco, the abusable psychotropics specifically addressed in the Drug Abuse Resistance Education program.

Chapter 2: Literature Review

The initial literature review, covering earlier relevant research up to 1996, was completed at the time of candidacy. An interruption of work on the dissertation occurred as the result of an unfortunate family situation, and resumed in 2006. In consequence, a second literature review, focusing on the relevant research subsequent to 1996, is included as the second portion of this chapter.

Evaluation of the DARE Program

The original outcome studies of the DARE program, completed during 1987 to 1989, were generally positive. One study reported strongly positive findings regarding the effectiveness of the DARE program (McConnell, 1988). However, the findings of later studies were mixed regarding the effectiveness of the DARE program, especially considering its long-term effects. This section will review these later evaluation studies.

The DARE Program in the United States

A number of U.S. studies of the DARE program have been published since the inception of the program and present mixed findings. A study conducted in Kokomo, Indiana, compared 678 fifth grade students to a previously conducted Los Angeles, California study evaluating DARE. In the former study, outcomes were measured by a multifaceted framework of impact and process evaluations based on pre- and post-test questionnaires assessing locus of control; drug attitudes and knowledge; ability and willingness to invoke drug-resistant coping skills (Aniskiewicz & Wysong, 1990). The reported coping skills of Kokomo students were significantly higher than those of the Los Angeles students. Significant improvement at post-test was found in drug information and knowledge. Marginal improvement in locus of control also was found. In addition,

positive community support, assessed by a symbolic politics dimension, was reported (Aniskiewicz & Wysong, 1990). Unfortunately, the study lacked an appropriate comparison group. Another limitation was the extremely brief period of time that elapsed between pre- and post-test measurements (i.e. weeks rather than months).

Another study conducted during the 1988–1989 school year examined the effect of the DARE program on use of abusable psychotropics by 3,000 Long Beach, California, fifth grade students. Self-report survey data were collected at both pre- and post-intervention. This population reported minimal abusable psychotropic use. However, the use of cigarettes was reported by 10% of the students, and beer and wine by 15 % of the students, indicating some licit abusable psychotropic use (Becker, Agopian, & Yeh, 1992). Although exposure to the DARE program did not significantly alter abusable psychotropic use, knowledge about abusable psychotropics and awareness of ways to resist solicitations from friends to use abusable psychotropics increased (Becker et al., 1992).

A Charleston County, South Carolina, study compared 341 fifth grade students who participated in a 17-week DARE program with 367 students who did not receive the DARE program. Significant positive differences were found for the DARE group in relation to self reported alcohol use, belief in pro-social norms, association with non-abusable psychotropic using peers versus abusable psychotropic using peers, attitudes against abusable psychotropic use, and assertiveness. However, no difference was found in regard to cigarette, tobacco, or marijuana use in the past year, frequency of any abusable psychotropic use in the past month, attitudes about police, coping strategies,

attachment and commitment to school, rebellious behaviour, and self-esteem (Harmon, 1993).

A longitudinal study examining the effect of the DARE program on attitudes, beliefs, and abusable psychotropic use of 1,584 students at one year following exposure to the program found that the DARE program had no statistically significant effect on abusable psychotropic use and little effect on attitudes or beliefs about abusable psychotropics (Rosenbaum, Flewelling, Bailey, Ringwalt, & Wilkinson, 1994). However, significant interactions between the DARE program and other factors suggested the program may have varied effects across subgroups of the population sampled (Rosenbaum et al., 1994).

Wysong, Aniskiewicz, and Wright (1994) used a survey methodology to compare 288 high school students exposed to the DARE program in grade seven and 335 high school students not exposed to the DARE program. They found no significant differences in abusable psychotropic use or attitudes toward abusable psychotropics. Qualitative analysis supported the quantitative findings. The need for multifaceted discussion of drug prevention programs, with consideration of the merit of psychosocial and structural approaches, was highlighted (Wysong et al., 1994).

A study of the DARE program in four cohorts of 9,552 students comprising 440 classrooms indicated a “reactive pre-test effect.” Maturation resulted in lower self-esteem, weaker strategies for efficacy, and weaker institutional bonds (Dukes, 1994). When pre-test effects and maturation were controlled, students who received the DARE program reported higher self-esteem, greater resistance to peer pressure, stronger institutional bonds, and less acceptance of risk behaviour. Both the experimental and the

comparison groups reported negative attitudes toward abusable psychotropic use. This finding suggests that a negative climate for abusable psychotropic use already existed in junior high schools prior to programming (Dukes, 1994). Although students and adults rated the program highly, a follow-up survey administered found no significant effect for the DARE program (Dukes, 1994).

A second study by Dukes and colleagues examined the effect of the DARE program on self-esteem, institutional bonds, endorsement of risk behaviour, and resistance to peer pressure. Maturation and pre-test sensitization were controlled by a Solomon Four Group design with these latent variables. The results of this study, which sampled 10,000 students in 440 classrooms, indicated that the students who had taken the DARE program reported greater self esteem, stronger institutional bonds, and endorsed fewer risk behaviours than students who did not participate in the programming (Dukes, Ullman, & Stein, 1995). Pre-test sensitization only affected resistance to peer pressure. However, maturation factors resulted in lower self-esteem and weaker institutional bonds (Dukes et al., 1995).

A quasi-experimental study of the outcomes of the DARE program in elementary schools in a small, predominantly white, suburban New Jersey township found few recorded abusable psychotropic related offenses for the sample of 100 ninth grade students who participated in the study(Kochis, 1995).. However, the finding was explained as possible non-apprehension rather than lack of actual abusable psychotropic use. The authors brought into question the reliability of the self-report measures commonly used in outcome studies of the DARE program (Kochis, 1995).

A survey of 21 classrooms of ninth grade students, who received the DARE program in sixth grade, compared to a control of 17 classrooms of grade nine students, found no significant difference between participants and controls on self esteem, resistance to peer pressure, delay of experimentation with abusable psychotropics, and abusable psychotropic use (Dukes, Ullman, & Stein, 1996). The authors contended that the lack of significant long-term effects were due to attenuation of effect and the anti-drug context of schools (Dukes et al., 1996).

A five-year, longitudinal study of the effectiveness of the DARE program in 23 elementary schools randomly assigned to receive DARE and eight designated comparison schools found no significant difference between intervention and comparison schools on cigarette, alcohol, or marijuana use one year and five years after completion of the program (Clayton, Cattarello, & Johnstone, 1996). The DARE students received 16 weeks of protocol driven instruction, while control students received an abusable psychotropic education unit as part of their health curriculum. All students in sixth grade were pre-tested prior to the delivery of the programs. A post-test was administered to all students at completion and surveys were completed each year through 10^{th} grade. Significant intervention effects were observed for DARE students over controls at seventh grade for general and specific attitudes toward abusable psychotropics, resistance of peer pressure, and estimated level of abusable psychotropic use by peers. However, over the five-year interval, the trajectory for these outcomes was similar for the intervention and control conditions (Clayton et al., 1996).

Other Related U.S. Studies

A qualitative study of the California Drug, Alcohol, and Tobacco Education (DATE) program raised concern regarding the effect of state policy on students at risk for abusable psychotropic use in regard to shaping perceptions, and influencing program directions for both at risk and thriving students (Brown & Caston, 1995). This risk-oriented state policy influenced educators in this study to use a risk factor model to shape services to identify at-risk students. Primary prevention programs, like the DARE program, provided evidence of few positive effects for at-risk or thriving students (Brown & Caston, 1995). Although the DATE program was designed to assist at-risk students, identification of at-risk students often preceded detention, suspension, or expulsion rather than assistance. The researchers questioned the validity of a risk factor model for effective school-based abusable psychotropic use prevention (Brown & Caston, 1995).

A study that evaluated the Gang Resistance Education and Training (GREAT), a program related to the DARE program in the United States, found that although the GREAT program (like DARE) had a minimal effect on children, it was useful in promoting particular political views and served as public relations for various stakeholders (Palumbo & Ferguson, 1995). This study illuminated some of the specific agendas, often political, that can influence such programs.

A report comparing the DARE program and a pilot program, All Stars, found students who received the All Stars program had significantly better outcomes on reported commitment to avoid high-risk behaviours, ideals discrepant with high-risk behaviours, bonding with pro-social institutions, and conventional beliefs about high-risk behaviours, when compared to students who received the DARE program in seventh

grade (Hansen, 1996). The All Star students reported superior ratings due to involvement in the program (Hansen, 1996). Without a control group or knowledge of any pre-existing differences between the two program groups, it is difficult to formulate conclusions regarding the All Star program.

The DARE Program in Canada

A quasi-experimental study in Victoria, British Columbia, of 463 grades five, six and seven students found the DARE program had a statistically significant effect on abusable psychotropic knowledge, but not on reported abusable psychotropic use or attitudes toward abusable psychotropic use (Walker, 1990). The study used seven DARE schools and four control schools matched for similar demographics. A pre- and post-test design was used and change was analyzed at the aggregate or classroom level (Walker, 1990).

The DARE Program Internationally

In their review of abusable psychotropic use prevention research in the United States, Australia, and the United Kingdom, Williams and Keene found general interactive skills based programs were more useful than more directive and didactic police-led initiatives. Integration of programs into the established school curriculum and use of prepared teachers to deliver the programs were identified as important (Williams & Keene, 1995). The value of a multidisciplinary approach that emphasized partnership between teachers, police, and parents, and that stressed the importance of community involvement in the development of any school-based program was highlighted. Williams and Keene also emphasized the need to determine whether schools should be predominantly concerned with programs of abusable psychotropic use prevention or harm

minimization. As indicated by these researchers, the limitations of research at that time, including: evaluation constraints; the small number of longitudinal studies; and interaction of the effects of police input with the program, need to be addressed. Evaluation studies identified increased knowledge about abusable psychotropics; however, no significant immediate or long-term changes in attitudes toward abusable psychotropics or abusable psychotropic use were found (Williams & Keene, 1995).

The results provided by the evaluation of these studies (1990–1996) of the original and the revised DARE programs are mixed. Moreover, such studies often suffered from severe limitations in design, methodology, and analysis (see Table 1). Many studies of the DARE program failed to include, or implement, appropriate evaluation designs to test the effectiveness of the program. While some suggestions for further directions in design and statistical analysis were provided (McNeal & Hansen, 1995), the limitations inherent in these studies mean that conclusions and predictions are limited and tenuous. Therefore, further evaluation of the DARE program was required, with greater attention to a more robust design and validation of measures.

Author(s)	Subjects	Grade	Study Site	Study Design	Major Limitations	Results
Aniskiewicz & Wysong (1990)	678	5	Kokomo, IN	quasi-experimental	no control group	positive for information and knowledge
Walker (1990)	463	5, 6, and 7	Victoria, BC	quasi-experimental	small control	positive for knowledge; negative for use and attitudes
Becker, Apogian, & Yeh (1992)	3,000	5	Long Beach, CA	quasi-experimental	no control group	positive for information and knowledge; negative for use
Harmon (1993)	708	5	Charleston, SC	quasi-experimental	program and control groups differed	positive for information and knowledge; negative for use
Rosenbaum et al. (1994)	1,584	junior high	Chicago, IL	longitudinal	no pre-test and no control	differential effect on subgroups
Wysong et al (1994)	623	high school	Kokomo, IN	quasi-experimental and qualitative	no pre-test	negative for use and attitudes
Dukes (1994)	9,552 440 classes	5 and junior high	Los Angeles, CA	quasi-experimental	pre-test and maturational effects	positive effects decrease over time
Dukes, Ullman, & Stein (1995)	10,000 440 classes	5 and junior high	Los Angeles, CA	quasi-experimental	pre-test and maturational effects	positive effects decrease over time
Kochis (1995)	100	9	NJ	quasi-experimental	no control and no pre-test	low record of drug offenses
Dukes, Ullman and Stein (1996)	38 classes	9	Los Angeles, CA	longitudinal	maturational effects	no significant long-term effects
Clayton, Cattarello and Johnstone (1996)	31 school	6 to 10 yearly	KY	longitudinal	maturational effects	no effect on use over time

Table 1. DARE Evaluation Studies (1990–1996).

Literature since 1997

Although most of the studies concerning DARE were conducted prior to 1997, a review and examination of subsequent studies was appropriate to set the findings of this study into the present context. The criteria for inclusion and exclusion comprised: studies entailing DARE or DARE-based programs; studies related to DARE programs; and articles related to substance related disorders, or to health education or health promotion, but which were not related to the DARE program itself. As a result 16 relevant articles were found to meet these criteria.

These articles were then separated into three groups: (1) outcome evaluations of the original DARE program and related updated programs (11 studies); (2) evaluations of "stakeholder" attitudes to the DARE program (4 studies); and (3) an evaluation of the "mis-measure" of the outcomes of DARE, including a rationale for ignoring the outcome evaluation to date (one study). Each of these areas was addressed sequentially to place the findings of this study in the current "state of knowledge" with regard to the efficacy of the DARE program.

Within the first grouping, outcome evaluations of the original DARE program and related updated DARE programs, Zagumny and Thompson (1997) suggested that time, rather than participation, produced lower alcohol and drug use, and that adolescents did not delay use of alcohol or drugs based on program participation. They stated that the DARE program had limited utility when assessed by this outcome.

A report by the Oklahoma Criminal Justice Resource Center (1998) found that DARE training improved interactions between students and law enforcement agents but did not deter later use of the abusable psychotropics. No statistically significant

difference was found between participants and non-participants regarding later abusable psychotropic use.

However, a 1998 study by Donnermeyer and Davis found that grade 11 students who participated in a prevention education activity had lower mean scores for drug involvement than students who had never participated. The lowest mean scores occurred among students who had participated in multiple prevention activities. In this study, drug involvement included a broader range of drug related measures than reported drug use alone.

Ten years after their programs, Lynam et al. (1999) found few differences in drug use, drug attitudes, or self-esteem between those participants who received DARE education and those who received a standard drug-education curriculum. No comparison to a control group was given, so any “effect” of the DARE program was equal to standard drug education.

Thombs (2000) examined substance use among undergraduates to assess long-term effects of the DARE program. Results indicated no substantial differences in substance use between groups reporting participation in a grade five DARE program and non-participants. Based on these findings the author questioned the efficacy of the DARE program on drug use almost 10 years after the provision of the program.

In contrast, Ahmed et al. (2002) found that the DARE group had significantly higher knowledge of the risk of smoking with strong opposite correlation to smoking behaviour and a significantly lower rate of smoking compared with the non-DARE group. These researchers concluded the DARE program had an impact on prevention of the initiation of smoking behaviour.

Kanof (2003), when evaluating the literature for the United States government, found no significant differences in illicit drug use between DARE and control students, and suggested that DARE education had no statistically significant long-term effect when the prevention of youth illicit drug use was considered. Similarly, Perry et al. (2000) postulated a comparison evaluation of junior high DARE education alone; DARE Plus, junior high DARE with additional parent involvement, peer leadership, and community components; and a control group. Following completion of the study, Perry et al. (2003) reported no significant differences between DARE education and control groups, and no behavioural differences among girls. Significant differences were reported among boys between DARE Plus and control groups for tobacco, alcohol, and multi-drug use, and among boys between DARE Plus and DARE education in tobacco use and violence. In this study, DARE education, enhanced with additional parent involvement, peer leadership, and community components (DARE Plus) significantly increased the effectiveness of the DARE curriculum among boys, and the authors supported a significant role for multiyear, multi-component prevention programs.

A further caution on the utility of reported drug use data in evaluation of the DARE program was provided by Fendrich and Rosenbaum (2003) when they analyzed recanting of substance use reports for lifetime use of alcohol, alcohol to get drunk, cigarettes, marijuana, and cocaine. Recanting rates for lifetime reports of alcohol use were high (45%) when assessed immediately following first disclosure according to these researchers. This phenomenon would place any drop in drug use reported after the DARE program in question; however, a similar drop in the control group report could be anticipated, leaving any disparity to remain unexplained.

A further meta-analysis by West and O'Neal (2004) on the effectiveness of *Project DARE* in preventing alcohol, tobacco, and illicit drug use among school-aged youths suggested the DARE program was ineffective as effect size was small and non-significant. This finding is consistent with the findings in the literature review of initial research. Moreover the limitations of the later studies are the same as those identified in the earlier studies, (see Table 1).

Considering the articles in the second group, with regard to evaluations of "shareholder" attitudes to the DARE program, an article by Lisnov et al. (1998) found school-based programs such as Project DARE were rated by students as significantly more effective than passive media messages, and that students, categorized by frequency of alcohol use (nonusers, infrequent users, and frequent users) differed significantly in their ratings of programs. This finding supported the potential importance of risk as a factor for consideration in outcome evaluation.

Curtis (1999) assessed effectiveness of the DARE program by assessing attitudes of students, teachers, and parents toward DARE education. He found wide acceptance of the DARE program as a necessary drug resistance program, and support for continuation of the DARE program in West Vancouver schools. A positive effect on students' attitudes toward police was noted, and strengthened bonds between police, school, and community were cited as positive "outcomes" of the program.

Donnermeyer (2000) analyzed parents' views of the DARE program as the researcher believed that parental perceptions influenced students' attitudes and behaviours around drug use. Parental involvement and knowledge of the DARE program was high in this survey and parents regarded the program positively especially if they

considered the DARE officer to be an effective educator. This study again focused on the outcome of perception of efficacy rather than measures of actual self-reported participant behaviour.

In his master's thesis, Fisher (2000) used interviews to measure teachers', school principals', and School Resource Officers' perceptions of the curricular content, program delivery, and efficacy of the DARE program in southern Alberta. While curricular content and program delivery were viewed positively, the efficacy of the program was judged less positively, but this did not effect the decision to continue the program. These results are consistent with findings in the literature with regard to the popularity of the DARE program, even though limited effects on student drug use were reported.

In the third area, an article by Birkeland, Murphy-Graham, and Weiss (2005) tied the previous two areas together. In their article they discussed the findings that although evaluations of the DARE program have found positive effects on knowledge, attitudes and behaviour these effects fade over time, so that the program and control groups are indistinguishable, based on the evaluation instruments used, by late adolescence. In spite of such findings, some school districts continue to support the DARE program. The main reasons reported for supporting the DARE program were that school districts did not believe that adolescent drug-taking behaviour was changed by a single short-term program, therefore measures of drug use were not a consideration; and that school districts placed high value on the enhanced school and community partnerships with police departments the DARE program offered.

Author(s)	Results
Zagumny and Thompson (1997)	program participation had no effect on alcohol/drug use
Donnermeyer and Davis (1998)	program participation lowered mean scores for drug involvement; lowest mean scores for students who participated in multiple programs
Lisnov et al. (1998)	DARE rated more effective than passive media messages ratings differed by level of alcohol (nonuse, infrequent/ frequent use)
Oklahoma Criminal Justice Resource Center (1998)	DARE improved interactions students and law enforcement did not affect later use of the abusable psychotropics
Curtis (1999)	positive effect on students' attitudes toward police strengthened bonds between police, school, and community
Lynam et al. (1999)	DARE program was equal to standard drug education
Donnermeyer (2000)	focused on perception of efficacy rather than participant behaviour
Fisher (2000)	curricular content and program delivery viewed positively with efficacy viewed less positively, however decided to continue program
Perry et al. (2000)	suggested comparing junior high DARE/DARE Plus/junior high DARE with parent involvement, peer leadership, and community/control group
Thombs (2000)	no substantial differences in reported substance use between undergrads who participated in a grade five DARE program and non-participants
Ahmed et al. (2002)	DARE program had an impact on prevention of the initiation of smoking behaviour
Fendrich and Rosenbaum (2003)	caution on reported drug use data in evaluation of DARE program found recanting rates for lifetime reports of alcohol use at 45%
Kanof (2003)	no significant differences in drug use between DARE and control no statistically significant long-term effect on youth illicit drug use
Perry et al. (2003)	DARE Plus increased effectiveness of the DARE curriculum among boys research supported multiyear, multi-component prevention programs
West and O'Neal (2004)	DARE program was ineffective as effect size was small and non-significant
Birkeland, Murphy-Graham, and Weiss (2005)	positive effects on knowledge, attitudes and behaviour fade over time program and control groups indistinguishable by late adolescence

Table 2. DARE Evaluation Studies (1997–2006).

In its entirety, the review of literature shows that the effectiveness of both the original and the revised DARE programs were mixed. Moreover, most studies were limited both in design and analysis, and failed to include, or implement, appropriate evaluation designs to test effectiveness. While some studies considered other "value added" outcomes of DARE programs, the reviewed studies do not support the contention

that DARE programs are effective as a means to eradicate or prevent drug use among youth. Except for Lisnov et al. (1998), risk factors were not explored as a factor in choices youth made around the use of abusable psychotropics. This quasi-experimental study of the stated student outcomes of the DARE program provides a unique contribution to the literature as the theoretical framework of the MIMSEUICA was used to ground the evaluation in theory. This model was also used to assist with the process of evaluating the alignment of the program and comparison groups on the 13 factors of the theoretical model that inform the decisions young people make with regard to abusable psychotropic use. Use of this model to ground the research in theory and to assist with the comparison of the study groups has not been undertaken in the extant literature to date.

Study Questions and Hypotheses

Using the Mega Interactive Model of Substance Exposure and Use Among Infants, Children, and Adolescents (MIMSEUICA) (Pagliaro & Pagliaro, 1996) as a theoretical framework within which to evaluate the stated student outcomes of an abusable psychotropic use prevention program for children using a quasi-experimental design, and having reviewed what has been done previously regarding adolescent substance abuse prevention incorporating the use of DARE programs, the following questions were posed:

1. Did the DARE program have an effect on self-reported attitudes toward the use of abusable psychotropics targeted by the DARE curriculum (i.e., alcohol, tobacco, and marijuana)?

2. Did the DARE program have an effect on self-reported use of the abusable psychotropics targeted by the DARE curriculum (alcohol, tobacco, and marijuana)?
3. Did the DARE program have different outcomes in attitudes toward and use of the abusable psychotropics targeted by the DARE curriculum (i.e., alcohol, tobacco, and marijuana) for subgroups of the target population?

Goals

The previous questions were further refined into the following goals for this study:

1. To ascertain the effect of the D.A.R.E. program on the self-reported attitudes toward and use of the abusable psychotropics targeted by the DARE program.

2. To evaluate if a differential effect exists, with regard to goal one, on subgroups of the program population delineated by risk of abusable psychotropic use as outlined in the MIMSEUICA (Pagliaro & Pagliaro, 1996).

Objectives

The above goals were further refined into the following specific objectives for this study:

1. To determine if there is an effect on self-reported attitudes toward the use of abusable psychotropics targeted by the DARE curriculum (i.e., alcohol, tobacco, and marijuana).

2. To determine if there is an effect on self-reported use of the abusable psychotropics targeted by the DARE curriculum (i.e., alcohol, tobacco, and marijuana).

3. To determine if there are different outcomes in attitudes toward or use of the abusable psychotropics targeted by the DARE curriculum (i.e., alcohol, tobacco, and marijuana) for subgroups of the target population.

Null Hypotheses

The above objectives were the basis of the following null hypotheses:

1. There was no significant difference in attitudes toward abusable psychotropic use between a cohort of students who have participated in the DARE program and a cohort who have not participated in the DARE program.
2. There was no significant difference in self-reported use of abusable psychotropics between a cohort of students who have participated in the DARE program and a cohort who have not participated in the DARE program.
3. There was no significant difference between subgroups, delineated by risk, in the program and comparison populations with regard to attitudes toward or use of abusable psychotropics.

Chapter 3: Method and Procedure

Pilot Study

Following approval to conduct research, a pilot study was conducted in March 1998, in classrooms in three schools in an urban school district in Alberta. City police officers provided the DARE program in those classrooms. The principals of the schools gave approval to send information letters and permission slips to the parents or guardians of the potential participants. Given the ethnic diversity of the areas served by the schools, the covering letters and permission slips were translated into Mandarin, Vietnamese, and Cambodian to ensure that the parents or guardians provided informed consent. The instruments themselves, and their administration was conducted in English as the school staff reported all the children had sufficient English to understand and respond to the instructions and questionnaires. Three classrooms of 30 students each were invited to participate in the pilot study. All 90 students, who had all completed the DARE program, chose to participate and completed a pretest and posttest measure. Data were collected in April of 1998, and were analyzed in July and August of 1998. Some interesting trends with regard to student knowledge of which beverages contain alcohol, the presence of experimentation with alcohol and tobacco, and peer pressure from other students in the school were revealed that were explored further in the main study.

The Pilot Study was found to be useful to test and refine the research design and the protocols with regard to administration of the protocols. For example, the protocols were read to all participants so that reading level was not an issue with the students and the students were isolated from each other to decrease collaboration. Some modification of the items occurred to make the items easier to understand based on the clarification

requests from the pilot study participants. As considerable interest was shown by stakeholders in the study, general findings of the pilot study were presented at the annual meeting of the Canadian Association of Chiefs of Police in August of 1998. Two hundred and fifty chiefs of police from across Canada with their senior administration staff, as well as people from the Alberta Justice Department attended this presentation.

Logistical Issues

Requests were made during the remainder of 1998 to conduct the main study in the same school jurisdiction as the pilot study. Unfortunately, policy changes in that school jurisdiction as well as difficulties in maintaining communication because of personnel changes meant that it was impossible to conduct the main study in that school jurisdiction.

Subsequently, by 1999, the main study was initiated in four school jurisdictions in Alberta not located in major metropolitan areas. Data collection was completed in all program and comparison classrooms by the end of September 2000.

Main Study

Jurisdictional Issues

Permission was obtained from multiple administrative levels in several stakeholder organizations to implement the study, as noted in Figure 2, which shows schematically the administrative levels found within each of the organizations that participated in the main study.

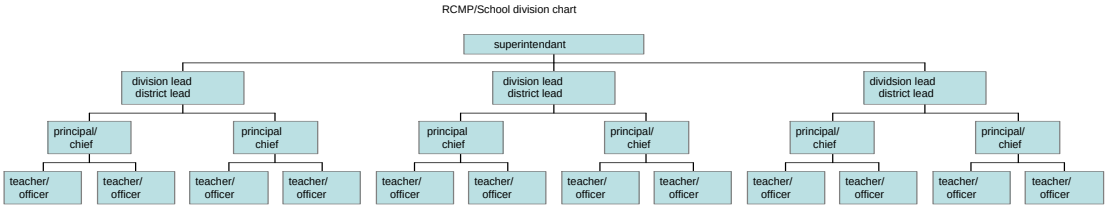

Figure 2. The Organizational Chart of the RCMP and the School Divisions.

The Royal Canadian Mounted Police

The RCMP K division provided the DARE program to school jurisdictions in Central and Northern Alberta outside of the city of Edmonton. The area of South-Central and Southern Alberta was under the jurisdiction of the district with headquarters in Calgary, with its own administrative organization. Each district has an independent administration that is responsible for all activity within the district. Each unit within the district has a commanding officer responsible for all activity within the unit. The officers at each of these levels were contacted and their permission was obtained to proceed with the study. In addition, each of the officers coordinating the DARE program in the units was contacted, and they were made aware of the study. Their cooperation was requested and received to facilitate timeline coordination and in the designation of potential program and comparison schools.

School Jurisdictions

The superintendent of each of the jurisdictions was contacted to ask for permission to the approach the individual responsible for research requests. After meeting with the researcher and discussing the parameters of the study the four jurisdictions expressed interest in participating. Consent from the jurisdictions enabled the researcher to approach the principals of the schools to request their school's

participation. Following approval from the principal classroom teachers were then approached to schedule data collection within their classrooms.

At the time of the data collection (October 1998 to September 2000) the jurisdictions participating in this study followed two organizational models for their schools. In the middle school model, followed in one jurisdiction, the DARE program was provided in grade five, as this was the upper elementary grade. In the junior high school model, followed in other jurisdictions, the DARE program was provided in grade six, as this was the upper elementary grade. Therefore within the program and comparison groups the students were from grade five and grade six classrooms and a statistical analysis was completed to ascertain that there was no mean age difference between the groups.

Participants.

The participants of the study were students, 9 to 13 years of age, from four non-metropolitan school districts in the province of Alberta. The program group was comprised of 24 classrooms of students who were enrolled in the 17-week Drug Abuse Resistance Education (DARE) program administered by specially trained DARE officers of the Royal Canadian Mounted Police (RCMP). Program participants were located in 13 schools with an average of 16 participants per classroom. Some schools had offered a DARE program for several years, while others were offering the DARE program for the first time.

Participants receiving the DARE program were compared to a comparison group recruited from seven schools in the same districts. An average of 13 students were drawn from 20 classrooms within seven schools. None of the schools supplying the comparison

group offered a DARE program. As a further safeguard against cross-contamination, any students who had previously participated in a DARE program were excluded.

Participants in the study came from 44 classrooms in 20 schools from four jurisdictions in the north–central Alberta area with a mean of 15 participants per classroom. Participants from rural and urban schools were included, as well as some from inner-city settings. The participants ranged from 9 to 13 years old (mean age = 10.61 in DARE programs / 10.75 no program). There were no significant differences in gender ratio noted between the program group (51 percent males) and the comparison (44.6 percent males) group. The demographics of the DARE participants were: 85 % White, 6.4 % Aboriginal, 6.1 % Asian, 3.5 % other. The demographics of the non-DARE participants were: 85.9 % White, 7.1 % Aboriginal, 3.8 % Asian, 4.2 % other. As reported by their teachers, participants were from all three described brackets of social economic status (SES) with the majority being described as falling in the middle SES bracket.

Procedures

The parent(s) of the students sampled for the study, were contacted by letter (see Appendix B). The purpose, possible benefits, and risks of the study were explained. A signed consent form (see Appendix B) was obtained for each participant. The parents were informed that they could choose not to have their child participate in the study or to terminate their child's participation in the study at any time, without any consequence to their child's academic program. Parents were also were informed that anonymity and confidentiality would be maintained by the use of identification numbers to allow analysis of the data without the parent's or child's name appearing on any of the

measurement instruments. The children were informed of their right not to participate in the study and to independently withdraw from the study at any time without consequence. The children also signed a consent form (see Appendix B). The University of Alberta research ethics committee approved the procedures of this study.

Data were collected in the classroom and all forms and instruments were read to the participants within their regular classroom setting. The researcher administered all questionnaires and read a cover letter (see Appendix B) informing the participants that the number on the measurement instruments would only be used to match responses between instruments, and that their names would not appear on any completed surveys or publications. Any affirmative answers on the demographic items regarding possible previous history of physical or sexual abuse (e.g., #12: I have had a problem with bad touching—yes/no (circle one); #13: I have had a problem with bad hurting—yes/no (circle one) on the student demographic form; see Appendix D) were confidentially brought to the attention of the school principal, unless previously advised by the principal to follow other procedures (e.g., bring this to the attention of the school counsellor). Alberta Law and the Companion Manual to the Canadian Code of Ethics for Psychologists (1991) mandate that any disclosure of physical or sexual abuse by a minor must be reported. In this study, any disclosure was brought to the attention of the principal or designated counsellor.

Timeline for the Research

The following table summarizes the scope and sequence of the study.

Group	Pre-Test	Program	Post-Test 1	Time	Post-Test 2
Program	Student demographic form Self-report survey	DARE program (17 weeks)	Student demographic form Self-report survey	6 mo. after Post-Test 1	Student demographic form Self-report survey School demographic form
Comparison	Student demographic form Self-report survey	no program (17 weeks)	Student demographic form Self-report survey	6 mo. after Post-Test 1	Student demographic form Self-report survey School demographic form
Phase I	Phase II		Phase III		Phase IV

Table 3. Schematic Representation of the Research Design.

The study involved five phases, four of which are shown in Table 2.:

- **Phase I**: Data collection sites for the research project were established. Identification and development of the instruments occurred. The program and comparison groups were identified from the list of schools that received, or were on the waiting list to receive, the DARE program. School principals viewed a complete copy of the research proposal prior to an in-person interview with the researcher. When a principal agreed to the school's participation, consent forms were provided to the school, and were sent to parents of children in the program and comparison groups.
- **Phase II**: Prior to initiation of the DARE program, a pre-test was completed using the instruments described in the Pre-Test column of Table 2.
- **Phase III**: After 17 weeks of the DARE program (program) or 17 weeks of regular programming (comparison), the first post-test was completed using the instruments described in the first Post-Test column of Table 2.

- **Phase IV**: Six months after the completion of the DARE program, a second post-test was completed using the instruments described in the second Post-Test column of Table 2.
- **Phase V** Data Analysis: The coding and entry of the data into FileMaker Pro was performed to prepare the data for statistical analysis using SPSS (version 10.0) for Macintosh. T tests and analyses of variance (ANOVA) were performed to ascertain any pre-existing differences between the program and comparison groups. Statistical analysis of the group data using a repeated measures format identified any differences in the dependent variables between the program and the comparison groups. Each case had an anonymous individual identification number for matching of pre- and post-test, and was individually coded for use in assessing the effect, if any, of the null hypotheses.

Materials and Instruments

The variables associated with each dimension of the MIMSEUICA that were found by Pagliaro and Pagliaro to be strongly related to abusable psychotropic use (those with an asterisk in Appendix A) were measured by various specially designed measurement instruments, the instrument adapted from Harmon (1993) and the instrument designed for this study to access the demographic information not captured in the questionnaire (see Appendices D and E). Also included in the demographic instrument were other variables of interest including: (a) the grade level achievement in mathematics and reading as assessed by the classroom teacher; (b) socioeconomic status (SES); (c) presence of emotional and/or behaviour disorders as assessed by the classroom teacher; (d) gender; and (e) gang activity (see Appendix E).

The pre/post-test survey instrument was adapted from an instrument developed by Harmon. This instrument was used in an outcome evaluation of the DARE program and consisted of 10 scales and four sets of individual questions. The 10 scales used in the study were: (a) belief in pro-social norms; (b) social integration; (c) commitment to school; (d) rebellious behaviour; (e) peer drug modeling; (f) attitudes against abusable psychotropic use; (g) attachment to school; (h) self-esteem; (i) assertiveness; and (j) positive peer modeling. The individual variables included questions on attitudes about police, coping strategies, and use of abusable psychotropics in the last year and last month. These 10 scales and four sets of individual questions were aligned to the dimensions of the Mega Interactive Model of Substance Exposure and Use among Infants, Children and Adolescents that Pagliaro and Pagliaro found to be strongly related to abusable psychotropic use (see Appendix E).

The 13 factors, identified by the authors using the MIMSEUICA (Pagliaro & Pagliaro, 1996), were: Genetic Predisposition; Depression; Personality Disorders; Risk-Taking Behaviour; Economic Status (e.g., poverty); Gang Membership; Peer Pressure; Physical Abuse; Sexual Abuse; Culture; Social Mores; Availability; and Pharmacology.

A comparison of the program and comparison groups on the MIMSEUICA factors was of importance as the sample in this study was one of convenience, and random assignment to the program and comparison conditions was not possible. A series of Pearson chi-square analyses were used to compare the MIMSEUICA factors for the program and comparison groups for the complete data set. Tables 4 and 5 report the findings of this comparison between the program and comparison groups on all factors

other than Pharmacology, Availability, and Gang Membership in the complete data set column.

The values for analysis for the 13 factors were derived from the following sources (Appendix C for survey forms and Appendix D for the demographic forms):

- **Genetic Predisposition** (e.g., family history of alcoholism) from the student demographic form question #11 & #12
- **Depression** from the school demographic instrument question #5
- **Personality Disorders** (e.g., antisocial personality) from the school demographic instrument question # 4
- **Risk-Taking Behaviour** from the pre/post-test survey form section on rebellious behaviour
- **Economic Status** (e.g., poverty) from the school demographic instrument question #3
- **Gang Membership** from the school demographic instrument question #10/11 and student demographic form question #5/6
- **Peer Pressure** from the pre/post-test survey form sections on Assertiveness, Self-Esteem
- **Physical Abuse** from the student demographic form question #10
- **Sexual Abuse** from the student demographic form question #9
- **Culture** from the pre/post-test survey form section on Social Integration
- **Social Mores** from the pre/post-test survey form sections on Beliefs, Commitment to School, Attachment to School, Positive Peer Modeling

- **Availability** from the school demographic instrument question #8 and information from the Royal Canadian Mounted Police

The **Pharmacology** factor was not considered, as it had a specific biochemical action and the groups would not be expected to vary in regard to their biological processing of the abusable psychotropics studied. The analysis of the two factors, Availability and Gang Membership, was found to be invalid, as the reports of the presence of these factors was less than five cases per cell, which violates an assumption of the analysis (i.e., lack of sufficient "n"). As the incidence of these two factors in this population was found to be almost negligible, it was not considered to be a factor on which the program and comparison data sets differed.

The reliability of the scales for this instrument was determined by Harmon using Cronbach's alpha. A table from Harmon indicates the number of items in each scale and the corresponding reliability coefficient (see Table 9, Appendix B).

Chapter 4: Results

Data Analysis

Statistical analysis procedures were performed to examine the differences between the program and comparison groups (see Appendix F) both for the dependent variables and to verify that the program and comparison groups did not differ from each other at pre-test on the MIMSEUICA dimensions. Analysis of variance (ANOVA), multivariate analysis of variance (MANOVA), chi-square and t-test procedures were used. Data were coded in the following manner: positive response = 1; negative response = 0; missing datum = 9. For all scales, the items were written so that the responses were in different directions to decrease a positive or negative response bias. The Statistical Package for the Social Sciences - Base 10.0 (SPSS-10.0 for Macintosh) was used for data analysis.

The variables from the model that the developers found to be strongly linked to abusable psychotropic use (those with an asterisk in Appendix A) were used to assign individual cases into categories of low risk and at risk for abusable psychotropic use, for analysis to support or refute Null Hypothesis 3 (There was no significant difference between subgroups, delineated by risk, in the program and comparison populations with regard to attitudes toward or use of abusable psychotropics).

Preliminary Analysis

Although 658 participants were recruited in the initial sample, complete data were obtained from 522. This group consisted of 216 comparison participants and 306 program participants. The retention rate between the comparison group and program group was similar: 78.5 % for the program group had complete data and 80.6% for the comparison

group had complete data, indicating that the attrition rate did not differ although the number differed. A summary of participant description appears in Table 4.

Characteristic	Program Group		Comparison Group	
Participants – incomplete data	390		268	
Participants – complete data	306		216	
Mean age of participants	10.61	sd = 63	10.75	sd = 0.70
Gender of participants	51 % male		44.6 %male	

Table 4. Description of Participants.

To examine whether or not there were significant differences on attitudes toward drug use between those students who participated in the study at all three data collection points and those children who were not located for follow-up testing after the pre-test, an ANOVA was conducted in which testing status (1 = "Incomplete data," 2 = "Complete data") served as the independent variable, and the pre-test 'attitudes toward drug use' measure was used as the independent variable. The results of this analysis yielded a non-significant univariate effect for testing status, $F(1, 658) = 1.28$, $p = .26$, indicating that there were no group differences between those children who participated in the study initially but dropped out of the study by the third data collection time period.

To examine whether or not there were significant differences on reported drug use between those students who participated in the study at all three data points and those who were not located for follow-up testing after the pre-test, an ANOVA was conducted in which testing status (1 = "Incomplete data," 2 = "Complete data") served as the independent variable, and the pre-test 'reported drug use' measure was used as the independent variable. The results of this analysis yielded a non-significant univariate

effect for testing status, $F(1, 658) = 3.67$, $p = .06$, indicating that there were no group differences between those children who participated in the study initially but dropped out of the study by the third data collection time period.

As none of the comparisons between the incomplete (data from participants who completed any surveys) and complete groups (data from participants who completed all three surveys) were found to be significant, the two groups can be assumed to be similar. All further data analysis was undertaken with the data from the group that had completed all three administrations of the survey instrument.

The next step of the data analysis was to determine if the program and comparison groups were similar on the pre-test variables. The MIMSEUICA factors of Genetic Predisposition (alcohol-related), Genetic Predisposition (drug-related), Depression, Personality Disorders, Risk-Taking Behaviour, Economic Status, Peer Pressure, Physical Abuse, Sexual Abuse, Culture, and Social Mores were compared using a series of Pearson chi-square analyses (see Tables 5 and 6). The data for these comparisons were drawn from the student demographic form (Genetic Predisposition [alcohol-related] #11, Genetic Predisposition [drug-related] #12, Physical Abuse #10, Sexual Abuse #9), the teacher demographic form (Depression #5, Personality Disorders #4, Economic Status #3) and from more than one source (Risk-Taking Behaviour [teacher demographic #4 and survey instrument items for Rebellious Behaviour]; Peer Pressure [survey instrument items for Peer Drug Modeling, Assertiveness, and Self Esteem]; Social Mores [survey instrument items for Beliefs, Commitment to School, Attachment to School, Positive Peer Modeling]; Culture [survey instrument items for Social Integration]).

Gang Membership and Availability (of Drugs) were considered invalid factors for comparison, as there were fewer than five cases per cell, a condition that violates a premise (i.e., that each cell in a comparison must have five or more representatives to allow interpretation of the analysis) of the statistical procedure. The Pharmacology factor was not considered, as it has a specific biochemical action that may differ based on for example, gender, race, age, and so forth; however, the two groups did not differ significantly on any of these factors, and would not vary on their biological processing of the abusable psychotropics studied.

Dichotomously coded factors (i.e., participant rated 'yes' if the factor applied to them and 'no' if the factor did not apply to them: Risk-Taking Behaviour, Peer Pressure, Physical Abuse, Sexual Abuse, Culture; teacher rated: Personality Disorder, Depression) were examined using multiple chi-squared analysis. The results of this analysis yielded a non-significant difference between the two groups (see Tables 5 and 6). To examine whether or not there were significant differences between program and comparison students regarding genetic predisposition to alcohol and drugs (Likert scored variables i.e. 0 = does not apply, 1 = does apply), two ANOVAs were conducted. The results of these analyses yielded a non-significant univariate effect for genetic predisposition for alcohol, $F(1, 455) = .22$, $p = .80$, indicating that there were no differences between comparison and program groups. A significant univariate effect for predisposition for drugs, $F(1, 455) = 3.79$, $p = .02$, indicating that program participants were significantly higher than comparison at pre-test. A significant univariate effect for social mores, $F(1, 455) = 2.55$, $p = .01$, indicating that comparison participants social more scores were significantly higher than program at pre-test. Thus, in all subsequent analyses,

predisposition for drugs and social mores pre-test scores were covaried. A summary of the analyses appears in Tables 5 and 6.

Factors	Chi-Square	p Value	% Yes Prog./Comp.
Risk-Taking Behaviour	.67	.41	6.9/ 5.0
Peer Pressure	.55	.46	N/A
Physical Abuse	.17	.68	2.6/ 3.3
Sexual Abuse	.15	.70	2.7/ 3.3
Culture	.57	.44	N/A

Table 5. Pearson Chi-Square Analysis Comparing Participant Report Program and Comparison Group Means for the MIMSEUICA Factors.

Factors	Chi-Square	p Value	% Yes Prog./Comp.
Depression	.88	.35	8.6/ 6.2
Personality Disorders	.95	.33	11.1/ 8.4

Table 6. Pearson Chi-Square Analysis Comparing Teacher Report Program and Comparison Group Means for the MIMSEUICA Factors.

When analyzing the data for socioeconomic status (SES) as reported by the classroom teachers, the following percentages were noted. Participants reported to be living in the lower SES category were those in poverty (program 2.5%/ comparison 0.5%) and those in working class (program 32.2%/ comparison 22.7%). Participants reported to be living in the middle class were program 60.1% (comparison 70.4%) and upper-class were program 5.3% (comparison 6.5%). To examine whether or not there were significant differences between program and comparison children, an ANOVA was conducted in which SES level served as the dependent variable, and group status was used as the independent variable. The results of this analysis yielded a non-significant

univariate effect for SES status, $F(1, 455) = 54$, $p = .47$, indicating that there were no group differences between comparison and program groups.

Analysis of the Effect of the DARE Program

The following research questions were evaluated using the statistical procedures outlined below. Each of the research questions was considered separately with regard to the data analysis procedures undertaken and the resultant findings.

Objective 1: To determine if there is any effect on self-reported **attitudes** toward the use of abusable psychotropics targeted by the DARE curriculum (i.e., alcohol, tobacco, and marijuana).

To approach this question, the entered, cleaned and compiled data were evaluated using the combined scores of two subscales: Peer Drug Modeling scale and Belief in Pro-social Norms scale (Harmon). According to Harmon the scales each have good internal consistency, with a Cronbach alpha coefficient reported of .76 for Belief in Pro-social Norms and .77 for Peer Drug Modeling. In the current study, the subscales were combined and the Cronbach alpha coefficient was .67. A mean score for the participant's answers on subscales were calculated (higher score = more positive attitude toward the use of drugs) at three time points (see Table 7 for a summary of mean scores for program and comparison groups).

Group	Time 1	Time 2	Time 3
Program	.058	.064	.094
Comparison	.040	.068	.080

Table 7. Summary of Mean Scores for Program and Comparison Groups on Self-Reported Attitudes Toward the Use of Abusable Psychotropics.

Repeated measures ANOVA was utilized to examine the effectiveness of the DARE program in reducing positive attitudes towards drugs using the Statistical Package for the Social Sciences (SPSS; version 10.0) for Macintosh. The independent variable was group (1 = students who received the DARE program; 2 = students who did not receive the DARE program) and the dependent variable was the student mean score for attitudes toward drugs at Time 1 (before the program was implemented), Time 2 (immediately after the program was completed), and Time 3 (six months after the completion of the program). Genetic predisposition for Drug use and Social Mores pre-test scores were covaried because of group differences at pre-test. There was a non-significant effect for time [Wilks' Lambda = .99, $F(2, 484) = 2.11$, $p = .12$, multivariate partial eta squared = .01] indicating that the program did not influence student attitudes toward drug use. The graphic representation of the results (Fig. 3) indicates the estimated marginal means of the program and the comparison.

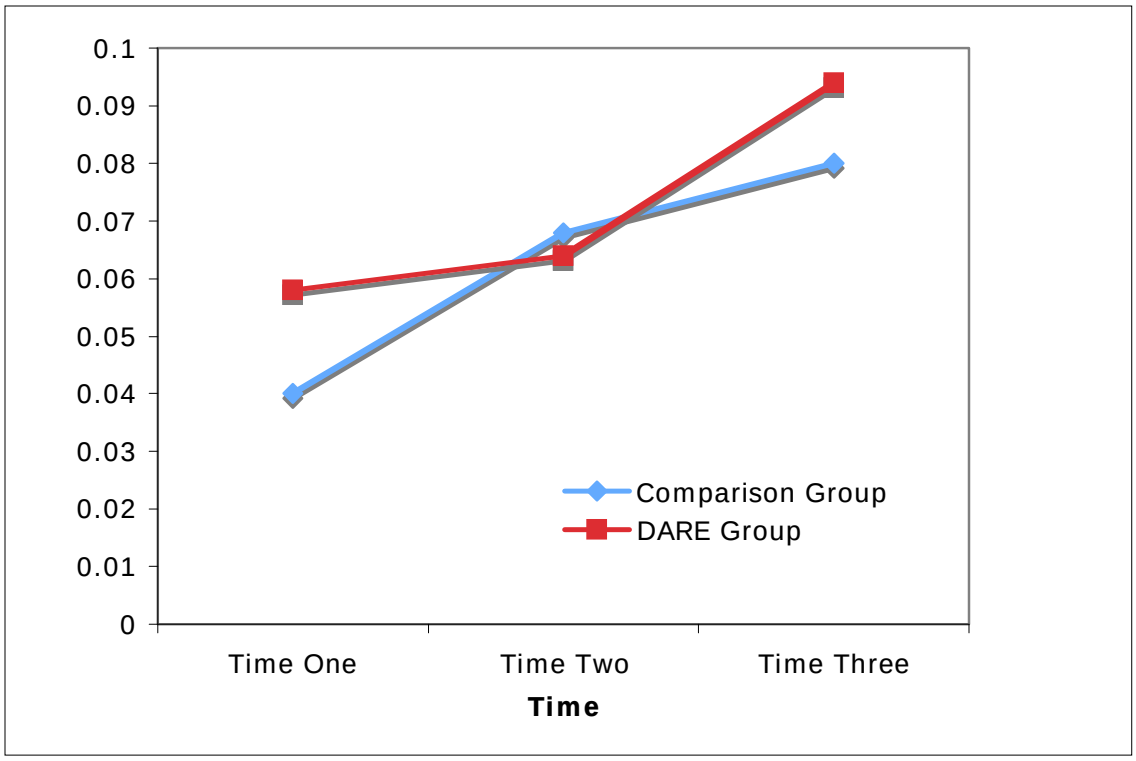

Figure 3. DARE Program and Comparison Group Self-Reported Attitudes Toward Drug Use over Time. Mean scores at Time 1, 2, and 3 are reported.

Objective 2: To determine if there is any effect on self-reported **use** of the abusable psychotropics targeted by the Drug Abuse Resistance Education curriculum (i.e., alcohol, tobacco, and marijuana).

The Reported Use of Abusable Psychotropics (Harmon) was used to examine students' reported use of drugs. This scale is composed of seven items, which were expanded to ten items that include substances targeted by the DARE program to be popular abusable psychotropics within the local area (e.g., Ritalin and Talwin, smokeless tobacco). A mean score for the participant's answers on subscales were calculated (higher score = more reported use of drugs) at three time points (see Table 8 for a summary of mean scores for program and comparison groups).

Group	Time 1	Time 2	Time 3
Program	.080	.075	.097
Comparison	.094	.078	.092

Table 8. Summary of Mean Scores for Program and Comparison Groups on Self-Reported Use of Abusable Psychotropics.

Repeated measures ANOVA was utilized to examine the effectiveness of the DARE program in reducing reported use of drugs using SPSS. The independent variable was group (1 = students who received the DARE program; 2 = students who did not receive the DARE program) and the dependent variable was the student mean score for reported drugs use at Time 1 (before the program was implemented), Time 2 (immediately after the program was completed), and Time 3 (six months after the completion of the program). Genetic predisposition for Drug use and Social Mores pre-test scores were co-varied because of group differences at pre-test. There was a non-significant effect for time [Wilks' Lambda = .99, $F(2, 481)=1.00$, $p = .37$, multivariate partial eta squared = .004] indicating that the program did not influence student reported drug use.

The graphic representation of the results (Fig. 4) indicates the estimated marginal means of the program and the comparison.

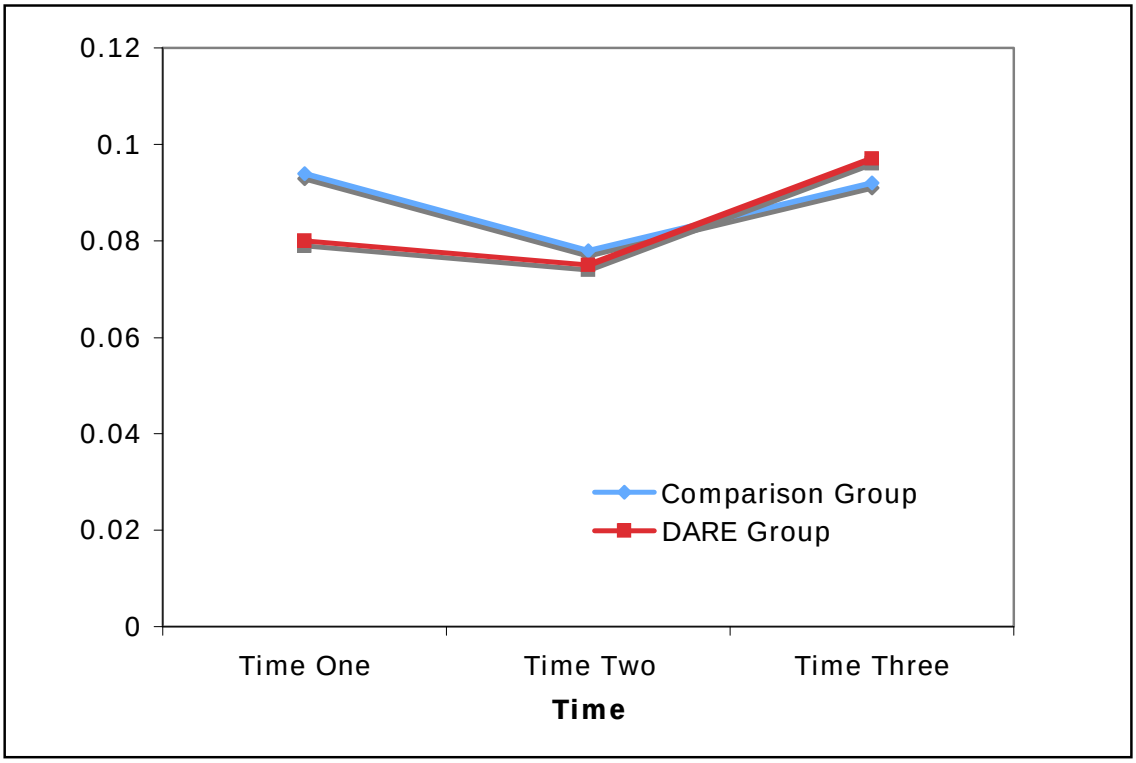

Figure 4. Self-Reported Use of Abusable Psychotropics With Genetic Predisposition and Social Mores Differences at Pre-Test Controlled.

Objective 3: To determine if there are different outcomes in attitudes and use of the abusable psychotropics targeted by the Drug Abuse Resistance Education curriculum (i.e., alcohol, tobacco, and marijuana) for **subgroups** of the target population.

Attitudes Toward Abusable Psychotropic Use

Analysis of the data was conducted using the Beliefs and Peer Drug Modeling scales from the instrument in the Harmon (1993) study composed of 20 items related to the participant's belief about the use of abusable psychotropics and their report of their peer's drug-related behaviour. To examine differences in response to the program between low-risk and at-risk participants, participants were divided into low-risk and at-risk groups. This was achieved by inspecting the sample mean score on the MIMSEUICA (M = .12, SD = .09). At-risk scores were those that were one standard deviation above the

mean on the MIMSEUICA scale (n = 76) and low- or no-risk students were less than one standard deviation above the mean (n= 443).

Repeated measures 2 x 2 x 3 ANOVA was utilized to examine the effectiveness of the DARE program in reducing reported attitudes toward drug use for low-risk and at-risk students in the program and comparison groups. The independent variables were group (1 = students who received the DARE program; 2 = students who did not receive the DARE program) and risk (1 = low risk; 2 = at risk) and the dependent variable was the student mean score for reported attitudes toward drug use at Time 1 (before the program was implemented), Time 2 (immediately after the program was completed), and Time 3 (six months after the completion of the program). Genetic predisposition for Drug use and Social Mores pre-test scores were covaried because of group differences at pre-test. There was a significant effect for time (Wilks' Lambda = .94, p = .001, multivariate partial eta squared = .062) indicating all students' attitudes changed over the three measurement points. Inspection of the means at each time point indicated that all students reported more positive attitude toward drug use over time. There was also a significant effect main effect for risk status, F(1, 518) = 51.75, p = .001, eta squared = .09), indicating that children at high risk had more positive attitudes to drug use than children at low or no risk. There were no main effects for group status (i.e., program or comparison) and no interaction effects.

Self-reported Use of the Abusable Psychotropics

Analysis of the data was conducted using the Reported Use scale from the instrument in the Harmon (1993) study composed of ten items to capture other drug use

as well as the substances targeted by the Drug Abuse Resistance Education program. The high and low-risk groups were used as noted above.

Repeated measures 2 x 2 x 3 ANOVA was utilized to examine the effectiveness of the DARE program in reducing self reported drug use for low-risk and at-risk students in the program and comparison groups. The independent variables were group (1 = students who received the DARE program; 2 = students who did not receive the DARE program) and risk (1 = low risk; 2 = at risk), and the dependent variable was the student mean score for self reported drug use at Time 1 (before the program was implemented), Time 2 (immediately after the program was completed), and Time 3 (six months after the completion of the program). Genetic predisposition for Drug use and Social Mores pre-test scores were covaried because of group differences at pre-test. There was a significant effect for time (Wilks' Lambda = .97, p = .001, multivariate partial eta squared = .028) indicating that all the students' use had changed over the three measurement points. Inspection of the means at each time point indicated that all students reported more drug use at Time 1, with a decrease at Time 2 and a return to their former level of use at Time 3. There was also a significant effect main effect for risk status, $F(1, 515) = 31.51$, p = .000, eta squared = .06) indicating that children at high risk had more self-reported drug use than children at low or no risk. There were no main effects for group status (i.e., program or comparison) and no interaction effects.

To examine which of the predisposing characteristics of the participants predicted reported drug use, a regression was conducted using self-reported drug use and predisposition for drug use, social mores, and risk status were entered as the predictors. Results from this analysis revealed a significant model ($F(4,486)$ 9.52, $p < .001$) with

social mores as the only significant beta value (beta = 0.224, $p < .001$) indicating that above and beyond risk status social mores, or the pro-social attitudes that children report having, are the most predictive of drug use.

Chapter 5: Discussion

The purpose of this study was to evaluate the stated student outcomes of the Drug Abuse Resistance Education (DARE) program including decreases in positive attitudes toward the use of abusable psychotropics and decreases in the self-reported use of the abusable psychotropics for upper-elementary student participants in north–central Alberta in the late 1990s. These variables were also investigated when stratified by risk as measured by the MIMSEUICA (Pagliaro & Pagliaro, 1996). The findings of this study as reported in Chapter 4 are discussed with regard to each of the null hypotheses (p. 37), and placed into the context of the present state of research into the efficacy of the DARE program.

The data were compared for the incomplete and complete data sets on the variables of attitudes to abusable psychotropic use and self-reported abusable psychotropic use. As no significant differences were found between the incomplete data set (data from all participants who completed any of the surveys), and the complete data set (data from participants who completed all surveys), a decision was made to use the complete data set. This decision was made as the complete data set was not significantly different from the incomplete data set (missing data were random in distribution) and the complete data set had more points per participant, increasing representation of the sample.

The initial challenge of this study was the use of a sample of convenience for the data collection. Addressing this challenge necessitated comparing the program and comparison groups to assure they did not differ substantially on any of the 13 factors significant to decisions that children and adolescents make with regard to the abusable

psychotropics as set out in the MIMSEUICA (Pagliaro & Pagliaro, 1996). The groups were also compared on the basis of age, gender, birth order, and ethnicity. Regarding these variables, no significant differences were found between the program and comparison groups.

Differences at pre-test were found for Genetic Predisposition for drug (but not alcohol) use and Social Mores. Any differential effect from these factors was controlled when looking for an effect of the DARE program on the dependent variables of attitudes and use and for the variables when stratified by risk.

Null Hypothesis 1 ACCEPTED: There is no significant difference in attitude toward abusable psychotropic use between a cohort of students who have participated in the DARE program and a cohort who have not participated in the DARE program.

An analysis of a data set (including the items from both the Belief and the Peer Drug Modeling scales) produced a robust data set and analysis of these data found no significant difference between the program and the comparison group data. The inclusion of both scales in the analysis increased the factor loading on attitude toward abusable psychotropic use over the loading of either of the scales individually, thus increasing the reliability and validity of the measurement. Each of the questions individually added to the increased loading, and none were found to be neutral or to detract from the factor loading. This increase in robustness of the data and the related increase in reliability and validity over separate consideration of the scales supported the use of both the Belief and the Peer Drug Modeling scale for this analysis.

When comparing the marginal means of the program and comparison groups for their self-reported attitudes toward use of the abusable psychotropics (Fig. 3), statistically

and visually there is no significant difference in program and comparison at either Time 1 (pre-test) or Time 3 (post-test 2). However, both program and comparison group show an increase between the marginal means at Time 1 (pre-test) and Time 3 (post-test). In contrast, when comparing the marginal means of the program and comparison groups at Time 2 (post-test 1), although a visual difference and a reversal of the means was suggested between the program and the comparison group (Fig. 3), no statistically significant difference was noted. Given these findings, there was no significant effect of the DARE program with regard to a change in self-reported attitudes toward use of the abusable psychotropics. Any decrease in the marginal means would represent a lower endorsement of positive attitudes toward use of the abusable psychotropics. As there was no significant decrease in the positive attitudes of the program participants toward use of abusable psychotropics, this represented no change in their endorsement of the items or in attitude due to their participation in the DARE program.

As differences at pre-test between the program and comparison groups were controlled, their self-reported attitudes toward use of the abusable psychotropics (as represented by responses to the items from the Belief and the Peer Drug Modeling scales), there was no effect on the program groups' attitudes toward use of the abusable psychotropics through their exposure to the 17-week DARE program. Even the visually suggested but non-significant effect at Time 2 was not sustained six months later at the time of the second post-test (Time 3) when the means for the program and the comparison groups were not statistically or even visually different from the pattern noted at Time 1. The provision of the 17-week DARE program did not have a statistically significant effect on the participants' attitudes toward use of the abusable psychotropics,

and even the slight but non-significant effect was lost over the six-month period after completion of the program. In consequence, Null Hypothesis 1 was accepted.

Null Hypothesis 2 ACCEPTED: There is no significant difference in self-reported use of abusable psychotropics between a cohort of students who have participated in the DARE program and a cohort who have not participated in the DARE program.

This hypothesis was tested by analysis of the pooled data on the abusable psychotropics specifically addressed in the DARE program (alcohol, marijuana, smokeless tobacco, and tobacco). Information on the individual abusable psychotropics was collapsed because the number of data points for the individual abusable psychotropics was too small to allow for statistical interpretation, as the number in the cells needed to be greater than five items to allow for analyses. Endorsement of the use of marijuana and smokeless tobacco was effectively zero, and use of alcohol and tobacco comprised the majority of the endorsed items of self-reported abusable psychotropic use. Data were pooled to combine use in the last month with use in the last year, as the number of data points was limited and use in the last month would be subsumed under use in the last year.

No statistically significant differences were found between the marginal means of the program and comparison groups when they were compared at Times 1, 2, and 3. Each of the marginal means for the comparison group was larger than the corresponding marginal mean for the program group, although this difference was not statistically significant. The slight decrease in the comparison group marginal means between Time 1 (pre-test) and Time 2 (post-test 1) paralleled the slope of the program group over this

time period. This observation could be explained by the process of being observed or "studied"; that is, a possible Hawthorne effect phenomenon (Gray, 2002) and not an effect of the intervention as both the program and comparison group means were found to be similar at these times. Another possible explanation of this difference was that the difference was within the variation expected for the measurements and not a true variation; that is, the difference would be attributed to measurement error.

Null Hypothesis 2 was accepted. This indicated that as measured by this study the DARE program had no significant short-term or long-term effect on the self-reported use of abusable psychotropics for this population. This finding should not be surprising as the extant literature supports little effect of the DARE program on this variable and questions the appropriateness of the expectation of an effect on this variable from a one time, 17-week program delivered to this population (Birkeland, Murphy-Graham and Weiss, 2005).

Null Hypothesis 3 ACCEPTED: There is no significant difference between subgroups, delineated by risk, in the program and comparison populations with regard to knowledge of, attitude toward, or use of abusable psychotropics.

Factors of the MIMSEUICA (Pagliaro & Pagliaro, 1996) to assess risk for abusable psychotropic involvement delineated two subgroups: 1) low risk and 2) at risk. Using these two levels of risk as a further discriminator, data were analyzed using the variables (attitude toward abusable psychotropic use, and self-reported use of abusable psychotropics) by program and comparison group, by three time points.

Although Null Hypothesis 1 was accepted, further investigation of the data was undertaken to provide information regarding the distribution of this variable. The purpose

of the analysis was to ascertain whether the distribution of the variable was homogenous or if risk had a differential effect on attitude toward abusable psychotropic use for this population. The pattern noted for the program and the comparison group in Fig. 3 was consistent with the results for both the program and comparison group, but differed between the low-risk and at-risk subgroups.

When analyzing the data from the low-risk subgroup, the comparison and program groups followed a similar trajectory. Within the low-risk group, having a very low incidence of positive attitudes toward abusable psychotropic use, the effect of the DARE program was not significant. A long-term effect of the DARE program on the attitudes toward use of the abusable psychotropics within this low-risk program group was not supported.

On analysis of the data from the at-risk subgroups, the comparison and program groups again followed a similar curve over the three time points plotted. The program and comparison group status had no measurable difference over time. A significant difference was noted between the low-risk and at-risk subgroups of the comparison and program groups indicating that risk status at pre-test determined more of the variation in attitude toward abusable psychotropic use than participation in the 17-week DARE program for this population. The question of fiscal responsibility was raised, as the supposed cost benefit of the DARE program was not supported by this study. This “cost benefit” discussion appeared in the literature (Birkeland et al., 2005) and was reported to be important to the decisions that the various jurisdictions made with regard to continuation of the DARE program.

Even though Null Hypothesis 2 was accepted, further data analysis was completed to delineate if distribution for this variable was homogenous, or if risk had a differential effect on self-reported abusable psychotropic use for this population. Although Fig. 4 suggested a decrease at Time 2 for both program and comparison groups, there was no statistically significant difference found between program and comparison groups at any of the times reported.

The estimated marginal means for the low-risk subgroup were in the range of 0.0 to less than 0.3. In comparison, the marginal means of the at-risk subgroup were in the range of 0.6 to 1.2. Given that the ranges of these groups delineated by risk did not overlap, being low risk or at risk as delineated by the factors from the MIMSEUICA was considered to be a differentiating factor for the population, while exposure to program had no statistically significant effect. Risk, as delineated by the MIMSEUICA factors alone, was a stronger indicator of self-reported abusable psychotropic use independent of program status for this population.

Another interesting finding was that the slopes of the graphs for self-reported use of the abusable psychotropics were parallel for the low-risk and at-risk subgroups independent of program status. The at-risk subgroup's marginal means decreased for program and comparison between Times 1 and 2, while the low-risk subgroup's marginal means increased for both program and comparison during this phase of the research. A very slight increase was found between Time 2 to Time 3 for both the low-risk and the at-risk subgroups of the program and comparison groups. As found previously, risk status as delineated by the MIMSEUICA predicted self-reported use of the abusable psychotropics, and no effect was found for the DARE program.

Given that the variable of self-reported use of abusable psychotropics did not differentiate between program and comparison groups (Fig. 4), and that the program and comparison groups parallel each other when delineated by risk (low risk and at risk), there was no effect of the DARE program on the self-reported use of abusable psychotropics for this population. However, both program and comparison group graphs were similar when delineated by risk for use of abusable psychotropics; for example, low-risk program and comparison groups and at-risk program and comparison groups. The differences between low-risk and at-risk groups (as defined for this study) were greater than any difference between program and comparison groups, suggesting the trends noted were dependant on risk for use of abusable psychotropics rather than an effect of the DARE program.

The DARE program, therefore, had no differential effect on this population related to risk for use of abusable psychotropics. Given that DARE education is a primary prevention program meant to address issues prior to the initiation of abusable psychotropic use, a recommendation would be to initiate the DARE program at an earlier age (for example, at the early levels of the kindergarten to grade 12 curriculum), before experimentation with abusable psychotropics was initiated, or to use an alternate program designed for “initiated” members of this population.

Another interesting and unexpected finding of this study was the effect of Social Mores (the participants endorsement of commonly accepted societal views and norms) on the participant’s responses. Given the statistical significance and large effect size found for Social Mores on both attitudes to abusable psychotropic use and self-reported abusable psychotropic use, effective programming should focus on increasing

participant's adherence to these commonly espoused pro-social mores. Whether or not the DARE program influenced the pro-social mores of participants cannot be ascertained; however, the program was not designed to directly affect this area.

The effect of Genetic Predisposition for drug use on the participant's responses for attitudes to abusable psychotropic use was statistically significant, although the effect size was smaller than that for Social Mores. There was no statistically significant effect for this factor on self-reported abusable psychotropic use. As this is not a factor that could be influenced by programming, awareness of this factor and its possible implications rather than a programming focus would be recommended.

Limitations and Delimitations

The study was limited by the lack of a randomized sample, although this was explored through the comparison of the applicable demographic and survey items between the program and the comparison groups. The sample is a limitation, as the lack of complete freedom in selecting participants could limit generalization of results. The number of participants could be viewed as a limitation as it was not possible to increase the number and a portion of the school-age population was not sampled, such as students who were absent or early school leavers. Modification of some portions of the measurement instruments were not directly validated which forms a limitation. The study was delimited to Alberta, so findings may not be able to be generalized to other areas of Canada or North America unless the population under consideration was comparable to the studied population at the time the research was conducted.

Chapter 6: Conclusions

The purpose of this study was to evaluate the stated student outcomes of the DARE program including decreases in positive attitudes toward the use of abusable psychotropics and decreases in the self-reported use of the abusable psychotropics for upper-elementary student participants in north–central Alberta in the late 1990s. These variables were also investigated when stratified by risk as measured by 13 factors of the MIMSEUICA (Pagliaro & Pagliaro, 1996). The findings as discussed in Chapter 5 led to the following conclusions.

An overarching conclusion from the findings of this study was that as the DARE program was designed as a primary prevention program, use of this program with a population that may have begun to experiment with abusable psychotropics is not recommended. A primary prevention program is intended for individuals who are naïve to abusable psychotropic use, and given that a significant portion of the grade four to six students reported occasional use of abusable psychotropics the efficacy of a primary prevention program would be compromised. Possibly an earlier introduction of the program, perhaps in upper division one (grade three) using the grade three section of the curriculum, might result in different outcomes. Further research with regard to the effect of the DARE program with a population naïve to experimentation with the abusable psychotropics (for example, grade three students) is suggested as no use was noted for the grade four participants in this study.

With regard to the effect of the DARE program on attitudes toward the abusable psychotropics, null hypothesis 1 was accepted as the findings of this study indicated that there was no statistically significant difference between the program and the comparison

groups with regard to their attitudes toward the abusable psychotropics. A visually suggested, though non-significant difference was noted. This was in the expected direction in that the program group was less positive in their attitudes toward abusable psychotropic use, by themselves and their peers, than the comparison group. Even this non-significant difference was no longer detectable by six months after the completion of the DARE program. Although the DARE program did demonstrate a non-significant effect on the attitudes of the participants toward abusable psychotropic use, even this was lost over time. This, in combination with the lack of demonstrable effect on self-reported use of abusable psychotropics, can be seen as further diminishment of the return on the investment of providing this program when only these parameters are considered.

When Null Hypothesis 2, the effect of the DARE program on self-reported abusable psychotropic use, was considered within the context of the data analyses completed for this study, the null hypothesis was accepted since there was no statistically significant difference in the self-reported abusable psychotropic use of the program and the comparison groups. Most of the reviewed literature supported the conclusion that the DARE program had little demonstrable effect on self-reported abusable psychotropic use for this population. Recent articles and reviews in the literature questioned the plausibility that a 17-week program offered to grade five and six students one hour per week could be expected to eradicate or even substantially impact the complex, multidimensional problem of abusable psychotropic use among youth. Whether or not this expectation would be considered reasonable, the findings of this study do not support the continued provision of the DARE program as an effective deterrent to upper

elementary youth who may or may not already have experienced using abusable psychotropics.

When these variables and null hypotheses were re-examined as separated by risk (delineated by the factors of the MIMSEUICA), no sustained effect of the provision of the DARE program was found. In the case of attitude toward the use of abusable psychotropics, the division into low-risk and at-risk groups indicated that within the low-risk group, no effect of the DARE program was measurable. When considering the at-risk subgroup of the program group, the attitudes toward the use of abusable psychotropics indicated no effect of the DARE program. The participants risk status had a stronger correlation to their attitudes toward abusable psychotropic use than did provision of the DARE program for this population.

When considering self-reported use of the abusable psychotropics in program and comparison participants separated into low-risk and at-risk groups, no significant effect of the DARE program was noted. Given that program and comparison group graphs were parallel to each other when separated by risk as delineated by the factors of MIMSEUICA, the difference within the population, differentiated on the factor of risk, was statistically significant, while the difference between the program and comparison groups was not significant. Therefore, self-reported use of the abusable psychotropics was dependant on risk as assessed by the factors of the MIMSEUICA, rather than an effect of the DARE program in this study.

Overall, the DARE program appeared to have no significant, long-term effect on the variables assessed in this study. The question of which outcomes would be considered appropriate to assess a program such as DARE education has been raised in the recent

literature (Curtis, 1999; Donnermeyer, 2000; Fisher, 2000; Birkeland et al., 2005). While this consideration would appear to have merit, it is outside of the scope of the present study and would be recommended for further research. Whether it is reasonable to expect a one-hour per 17-week program without reinforcement programming or "booster" sessions to produce a sustained, significant change in the complex, multi-factorial response of students to the abusable psychotropics needs to be considered. Given that all other educational goals and programs require teaching, re-teaching, sustained reinforcement, and additional information that comprises a spiral curriculum, the thought that the DARE program as presently provided could meet this expectation is highly optimistic. Perhaps augmenting the length of the program and/or configuring follow-up sessions may increase the effectiveness of the DARE program with the present population.

In this quantitative study that included a pilot phase, and a pre- and post-test design of the stated student outcomes of the DARE program as provided to upper-elementary students in north–central Alberta in the late 1990s, no significant, lasting effect was found on either the participants' attitudes toward use of the abusable psychotropics, or their self-reported use of the abusable psychotropics. The findings of this study suggest that the continued provision of the original DARE program to an upper elementary age group without substantial revision of content and pedagogical structure will likely have little effect on the participants' attitudes toward abusable psychotropic use and their self-reported use of abusable psychotropics.

Chapter 7: Recommendations

Several recommendations are proposed from the conclusions drawn from the findings of this study. The primary conclusion of this study was that without modification or a different deployment, the continued use of the original DARE program, as provided to grade five and six students, would not change participants' attitudes toward abusable psychotropics, nor diminish the self-reported use of the abusable psychotropics. Although some non-significant effects were noted, sustained effects of the program were not found on the variables investigated in this study. Adjustment of the age group of the participants and significant revision of content and pedagogical practice, as well as use of repeat or "booster" sessions might be recommended.

Given what was discovered in this study, the DARE program, being designed as a primary prevention intervention, must be introduced at a lower grade level than upper elementary. The data collected in this study indicated that a significant percentage of the participants were involved in prior and/or present experimentation with the abusable psychotropics discussed in the DARE program at the initiation of the program. Primary prevention programs are designed for use with a population prior to the introduction of the behaviour that they attempt to discourage. As the participants were not naïve to experimentation with the abusable psychotropics, the efficacy of a primary prevention program is suspect and an earlier entry point to the program, possibly in upper Division 1 (for example, grade 3) would allow dissemination of the program to participants prior to experimentation with the abusable psychotropics. In this case, a primary prevention program would be appropriate, as the participants would fall within the population group the program was designed for originally.

Consideration should be given to advancements in pedagogical theory with regard to active learning and developmentally appropriate curriculum, similar to the skill streaming approach for teaching social skills, when necessary updates to the curriculum are contemplated. As well, the wisdom of providing only one section of a multilevel curriculum intended for students from kindergarten to grade 12 should be reconsidered. For instance, educational programs provide teaching, re-teaching, sustained reinforcement, and additional information that comprises a spiral curriculum, considered by many educators as the "backbone" of pedagogical practice within the schools in the districts that participated in this study. At the very least, periodic reinforcement programming or "booster" sessions would be recommended to enhance any possible effect of the DARE program on the attitudes of participants toward the use of the abusable psychotropics.

When considering risk for use of abusable psychotropics (allowing low-risk and at-risk subcategories to be tested in conjunction with the variables of self-reported attitudes toward and use of the abusable psychotropics), a non-significant effect was noted at first post-test. That effect was not maintained at a second post-test conducted six months later. This again speaks to the absence of a sustained effect of the DARE program. Good pedagogical theory informs educators that sustained change without follow-up instruction should not be expected. It is suggested, therefore, that earlier initiation of the DARE program with developmentally appropriate reviews and further education, such as that found in the rest of the kindergarten to grade 12 programming that is part of the full DARE program, could provide a framework for this programming.

Multiple types and levels of programming are suggested to address the diversity of needs and factors, such as risk, experience, experimentation, and background, that affect the interactions of children and adolescents with the abusable psychotropics available to them. With the continued evolution of the environment that children, adolescents, and young adults find themselves immersed in, the provision of any one shot, static program to address this complex set of issues, especially in the long term, appears to be overly optimistic if not unrealistic.

Another important finding of this study would be the discovery that self-reported use of the abusable psychotropics appeared to be dependant on risk as assessed by the factors of the MIMSEUICA. If a method of assessing risk, possibly using the factors of the MIMSEUICA, could be developed for this population, this would allow targeting of intervention strategies to more specifically address the needs of subgroups within the population. In the same way that "at risk" readers are targeted for specific learning to read strategies, targeting of intervention strategies could help to specifically and appropriately address the needs of these subgroups. In modern education practices streaming of educational programming, based on assessed need or risk, would be considered to be best practice. Needs assessment to identify individuals who may benefit from specific instruction and any necessary intervention, provided within the broader health curriculum, would be strongly recommended.

Another major consideration for the DARE program is the exclusive use of active police officers as the instructors for the program. This was believed to be important to the "connection" between the schools and their local police departments, as expressed to the researcher by an RCMP officer responsible for the DARE program, and by several of the

local district chiefs and officers. A major impediment to the DARE program being offered more widely was the lack of officers who were able to provide their own time to undertake voluntary work in the program, and the added difficulty of working around the officer's shifts. An argument could be made to use the school resource officers who work in many high schools to deliver the program and any follow-up. These officers are trained in community policing and have strong backgrounds in working with young people and in crime prevention. This would use police resources that are already committed to the school jurisdiction and allow for "positive" contact between the local police officers and the students earlier in their school experience, especially if the program was offered to upper Division 1 students. Continuity of programming would also be an option as the officers assigned to the jurisdiction would be familiar with the school population and this would be part of their normal workload as opposed to volunteer work done over and above the officer's normal workload.

Use of a team teaching approach with the officers and the schoolteachers would be another option, as well. This approach would increase the resources available in the program through the teacher's knowledge of the students and the officer's knowledge of their legal and criminal outcomes of substance abuse. The officers would also gain knowledge of the youth in their community, and the teachers would gain up-to-date knowledge of the state of substance abuse issues in their community. In this scenario the students would gain both information about substance abuse and a relationship with their local police officers prior to most involvement in matter of a law enforcement nature.

Due to the importance of the issues around substance abuse in our society and the real and hidden costs of substance abuse, estimated to be in the range of millions of

dollars each year, the importance of intervention programs for abusable psychotropic use with youth cannot be overstated. The societal costs go well beyond crime and the lost productivity related to substance abuse. The loss of quality of life in combination with the costs of health care, incarceration, institutionalization, and rehabilitation for the individuals affected and their families would suggest that effective preventative programming would be strongly supported. While it would be naïve to believe that a single portion of a comprehensive kindergarten to grade 12 programming, such as the DARE program, would be the answer to this multifaceted problem, building on the potential of this program could be part of a coordinated, integrated program incorporated into the standard school curriculum.

An integrated multimodal, multi-factorial approach with provision of multiple programs across the range of primary prevention to tertiary program needs would be considered necessary to support children and adolescents around the issues and challenges of exposure to and use of the various abusable psychotropics. Individual, community, governmental, and societal support and commitment will be necessary to address the immense problem that abusable psychotropic use represents for our north–central Alberta region as represented in this study and well beyond.

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Appendix A: Mega Interactive Model of Substance Exposure and Use in Infants, Children, and Adolescents (MIMSEUICA)

The variables marked with an asterisk (*) are factors that are strongly linked to abusable psychotropic use (Pagliaro & Pagliaro, 1995), and will be evaluated with the demographic and the knowledge, attitude, and use measurement instruments specially designed for this research project. These factors also will be used to randomly assign individual cases into three categories and analyzed in regard to supporting or refuting Null Hypothesis 4.

Infant, Child, or Adolescent Dimension

Physical variables:

* Age

* Gender

* General Health Status (e.g. robust versus frail)

* Genetic Predisposition*(e.g. family history of alcoholism)

* Physical Impairment or Handicap

* Race

Psychological variables:

* Aggressiveness

* Anxiety

* Attitudes

* Boredom

* Cognitive Function

* Depression*

* Developmental Level

* Fears and Phobias

* General Mental Health

* Impulse Control

* Intelligence

* Loneliness

* Personality Disorders* (e.g., antisocial personality)

* Psychological Adjustment

* Religiosity

* Risk-Taking Behaviour*

* Self-esteem

* Sexual Orientation/Preference

* Stress

Social variables:

* Culture

* Death of Parent

* Delinquency

* Divorce of Parents

* Dysfunctional Family

* Economic Status (e.g., poverty)*

* Education

* Employment Status

* Ethnic Background

* Gang Membership*

* Homelessness

* Major Life Events or Lifestyle Changes (e.g., receiving failing grades at school)

* Moral Values

* Parental Attitudes Toward Substance Abuse

* Peer Pressure*

* Physical Abuse*

* Religion

* Sexual Abuse*

* Social Competence

* Social Stability

* Social Support (e.g., family, school, and other social networks)

* Treatment Experiences

Time Dimension

Time variables:

* Historic period (e.g., 1960s versus 1990s)

* Length of Time of Substance Abuse

* Period of User's Life (e.g., childhood versus adolescence)

SOCIETAL DIMENSION

Societal variables:

* Attitudes Toward Pertinent Factors (e.g., ageism, sexism, and substance use)

* Culture*

* Community Structure

* Economy (e.g., availability of jobs)

* Educational Systems

* Health Care System

* "Law of the Land" (e.g., legal age for purchase of alcohol and tobacco)

* Media Influence (e.g., movies, rock videos, and rap songs)

* Professional Ethics

* Realms of Professional Practice

* Religions

* School System

* Social Controls

* Social Mores*

* Social Programs

* Treatment Available (e.g., access and cost)

* Youth Correctional/Detention Facilities

Substance Dimension

Substance variables:

* Abuse Liability

* Addiction Potential

* Availability*

* Amount Used (e.g., individual dose and frequency)

* Cost

* Interactions

* Legal Status

* Method of Use

* Pharmacokinetics

* Pharmacology*

* Toxicology

Pattern of use variables:

* Non-Use

* Initial Use

* Social Use

* Habitual Use

* Abuse

* Compulsive Use

* Resumed Non-Use

* Controlled Use

* Relapsed Use

Appendix B: Consent Forms

Dear parent or guardian:

We want to ask you for your permission for your child to be in a study of drug education in his or her school. Permission for this study was obtained from the school board and your child's school. A survey will be given to all the children in your child's class, who have been given permission by their parent or guardian to participate in this study.

What is involved? Your child will be asked to complete three short surveys about drug and substance abuse. Each survey will take about 30 minutes to complete. The surveys will be completed during class time.

Potential Benefits and Risks. The survey will ask questions about what your child knows and thinks about the drugs covered by the Drug Abuse Resistance Education (D.A.R.E.) program. Your child's answers will be totally anonymous. The results of the full study will be shared with the school board, and this information will help them decide what to teach children about drug and substance abuse.

Participation is voluntary. Your child's participation is voluntary. There is no penalty if you or your child declines participation in this study. Your child can stop his or her participation in the study at any time. Your child can refuse to answer any question on any of the surveys.

Information is confidential. All information will be confidential. Your child's name will not appear on any questionnaires. The information will only be used in this research project. All surveys will be kept in a locked research unit for analysis by the researcher who is a Ph.D. candidate in the Faculty of Education at the University of Alberta.

Questions? Please complete and return the attached consent form as soon as possible. If you have any questions about the study, please call Barbara Uibel, Dr. Louis Pagliaro, or Professor Ann Marie Pagliaro at 492-2856.

Thank you for your consideration of this request and for your anticipated cooperation.

Sincerely,

Barbara Uibel, M.Ed., C. Psych., Ph.D. Candidate
Dept. of Educational Psychology
Faculty of Education
University of Alberta

Louis A. Pagliaro, Ph.D., C. Psych.
Professor
Department of Educational Psychology
Faculty of Education
University of Alberta

Ann Marie Pagliaro, RN, MSN
Professor and Director
Substance Abusology Research Unit
Faculty of Nursing
University of Alberta

Please check (/) the response that you agree with:

__ Yes, my child can be in the study.

__ No, my child cannot be in the study.

__ I want more information. Call me at _____.

_____parent/guardian signature

_____child's name (please print)

_____date

Please send this form back to school with your child in the attached envelope.

Thank you.

Dear student:

We want to ask you to be in a study of drug and substance abuse. Only those children who have their parent's or guardian's permission to be in the study will be asked to participate.

What is involved? You will be asked to answer a list of questions about drug and substance abuse. You will be asked to answer the questions now, in December, and in June. It will take about 30 minutes to answer the questions. You can do it in class.

Potential Benefits and Risks. You will be asked to answer some questions about what you know and think about drugs. Your answers will be put with other children's answers to see what children in general know and think about drugs.

Participation is voluntary. Your participation is voluntary. There is no penalty if you choose not to be in this study. You can stop being in the study at any time. You can refuse to answer any question.

Information is confidential. All of your answers will be kept private. Your name will not be on any of the surveys. Your answers only will be used in this study of drug education in your school. Your answers will be kept at the University of Alberta.

Please check (/) the response you agree with:

__ Yes, I will be in the study.

__ No, I will not be in the study.

_____ please sign your name

_____ please print your name

_____ today's date

Please return this form to the researcher.

Thank you.

Scale Name	Number of Items	Alpha
Social Integration	15	.85
Commitment to School	9	.67
Attachment to School	8	.75
Belief in Pro-Social Norms	15	.76
Rebellious Behaviour	14	.82
Assertiveness	8	.58
Positive Peer Modeling	16	.69
Peer Drug Modeling	8	.77
Self-Esteem	15	.84
Attitudes Against Substance Use	12	.66

(Source: Harmon, 1993)

Table 9. Reliability of Scales.

Reading Level of Consent Form—Parent or Guardian

Flesch Reading Ease	70.18%
Flesch - Kincaid Grade Level	6.72

Reading Level of Consent Form—Participant

Flesch Reading Ease	77.49%
Flesch - Kincaid Grade Level	4.86

Reading Level of Survey Form—Participant

Flesch Reading Ease	91.64%
Flesch - Kincaid Grade Level	3.5

Appendix C: Measurement Instruments for Knowledge, Attitudes, and Use

(Source: Harmon, 1993)

Beliefs

How wrong is it for you or someone your age to do each of the following things?

Cheat on school tests

Use marijuana

Break something that belongs to someone else just to be mean

Steal something worth less than $5

Drink beer or wine

Break into a car or house to steal something

Steal something worth more than $50

Sell drugs to another student

Please tell whether you think each of the following statements is mostly true or mostly false.

T F Sometimes a lie helps to stay out of trouble with the teacher.

T F It is alright to get around the law if you can.

T F It is okay to lie if it keeps your friends out of trouble.

T F Sometimes you have to be a bully to get respect.

T F If you find someone's purse it is OK to keep it.

T F Sometimes you have to cheat in order to win.

Social Integration

Please tell whether you think each of the following statements is mostly true or mostly false.

T	F	I often feel like nobody at school cares about me.
T	F	Teachers don't ask me to help them in class.
T	F	I feel no one really cares what happens to me.
T	F	I often feel lonely at school.
T	F	Sometimes I feel lonely when I'm with my friends.
T	F	I don't feel as if I really belong at school.
T	F	I often feel left out of things.
T	F	Other students don't want to be my friend.
T	F	My friends try to help me if I have a problem.
T	F	I don't feel that I fit in very well with my friends.
T	F	Teachers don't call on me in class, even when I raise my hand.
T	F	My friends don't care about my problems.
T	F	I feel like I belong at this school.
T	F	I feel close to my friends.
T	F	I know people in this school will help me when I need help.

Commitment to School

Do you expect to complete high school?

How important do you think it is to work hard in school?

How hard do you work in school?

How true about you are the following statements?

T F My schoolwork is messy.

T F I don't bother with homework or class assignments.

T F I turn my homework in on time.

T F If a teacher gives a lot of homework, I try to finish all of it.

T F The grades I get in school are important to me.

T F I often feel like quitting school.

Rebellious Behaviour

How often do you do each of the following things?

Take things that do not belong to me.

Stay after school to be punished.

Break other people's things.

Try to hurt or bother people (by tripping, hitting, or throwing things).

Tease other students.

Fight with other students.

Talk back to the teacher.

Show off in class.

Do things I know will make the teacher angry.

Cheat on tests.

Copy someone else's homework.

Come late to class.

Pay attention in class.

Do what the teacher asks me to do.

Peer Drug Modeling

During the last year, how many of your friends have done each of the following things?

Used marijuana.

Drunk beer or wine.

Sold drugs.

Gotten drunk once in a while.

Sold or given beer or wine to a student.

Please mark T for "true" and F for "false" for each of the following statements.

T F A friend has offered to share marijuana with me.

T F A friend has offered to share cigarettes with me.

T F I sometimes use marijuana or other drugs just because my friends are doing it.

Attitudes Against Substance Use

If you think you would do each of these things, mark Y for yes. If you think you would not do each of these things, mark N for no.

Y N If your friends were doing something that would get them in trouble, would you try to stop them?

Y N If one of your friends was smoking some marijuana and offered you some, would you smoke it?

Are the following statements mostly true or mostly false?

T F I will never drink beer, wine, or hard liquor.

T F I will never try marijuana or other drugs.

T F Smokers look stupid.

T F People my age who smoke are show-offs.

T F I will never smoke cigarettes.

T F People who smoke marijuana have more fun than people who don't.

T F People my age who smoke cigarettes have more friends than people who don't.

T F Smoking makes a person look grown up.

T F Girls like boys who smoke.

T F If a young person smokes marijuana, he or she will be popular.

Attachment to School

Please tell whether you think each of the following statements is mostly true or mostly false.

T F I like the principal.

T F I like school.

T F I like to be called on by my teacher to answer questions.

T F I usually enjoy the work I do in class.

T F I care what teachers think about me.

T F I like my teacher.

T F Most of the time I do not want to go to school.

T F Sometimes I wish I did not have to go to school.

Self-Esteem

Please tell whether you think each of the following statements is mostly true or mostly false.

T F I am happy most of the time.

T F I am usually happy when I am at school.

T F Most of the time I am proud of myself.

T F Other students see me as a good student.

T F My grades at school are good.

T F I am satisfied with my school work.

T F I am proud of my school work.

T F Most boys and girls think I am good at school work.

T F I feel good about myself.

T F I can't do anything well.

T F Sometimes I feel bad about myself.

T F My teacher thinks that I am a slow learner.

T F I often wish I were someone else.

T F Sometimes I think I am no good at all.

T F Other boys and girls think I am a trouble-maker.

Assertiveness

How often do you do these things?

Compliment a friend.

Ask someone for a favour.

Ask people to give back things they have borrowed.

Complain when someone gets ahead of you in line.

Complain when someone gives you less change than you are supposed to get.

Tell people what you think even if they might think you are wrong.

Ask a teacher to explain something you don't understand.

Ask a person who is doing something wrong to stop.

Positive Peer Modeling

How important is it to you that your friends...

… are interested in the same things your are?

… tell you the truth?

… tell you how they feel?

… help you with the problems you have?

… keep their promises?

… care about you?

Are these statements mostly true or mostly false about your friends?

Most of my friends think getting good grades is important.

Most of my friends hate school.

My friends often try to get me to do things the teacher doesn't like.

As far as you know, are the following statements true or false about your best friend?

T F Likes school.

T F Tries to behave in school.

T F Gets into trouble at school.

If you think you would do each of these things, mark Y for yes. If you think you would not do each of these things, mark N for no.

Y N If your friends got into trouble with the police, would you lie to protect them?

Y N If a friend asked to copy your homework, would you let the friend copy it even if it might get you in trouble with a teacher?

How often do you do these things?

Compliment a friend.

Ask a person who is doing something wrong to stop.

Individual Variables

Attitudes About Police

Please tell us if you think each of the following statements is mostly true or mostly false?

T F Most police officers can be trusted.

T F The police would rather catch you doing something wrong than try to help you.

Coping With Stress

Please tell us if you think each of the following statements is mostly true or mostly false?

T F If I got into an argument with another student, I would talk to someone about it.

T F When I have to talk in front of the class, I try to relax.

T F When I have too many things to do, I try to do the things I like the most.

Last Year Drug Use—Prevalence

In the last year have you...

Y N Smoked cigarettes?

Y N Used smokeless tobacco?

Y N Drunk beer, wine, or “hard” liquor?

Y N Smoked marijuana (grass, pot, hash, ganja)?

Last Month Drug Use—Frequency

In the last month how often have you...

Smoked cigarettes?

Drunk alcoholic beverages?

Smoked marijuana?

Please answer the following questions as truthfully as possible. The questions are not a test—I just want to know what you think about these things.

Is it okay for you or someone your age to do each of the following things? (circle Y for yes or N for no)

Y N Cheat on school tests.

Y N Use marijuana.

Y N Break something that belongs to someone else just to be mean.

Y N Steal something worth less than $5.

Y N Drink beer or wine.

Y N Break into a car or house to steal something.

Y N Steal something worth more than $50.

Y N Sell drugs to another student.

Are the following statements mostly true (T) or mostly false (F) for you?

T F Sometimes a lie helps to stay out of trouble with the teacher.

T F It is all right to get around the law if you can.

T F It is okay to lie if it keeps your friends out of trouble.

T F Sometimes you have to be a bully to get respect.

T F If you find someone's purse it is OK to keep it.

T F Sometimes you have to cheat in order to win.

T F I often feel as if nobody at school cares about me.

T F Teachers don't ask me to help them in class.

T F I feel no one really cares what happens to me.

T F I often feel lonely at school.

T F Sometimes I feel lonely when I'm with my friends.

T F I don't feel as if I really belong at school.

T F I often feel left out of things.

T F Other students don't want to be my friend.

T F My friends try to help me if I have a problem.

T F I don't feel that I fit in very well with my friends.

T F Teachers don't call on me in class, even when I raise my hand.

T F My friends don't care about my problems.

T F I feel as if I belong at this school.

T F I feel close to my friends.

T F I know people in this school will help me when I need help.

Please answer the following questions—circle Y for yes or N for no:

Y N Do you expect to complete high school?

Y N Do you think it is important to work hard in school?

Y N Do you work hard in school?

How true about you are the following statements:

T F My schoolwork is messy.

T F I don't bother with homework or class assignments.

T F I turn my homework in on time.

T F If a teacher gives a lot of homework, I try to finish all of it.

T F The grades I get in school are important to me.

T F I often feel like quitting school.

Do you do the following things? (circle Y for yes or N for no)

Y N Take things that do not belong to me.

Y N Stay after school to be punished.

Y N Break other people's things.

Y N Try to hurt or bother people (by tripping, hitting, or throwing things).

Y N Tease other students.

Y N Fight with other students.

Y N Talk back to the teacher.

Y N Show off in class.

Y N Do things I know will make the teacher angry.

Y N Cheat on tests.

Y N Copy someone else's homework.

Y N Come late to class.

Y N Pay attention in class.

Y N Do what the teacher asks me to do.

During the last year, have your friends done the following things?

Y N Used marijuana.

Y N Drunk beer or wine.

Y N Sold drugs.

Y N Gotten drunk once in a while.

Y N Sold or given beer or wine to a student.

Please circle T for "true" or F for "false" for each of the following statements:

T F A friend has offered to share marijuana with me.

T F A friend has offered to share cigarettes with me.

T F I sometimes use marijuana or other drugs just because my friends are doing it.

Would you do each of these things? (circle Y for yes or N for no)

Y N If your friends were doing something that would get them in trouble, would you try to stop them?

Y N If one of your friends was smoking some marijuana and offered you some, would you smoke it?

Are the following statements mostly true (T) or mostly false (F) for you?

T F I will never drink beer, wine, or hard liquor.

T F I will never try marijuana or other drugs.

T F Smokers look stupid.

T F People my age who smoke are show-offs.

T F I will never smoke cigarettes.

T F People who smoke marijuana have more fun than people who don't.

T F People my age who smoke cigarettes have more friends than people who don't.

T F Smoking makes a person look grown up.

T F Girls like boys who smoke.

T F If a young person smokes marijuana, he or she will be popular.

T F I like the principal.

T F I like school.

T F I like my teacher to ask me questions in class.

T F I usually enjoy the work I do in class.

T F I care what teachers think about me.

T F I like my teacher.

T F Most of the time I do not want to go to school.

T F Sometimes I wish I did not have to go to school.

T F I am happy most of the time.

T F I am usually happy when I am at school.

T F Most of the time I am proud of myself.

T F Other students see me as a good student.

T F My grades at school are good.

T F I am satisfied with my school work.

T F I am proud of my school work.

T F Most boys and girls think I am good at school work.

T F I feel good about myself.

T F I can't do anything well.

T F Sometimes I feel bad about myself.

T F My teacher thinks that I am a slow learner.

T F I often wish I were someone else.

T F Sometimes I think I am no good at all.

T F Other boys and girls think I am a trouble maker.

Do you do these things, circle Y for yes or N for no

Y N Compliment a friend.

Y N Ask someone for a favour.

Y N Ask people to give back things they have borrowed.

Y N Complain when someone gets ahead of you in line.

Y N Complain when someone gives you less change than you are supposed to get.

Y N Tell people what you think even if they might think you are wrong.

Y N Ask a teacher to explain something you don't understand.

Y N Ask a person who is doing something wrong to stop.

Is it important to you that your friends...

Y N … are interested in the same things you are?

Y N … tell you the truth?

Y N … tell you how they feel?

Y N … help you with the problems you have?

Y N … keep their promises?

Y N … care about you?

Are these statements mostly true or mostly false about your friends

T F Most of my friends think getting good grades is important.

T F Most of my friends hate school.

T F My friends often try to get me to do things the teacher doesn't like.

As far as you know, are the following statements true or false about your best friend?

T F Likes school.

T F Tries to behave in school.

T F Gets into trouble at school.

Would you do each of these things? (circle Y for yes or N for no)

Y N If your friends got into trouble with the police, would you lie to protect them?

Y N If a friend asked to copy your homework, would you let the friend copy it even if it might get you in trouble with a teacher?

Do you think each of the following statements is mostly true or mostly false?

T F Most police officers can be trusted.

T F The police would rather catch you doing something wrong than try to help you.

T F If I got into an argument with another student, I would talk to someone about it.

T F When I have to talk in front of the class, I try to relax.

T F When I have too many things to do, I try to do the things I like the most.

In the last year, have you...

Y N … smoked cigarettes?

Y N … used smokeless tobacco?

Y N … drunk alcoholic beverages (beer, wine, or “hard” liquor)?

Y N … smoked marijuana (grass, pot, hash, ganja)?

In the last month, have you...

Y N … smoked cigarettes?

Y N … used smokeless tobacco?

Y N … drunk alcoholic beverages (beer, wine, or "hard" liquor)?

Y N … smoked marijuana (grass, pot, hash, ganja)?

Thank you for filling out this survey. Please return it to the researcher.

Appendix D: Demographic Measurement Instruments

Student form

ID #_____

1. I am _____ years old.

2. I am a: girl boy. (circle one)

3. I am the 1 2 3 4 5 6 7 8 9 10 child born to my mother. (circle one)

4. I am from the following ethnic background (check all the ones that are correct):

   __ White __ Native __ Black __ Asian __ Middle Eastern

   __ East Indian __ West Indian __ South American

5. I live with my (circle all the ones that are correct for you):

   mother father brother sister aunt uncle grandmother grandfather foster mother foster father step father step mother other _____.

6. I am a member of a gang. yes / no (circle one)

If you answered no, then go to question # 8 (skip question #7)

7. Name of gang? _____

8. I have lots of friends in my class. yes / no (circle one)

9. I have lots of friends outside my class. yes / no (circle one)

10. I have had a problem with bad touching. yes / no (circle one)

11. I have had a problem with bad hurting. yes / no (circle one)

12. Someone in my family has had a problem with alcohol. yes / no (circle one)

13. Someone in my family has had a problem with drugs. yes / no (circle one)

14. I go to church, synagogue, or temple to pray. yes / no (circle one)

15. We speak only English at home. yes / no (circle one)

16. We speak _____ at home.

Thank you for filling out this form. Please return it to the researcher.

School form (information at the individual level to be completed by teacher)

ID #_____

Can the child read at grade placement level. yes / no (circle one)

Can the child do math at grade placement level. yes / no (circle one)

The child is living in (socioeconomic status; SES) (check one):

____ poverty ____ working class ____ middle class ____ upper class

The child has behaviour problems (ADHD,BD, ODD). yes / no (circle one)

The child has emotional problems (e.g., depression or anxiety). yes / no (circle one)

The child has learning problems (slow learner, learning disabled). yes / no (circle one)

The child is a: boy / girl. (circle one)

There is high/moderate/low availability of drugs in the school area.

There is high/moderate/low police involvement in the school area.

To the best of your knowledge, is the child a member of a gang? yes / no / don't know (circle one)

Name of gang _____

Thank you for answering these questions. Please return this form to the researcher.

Appendix E: Measurement of the Significant Factors of the Mega Interactive Model of Substance Exposure and Use among Infants, Children, and Adolescents

Sources of information (key):

S = pre/post-test survey form

D = demographic instrument student

Dsi = demographic instrument school individual level

* Genetic Predisposition (e.g. family history of alcoholism) - D #11 & #12
* Depression - Dsi #5
* Personality Disorders (e.g. antisocial personality) - Dsi #4
* Risk-Taking Behaviour - Dsi #4 & S section on rebellious behaviour
* Economic Status (e.g. poverty) - Dsi #3
* Gang Membership - Dsi #10/11 & D #5 /6
* Peer Pressure - S sections on Peer Drug Modeling, Assertiveness, Self-Esteem
* Physical Abuse - D #10
* Sexual Abuse - D #9
* Culture – S section on Social integration

* Social Mores - S sections on Beliefs, Social Integration, Commitment to School, Attachment to School, Positive Peer Modeling

* Availability - Dsi #8 and information from the Royal Canadian Mounted Police

* Pharmacology – static for the listed substances across the program and comparison groups

Survey factors from Harmon (1993) and Mega Interactive Model of Substance Exposure and Use among Infants, Children and Adolescents factors:

- Beliefs = Social Mores
- Social Integration = Social Mores
- Commitment to School = Social Mores
- Rebellious Behaviour = Risk-Taking Behaviour
- Peer Drug Modeling = Peer Pressure and Attitudes
- Attitudes Against Substance Use = Attitudes
- Attachment to School = Social Mores

- Self-Esteem = Peer Pressure
- Assertiveness = Peer Pressure
- Positive Peer Modeling = Social Mores

Individual Variables:

- Attitudes About Police
- Coping With Stress
- Last Year Drug Use - Prevalence
- Last Month Drug Use - Frequency

Appendix F: Statistical Analyses Performed

Stage I

1a) ANOVA for each of the dependent variables to identify any differences at Time 1 (pre-test) between complete and incomplete data sets.

comparison (MIMSEUICA) x program (MIMSEUICA)

1b) A chi-square analysis of individual factors from the Mega Interactive Model of Substance Exposure and Use among Infants, Children and Adolescents (Appendix E) to identify any differences for each factor at time 1 (pre-test).

comparison x program on Genetic Predisposition

comparison x program on Depression

comparison x program on Personality Disorders

comparison x program on Risk-Taking Behaviour

comparison x program on Economic Status (e.g. poverty)

comparison x program on Gang Membership

comparison x program on Peer Pressure

comparison x program on Physical Abuse

comparison x program on Sexual Abuse

comparison x program on Cultures

comparison x program on Social Mores

comparison x program on Availability

comparison x program on Pharmacology

1. ANOVA for repeated measures attitudes (A), use (U), comparison (c), program (p)

Comparison

Ac (T1) x Ac (T2) x Ac (T3)

Uc (T1) x Uc (T2) x Uc (T3)

Program

Ap (T1) x Ap (T2) x Ap (T3)

Up (T1) x Up (T2) x Up (T3)

Stage II—Post hoc analysis of two subgroups of the sample delineated by risk for abusable psychotropic use

Using the collected data for the program group, designate two groups: i) at risk for abusable psychotropic use, and ii) low risk for abusable psychotropic use as defined by the Mega Interactive Model of Substance Exposure and Use among Infants, Children and Adolescents criteria.

Risk Group	Time 1 (T1)	Time 2 (T2)	Time 3 (T3)
At risk	A/U	A/U	A/U
Low risk	A/U	A/U	A/U

Comparison:

Ac(T1) x Ac(T2) x Ac(T3) by at risk or low risk

Uc(T1) x Uc(T2) x Uc(T3) by at risk or low risk

Program:

Ap(T1) x Ap(T2) x Ap(T3) by at risk or low risk

Up(T1) x Up(T2) x Up(T3) by at risk or low risk