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Adolescent and Adult Health:
Health Locus of Control, Health Status,
and Risk-Taking Beliefs and Behaviours

by

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Adolescent and Adult Health: Health Locus of Control, Health Status, and Risk-taking Beliefs and Behaviours" submitted by Karen Joyce Reilly in partial fulfillment of the requirements for the degree of Master of Science.



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Abstract

This study investigated Health Locus of Control (HLOC) and the health-related beliefs and behaviours of adolescents and adults. Subjects included 564 students, 259 parents, and 87 school personnel from two secondary schools, classified into one of three HLOC categories: Internal, External, and Contextual.

Multivariate Analyses of Variance indicated that Internal and Contextual adolescents differed from Externals on measures of health status, substance use, risk-taking and safety beliefs, and risk-taking and safety behaviours. No significant differences were found between Internal, External, and Contextual adults.

Correlational analyses revealed significant, positive relationships between Externality and substance use / risk-taking beliefs and behaviours among adolescents. Weak negative relationships were found between Externality and safety measures. Associations with Internality differed across schools. Among adults, significant negative relationships were found between Externality and measures of health status and safety. No significant relationships were found between the HLOC of parents and their children. Implications for Comprehensive School Health Programs are discussed.

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TABLE OF CONTENTS

	<u>PAGE</u>
APPROVAL PAGE	ii
ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES.....	x
<u>CHAPTER</u>	<u>PAGE</u>
I. INTRODUCTION	1
Role of the School	4
Rationale	6
The Problem	8
The Current Study	8
Overview	9
II. Literature Review.....	10
Comprehensive School Health (CSH)	10
CSH Conceptualized.....	11
Implementation and Evaluation	15
Summary	17
Factors Influencing Health	18
Health Behaviour	19
Family Variables	20
Health Beliefs.....	22
Summary	25
Health Locus of Control (HLOC).....	26
Measurement of HLOC and Scale Development	27
HLOC and Related Factors	29
Physical Health Status	31
Health Knowledge and Health Protective Behaviour	31
Substance Use	32
Risk-Taking	35
Contradictory Findings	37
Summary	39
Development of HLOC	40

<u>Chapter</u>	<u>Page</u>
Implications for Health Education	42
Summary	44
Chapter Summary	45
Research Questions	47
III. METHOD	48
Research Participants and Method of Data Collection	48
Students.....	49
Parents	49
School Personnel	51
Instrument	52
HLOC Scale	52
Health Beliefs Scale	55
Health Behaviour Scale	57
IV. RESULTS	61
Descriptive Results	61
Inferential Results	67
Research Question 1	67
Summary	70
Research Question 2	71
Summary	74
Research Question 3	74
School 1	74
School 2	76
Summary	77
Research Question 4	78
School 1	78
School 2	79
Summary	80
Research Question 5	81
Chapter Summary	83
V. DISCUSSION	85
Results and Their Relationship to Current Literature	85
Adolescents	85
Health Status	85
Substance Use	86
Risk-Taking	87
Beliefs and Behaviours	88
Adults	90
Health Status	90
Substance Use	91

	<u>Page</u>
Risk-Taking	91
Beliefs and Behaviours	92
Parent and Child HLOC	93
Critique	93
Strengths	93
Limitations	94
Recommendations for Future Research	95
Implications for Health Promotion and Education	97
Conclusions	101
REFERENCES	104
APPENDICES	113

LIST OF TABLES

Table	Page
1. Distribution of Students by School, Gender, and Age	50
2. Distribution of Parents by Marital Status and Gender	51
3. Distribution of School Personnel by Position and Gender	52
4. Factor Loadings for HLOC Scale on Rotated Factor Matrix	54
5. Factors of the Health Beliefs Scale	55
6. Factor Loadings for Health Beliefs Scale on Rotated Factor Matrix	56
7. Factors of the Health Behaviour Scale	58
8. Factor Loadings for Health Behaviour Scale on Rotated Factor Matrix	59
9. Health Behaviour and Revised Health Beliefs Subscales	60
10. Student Subscale Means and Standard Deviations	62
11. Adult Subscale Means and Standard Deviations	63
12. Distribution of Students According to HLOC Subscale Scores	64
13. Distribution of Adults According to HLOC Subscale Scores	64
14. Frequency and Percent of Students in Categories of HLOC	65
15. Frequency and Percent of Adults in Categories of HLOC	65
16. Adolescent HLOC Scale Means for Categories of HLOC	66
17. Adult HLOC Scale Means for Categories of HLOC	66
18. Frequency and Percent of Students in Categories of HLOC (Final Data Set)	68
19. Adolescent Means and Standard Deviations	

	as a Function of School and HLOC	69
20.	Adolescent Univariate F's as a Function of HLOC and School	70
21.	Frequency and Percent of Adults in Categories of HLOC (Final Data Set)	72
22.	Adult Means, Standard Deviations and Univariate F's as a Function of School and HLOC	73
23.	Correlations Between Students' HLOC, Beliefs and Behaviours: School 1	75
24.	Correlations Between Students' HLOC, Beliefs and Behaviours: School 2	77
25.	Correlations Between Adults' HLOC, Beliefs and Behaviours: School 1	79
26.	Correlations Between Adults' HLOC, Beliefs and Behaviours: School 2	80
27.	Correlations Between Parent and Child HLOC: School 1	81
28.	Correlations Between Parent and Child HLOC: School 2	82

LIST OF FIGURES

Figure	Page
1. The Wheel of CSH Programs	13

Chapter One

Adolescence may be characterized as a period of transition and exploration, during which time many young people experiment with drugs, alcohol, and a variety of risk-taking behaviours (Boyer & Kegeles, 1991). It is the stage in life when individuals are developing attitudes and behaviors that affect their future health and well-being (NCRSC, 1990). For many adolescents, this period includes engaging in many risk-taking behaviours that may have serious ramifications, such as sexually transmitted disease, pregnancy, and addiction.

Two outstanding problem areas for youth are sexual activity and alcohol / drug use. Adolescents have been identified as a population at serious risk for developing AIDS, recent estimates indicating that as many as 20% of all HIV infections occur among adolescents and youth (Yao, 1992). This is due to increased experimentation with sexual activity, drug/alcohol use, and a perception of invulnerability to disease that increases the likelihood of engaging in risky behaviours (Boyer & Kegeles, 1991; Williams & Ponton, 1992). Numerous studies detail the prevalence of substance use among adolescents (Bertrand, Smith, Bolitho, & Hornick, 1994; King, Beazley, Warren, Hankins, & Radford, 1989; King & Coles, 1992; NCRSC, 1990; Volkan & Fetro, 1990). In the US, 65% of high school seniors use alcohol on a monthly basis and 58% of adolescents have tried an illicit drug (Volkan & Fetro, 1990). The NCRSC indicates that over 3.5 million adolescents between 12 and 17 years old have tried marijuana and one-third of these are regular users. The implications of such widespread use go beyond the immediate and long term direct effects: secondary effects include absenteeism, poor academic

performance, loss of employment, and severe mood changes that may lead to depression, suicide, violence, and motor vehicle accidents (Green & Kreuter, 1991).

Whereas in the past the major threats to health were infectious and other diseases, many of today's health problems are rooted in 'behaviours' (Allensworth & Kolbe, 1987; Cameron, Mutter, & Hamilton, 1991; Kane, 1993; NCRSC, 1990). The primary causes of adolescent mortality and morbidity stem from such behaviours. Further, many of the risk-taking behaviours and unhealthy practices adolescents engage in are inter-related. It is apparent from the literature that those adolescents who smoke and drink often experiment with drugs, unprotected sex, and are more prone to failure in school (Cameron, et al., 1991; Dryfoos, 1985; King & Coles, 1992). In addition, adolescents are engaging in risky health behaviours at consistently younger ages, when their developmental levels and experience have not equipped them to cope with the consequences of their actions (NCRSC, 1990).

Several large-scale studies of Canadian youth have drawn attention to the health of Canada's young people (Canadian Institute for Child Health, 1989; King & Coles, 1992; King et al., 1989). The CICH study identifies "injuries" as the number one killer of adolescents, followed by suicide. Of the former, fatalities are primarily a result of motor vehicle accidents where alcohol is often a contributing factor. CICH (1989) found that 44% of tested drivers under 21 involved in fatal crashes had an elevated blood alcohol level. The Canada Youth and AIDS Survey (King et al., 1989) highlights the prevalence of sexual risk-taking among adolescents and the large discrepancy between knowledge, attitudes and behaviours. The authors point to the perception of

invulnerability among adolescents to explain their behaviour, "As most do not believe their own sexual behavior could place them at risk..., they do not seriously contemplate either abstinence...or protecting themselves or their partners..." (King et al., 1989, p.140). A later study, *The Health of Canada's Youth* (King & Coles, 1992) provides descriptive and comparative statistics on a variety of health-related behaviours, including substance use among adolescents. Results indicate that by age 15, 94% of Canadian youth have used alcohol, with 33% of boys and 24% of girls reporting weekly usage. By age 16, approximately 25% of youth are smoking on a regular basis (King & Coles, 1992). Local statistics parallel their national counterparts: 80% of Calgary teens aged 12 to 18 have used alcohol, 19% have used marijuana, and 50% have used tobacco (Bertrand et al., 1994).

Research has shown that the behavioural choices of adolescents may be influenced by those of parents and school personnel (Bertrand et al., 1994; Dielman, Leech, Becker, Rosenstock, & Horvath, 1982; Onestak, 1989; Lavin, Shapiro, & Weill, 1991) through modelling, reinforcement, and the creation of healthy environments. Regrettably, many adults fail to model healthy lifestyles. King & Coles (1992) report that 30% of mothers and 39% of fathers smoke cigarettes regularly or occasionally. In addition, only 24% of fathers and 18% of mothers engage in weekly physical exercise. Similarly, 29% of school personnel smoke, while less than 10% engage in physical activity on a regular basis (Survey conducted by the U.S. Department of Health and Human Services, 1990, cited in Lavin, Shapiro, & Weill, 1991). Given the environments to which many adolescents are exposed, it is little wonder that many fail to make wise

behavioural choices.

Though most health problems experienced by young people do not result in death, the presence of health-compromising behaviours or risk factors may be utilized as a relevant measure of present and future health status (Kane, 1993). Such unhealthy and risky behaviours “when established early in life, will eventually account for a large portion of physical and social morbidity and mortality” (Kane, 1993, p.16). Adolescents who fail to develop healthy lifestyles are at higher risk of developing heart disease and cancer during their adulthood (Kane, 1993). Substance use, inadequate exercise, and poor nutrition are major contributing factors to these ailments, and they remain the leading cause of death among adults in North America.

Of great importance is the “preventable” nature of adolescent mortality and health-related problems. As most such problems stem from behaviours, they are amenable to change through education, public policy, law enforcement, behavioural change, and specific interventions (Kane, 1993). Schools may play a key role in the change process through the promotion and implementation of co-ordinated programs designed to influence the factors affecting the health of youth and providing adolescents and their families with the opportunity to acquire the knowledge, skills and attitudes conducive to good health.

Role of the School

“Good health and learning are intimately connected. Children and youth who have health problems, who abuse drugs, or who engage in other self-destructive behaviors are more likely to have academic and social problems or to drop out of school”

(Calgary Board of Education, 1991). It has become increasingly clear that education and health are “inextricably intertwined” (NCRSC, 1990). Perhaps more than any other organization, schools have a special opportunity to assist and prepare adolescents to live healthy and productive lives and to establish positive health-promoting behaviours (Allensworth & Kolbe, 1987; Kane, 1993). Children spend approximately 6 hours per day in the classroom and educators possess the necessary knowledge regarding the social, emotional, and physical development of children. Furthermore, school leaders have the ability to influence and implement environmental factors conducive to protecting, supporting, and reinforcing healthy behaviours (Kane, 1993).

The state of adolescent health in the United States has been described by the National Commission on the Role of the School and the Community in Improving Adolescent Health (NCRSC) as a “national emergency”. The commission recommendations include a call for schools to play a stronger role in improving adolescent health, offering students “a new kind of health education” (NCRSC, 1990, p.34), a comprehensive approach which involves close collaboration with families and the community. The complexities of the problems facing youth require “new levels of cooperation and collaboration” (Nader, 1990) and solutions of a comprehensive nature. A similar sentiment is echoed by the Canadian Association for School Health, “The health and well-being of children and youth must be a fundamental value of Canadian society. Recently, urgent health and social problems have underscored the need for collaboration among young people, families, schools, agencies, communities and governments in taking a comprehensive approach to school-based health promotion”

(CASH, 1991). Such an approach is promoted by numerous researchers and professional organizations, and reflects the movement at the national and international levels toward a multisectorial and multidimensional approach to health promotion and primary prevention (Tones, 1986).

Rationale

Comprehensiveness in the context of health education requires a broad conceptualization of the many factors influencing the development and maintenance of health behaviours. It entails a movement beyond the traditional focus on “instruction” to a consideration of the environmental, social, familial, and personal/psychological determinants of health. Further, it requires a consideration of the relationship between knowledge, skills, attitudes, and behaviours in order that health education fulfill its mandate, as outlined by the World Health Organization (Tones, 1986):

- to raise individual competence and knowledge about health and illness, prevention and coping
- to increase competence and knowledge in the utilization of the health care system and understanding of its functioning
- to increase awareness re: social, political, and environmental factors that influence health

Among the many personal determinants of health behaviour, Health Locus of Control (HLOC) is recognized within health education literature as an important variable for understanding “how children develop skills and confidence in their ability to manage their lives and experience health in its broadest definition” (Parcel, Nader, & Rogers,

1980). HLOC refers to the extent to which individuals perceive themselves to be in control of their own health (internal control) in contrast to perceiving that their health is dependent upon external forces such as chance, luck, or the actions of others (external control). It has been linked to health status, self-esteem, and numerous health-related behaviours (Gochman, 1988; Kist-Kline & Lipnickey, 1989; Quadrel & Lau, 1989; Strickland, 1978; Wallston & Wallston, 1982). The bulk of the literature supports the position that individuals who possess higher internal beliefs and/or lower external beliefs are more likely to demonstrate health-promoting behaviours and avoid risky behaviours.

Arguing for the promotion of “self-empowerment” within health education endeavours, numerous researchers and professionals recommend targeting HLOC within the context of comprehensive health programs (Parcel et al., 1980; Tones, 1986). It has been suggested that programs might be modified to match the HLOC of participants, thereby increasing their appeal and effectiveness (Kist-Kline & Lipnickey, 1989; Lau, 1988; Quadrel & Lau, 1989; Riggs & Noland, 1984; Wallston & Wallston, 1982). However, the most widely accepted approach involves the promotion of an internal HLOC (Arborelius & Bremberg, 1988; Kist-Kline & Lipnickey, 1989; Parcel et al., 1980). Such an approach is based on literature suggesting that internals enjoy more positive physical health status, are more likely to engage in preventive health behaviour, and are less likely to abuse substances or engage in risky behaviour. Thus, within the context of CSH programs adolescents may come to accept greater responsibility for their health and perceive of their health as contingent upon their own actions. In so doing, it is expected that they will choose to engage in health-protective behaviour, shun risky

behaviour, and enjoy relatively good health.

The Problem

Despite empirical support for the importance of HLOC as a determinant of health-related attitudes and behaviours, and the potential utility of this construct within health education, comparative and correlational studies investigating internal-external HLOC in terms of “risk-taking” behaviours are limited, and have produced contradictory findings. Although many reports of the relationship between HLOC and substance use in specific populations are available, to date there is little comprehensive research involving a consideration of its relationship to a broad range of risky behaviours. Few studies have utilized a general adolescent sample, and none have included both adults and adolescents. Further, despite literature documenting the influence of familial variables on the health beliefs and behaviours of adolescents (Bertrand et al., 1994; Dielman et al., 1982; Onestak, 1989), little attention has been paid to the possible antecedents of particular HLOC orientations. The investigations to date support a relationship between parent and child HLOC (Lau, 1982; 1988). However, this relationship has not been demonstrated using adolescent populations.

The Current Study

The current study focuses on the above issues. Specifically, this study investigates the relationship between HLOC, physical health status, and the risk-taking behaviours of adults and adolescents, and also compares individuals of differing HLOC's in terms of these variables. Further, it considers the relationship between beliefs and behaviours pertaining to risk-taking and substance use. Finally, it investigates the

relationship between parents' HLOC and that of their children. In so doing, this study aims to address the deficits and discrepancies within the current literature.

Overview

This chapter provides a context for the discussion and investigation to follow. Chapter two presents a review of the literature in the areas of CSH, health behaviour, and HLOC, and ends with a statement of the research questions addressed in this study. Chapter three provides a description of the samples and methodology employed. The results of the study are presented in chapter four, and chapter five provides a discussion of the results, assesses the strengths and limitations of the study, and explores the implications for health education and future research.

Chapter 2

Literature Review

This chapter is divided into three major sections. It begins with a review of the comprehensive school health concept. This is followed by a general discussion of the factors influencing health, including behaviour, beliefs and familial influences. The final section provides a detailed review of the literature specific to HLOC, including a discussion of the concept, its measurement and development, and its relationship to specific areas of health behaviour.

Comprehensive School Health

The goal of comprehensive school health (CSH) education is “to help young people achieve their fullest potential by accepting responsibility for personal health decisions and practices, by working with others to maintain an ecological balance helpful to society and the environment, and by becoming discriminating consumers of health information, health services and health products” (CBE, 1991, p.1). In short, CSH programs aim to improve adolescents’ health-related knowledge, beliefs, and behaviours, while fostering a sense of responsibility and control over health. CSH programs vary according to community needs and desires; however, good programs are multi-focussed in nature, abandoning traditional single-issue interventions which “are less effective, oriented more towards researcher needs, and fail to address the most pressing needs of the target population” (Collins, 1993, p.12). The following sections will discuss CSH in terms of its conceptualization and implementation in Canada and the U.S.

CSH Conceptualized

Cameron et al. (1991) explain that the health-related problems of today's youth will not respond to simplistic or one-dimensional approaches; what is needed is a multi-dimensional comprehensive approach. Defined broadly, CSH is "health education in a school setting that is planned and carried out with the purpose of maintaining, reinforcing or enhancing the health, health-related skills, and health attitudes and practices of children and youth that are conducive to their good health" (Davis, Gonser, Kirkpatrick, Lavery, & Owen, 1985). Essential to such a broad conceptualization of health and health education is a recognition of the need to view an individual's health within the broader context of the individual's environment (Cameron et al., 1991). Such an approach is consistent with trends in prevention literature and public policy, as exemplified in Achieving Health For All: A Framework for Health Promotion (Epp, 1986). Epp called for a broader health promotion strategy wherein health is viewed within the larger environmental context, and links between health and the social and physical environment are considered.

A common theme throughout the CSH literature is the need to develop and maintain links with various individuals and groups in society. CSH involves educators, parents, and the community in all aspects of programming. Parents and educators are viewed as both learners and instructors, and are seen as a vital component to success (Cameron et al., 1991; Davis et al., 1985; Green & Kreuter, 1991; Kane, 1993; Mutter, Ashworth & Cameron, 1990; Nader, 1990; NCRSC, 1989).

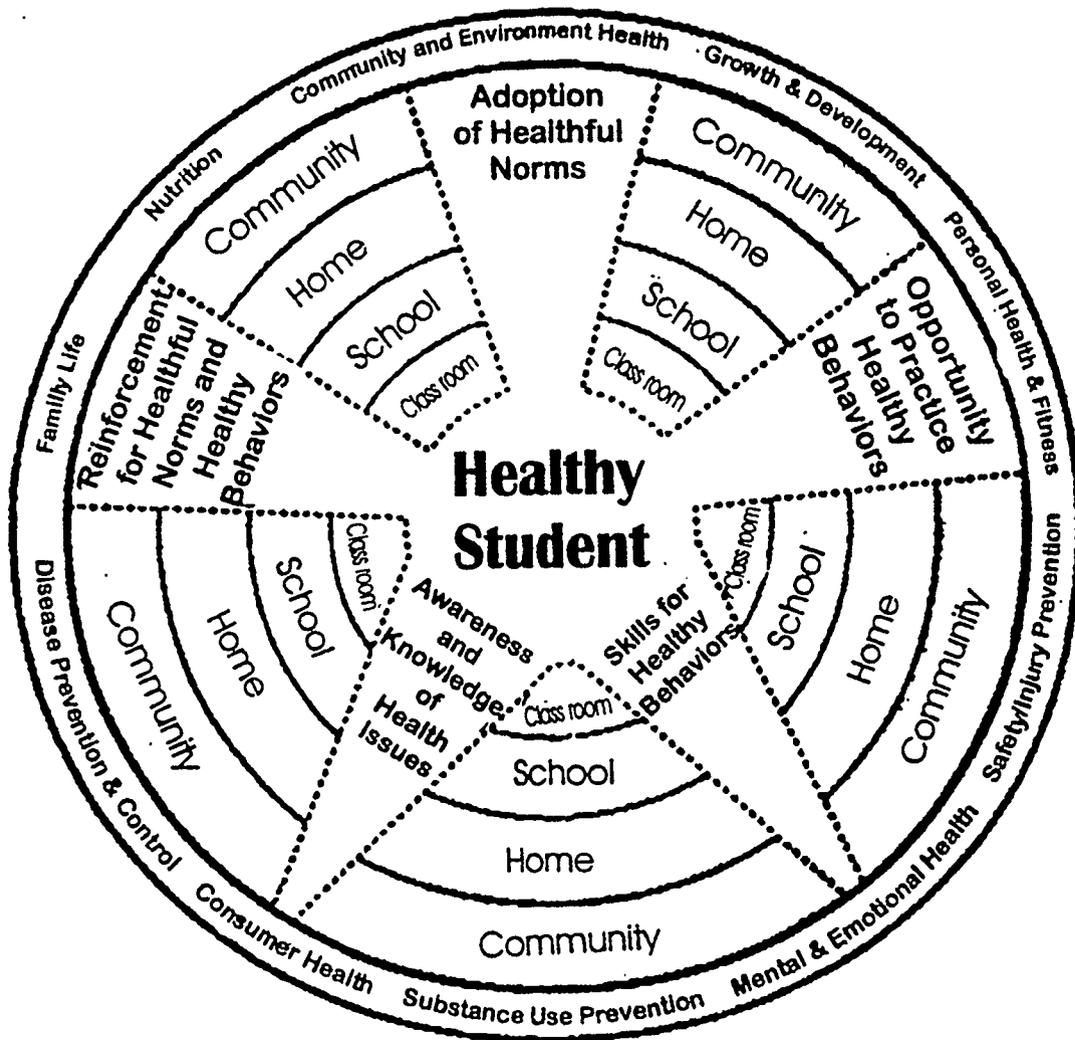
Components. The comprehensive approach holds that health instruction should

be coordinated with school health services, within a healthful school, home and community environment. The purposes of each of these program components complement and are complemented by the procedures and activities of the others, and may produce synergistic effects (Allensworth & Kolbe, 1987; Cameron et al., 1991; CBE, 1991; Davis et al., 1985; Mutter et al., 1990). Kolbe (1986) delineates the immediate, short-term and long-term outcomes of such effects, linking health-related behaviours (immediate outcomes) to health status and cognitive performance (short-term outcomes), which in turn are linked to health status and educational achievement (long-term outcomes). Kolbe's (1986) conceptualization exemplifies the intimate connection between education and health while recognizing the value and necessity of a collaborative approach. A recent model for CSH programming which incorporates the above elements and delineates their inter-relationships is described by Kane (1993).

Kane (1993) presents a model for CSH which incorporates four levels of involvement: classroom, school, home, and community. The healthy student is seen as the "focal point of classroom, school, home (family), and community efforts to promote health" (Kane, 1993, p.23). Figure 1 illustrates the interrelationships among the various components of the model.

According to Kane's (1993) conceptualization, the adoption of healthy behaviours is the result of five factors which are represented by the spokes on the wheel: awareness and knowledge of health issues; behavioural skills; opportunities to practice healthy

Figure 1. The Wheel of CSH Programs



Source: Kane (1993). Reprinted with permission from Step by Step to Comprehensive School Health: The Program Planning Guide, ETR Associates, Santa Cruz, CA. (ERIC Document 360 304).

behaviour; provision of support through the adoption of healthy norms by schools, families and the community; reinforcement of healthy norms and behaviours.

The responsibilities of the various environments (classroom, school, home, and community) for promoting these factors are delineated by the width of the spokes as they pass through the rings of the wheel. Thus, while the school assumes the primary responsibility for teaching health-related skills and promoting awareness of health issues, the home and community provide the greatest opportunities for practice and reinforcement. Finally, the outer rim of the wheel outlines the content areas of CSH. These include mental and emotional health, safety / injury prevention, disease prevention and control, substance use prevention, and personal health and fitness. Thus, interventions aimed at a particular content area, such as substance use, will incorporate the five factors outlined above and encourage the involvement of each “level” or environment.

In summary, according to Kane (1993), five factors promote the development and adoption of healthy behaviours among adolescents, including knowledge, skills, practice, reinforcement, and adoption of healthy norms. These factors are fostered within four levels of involvement, or “environments”, ranging from the classroom to the community. CSH programs, according to this model, teach health-related knowledge and skills, provide opportunities for practice and reinforcement at the school, home and community levels, and encourage healthy behaviour by modelling healthful norms at all levels of society. While the classroom and school environments take the primary responsibility for developing knowledge and skills, the home and community play a pivotal role in the

reinforcement, modelling, and practice of healthy behaviour.

Implementation and Evaluation

The evaluation of CSH programs in schools has shown them to be effective at influencing health-related attitudes and behaviour (Arborelius & Bremberg, 1988). Green & Kreuter (1991) comment that contemporary school health literature in the U.S. is “suddenly laden with evaluations of well-designed school health and school health education programs” (p. 355). The School Health Education Evaluation (SHEE), a 3 year prospective study involving 30, 000 students from 20 states, found that exposure to comprehensive health education produces positive gains in knowledge, attitudes and practices, and that repeated exposure leads to greater gains (Cameron et al., 1991).

Limited Canadian data are available, though several large-scale CSH research projects are currently under way, including the Dartmouth Health Promotion Study (Cogdon & Belzer, 1991), the British Columbia “Healthy Schools Project” (Office for Health Promotion, B.C. Ministry of Health, 1991), and the “Partners for Healthy Living” project in Calgary. Preliminary data from the first year of the Dartmouth study suggest a positive effect of CSH programming. After the first year of the project, 87% of students indicated that they spoke with their parents about heart-healthy food, 66% of students from low socioeconomic families made healthy dietary changes, and 96% of the parents indicated a desire to become more involved with the school’s health promotion programs. Such findings demonstrate the potential impact of CSH on the behaviour and lifestyle choices of both students and their parents.

In addition, numerous local and provincial school - community - professional

coalitions have been founded, which operate nationally as the Canadian Association for School Health (CASH). CASH's role includes advocacy for CSH programs, promoting awareness, and provision of a network for the sharing of information (CASH, 1991). Such projects and activities are in response to changing federal policies, the growth of knowledge about health, and the prominence of health issues such as AIDS and substance abuse (Cameron et al., 1991).

Despite such initiatives, an examination of Canadian provincial and territorial curriculum guidelines suggests that "the comprehensive approach is still far from being a reality in this country" (Cameron et al., 1991; Mutter et al., 1990). Though in general a wide range of topics are offered, many are optional; there is inadequate class time allotted, and "in spite of provincial or territorial guidelines which promote a more comprehensive approach to health education, there is still a tendency at the school board level to concentrate on single 'crisis' issues" (Mutter et al., 1990, p.4) such as AIDS, tobacco, and alcohol use. Similar conclusions were reached by the participants of the Exchange '90 conference in its review of their jurisdictions progress in implementing CSH programs (CASH, 1991). Though it appeared most provinces and territories had established policies on instruction, such policies did not exist in relation to the other components of CSH, including the delivery of health and social services and promoting healthy school environments (CASH, 1991). It appears there remains an emphasis on instruction, despite literature suggesting that this is not sufficient in itself to alter behaviour.

The effectiveness of CSH programs has been demonstrated in the United States

and in preliminary Canadian findings. Such programs positively influence the health-related knowledge, behaviour, and attitudes of students and their families. However, despite such support, health education in Canada has yet to fully embrace the concept of comprehensiveness.

Summary

CSH programs aim to influence health-related behaviours and beliefs, and foster a sense of personal responsibility for health. It is believed that these immediate or short-term outcomes will promote positive physical health status, and enhance cognitive and academic performance. CSH programs are collaborative endeavours between schools, families, and communities in the attempt to create and support healthy environments which model and reinforce healthy behavioural choices among youth.

Comprehensiveness necessitates a broader conceptualization of the factors influencing health and the means by which health promoting behaviours are developed and maintained, and health-risking behaviours are reduced. Such a focus is essential as it is risk-taking behaviour that most influences adolescent health status (CASH, 1990; Kane, 1993; Whatley, 1991). Educational and behavioural research indicates that in order to achieve our aims, traditional knowledge/information based programs and single-focus “stop-gap” efforts at health education are ineffective means by which to alter behaviours. It is essential that the relationship between knowledge, skills, attitudes and behaviours be considered. Further, programs should assist students to assess health risks, consider potential consequences of their behaviors, examine factors that influence their behaviours, and develop skills for promoting their health (Kane, 1993). Opportunities for

practice of healthful behaviour within the school and community, and family/peer support and reinforcement “serve to increase the likelihood of long term cognitive and behavioral changes among students” (Cameron, et al. 1991; Collins, 1993; Kane, 1993). Further, the value which peers, school leaders, family and community members place on healthful norms “reinforces positive self-concepts and produces positive attitudes toward the practice of healthy behaviors” (Kane, 1993, p.23). Thus, CSH programs seek the involvement of all levels of society in order to develop, model and reinforce healthy attitudes and behavioural choices.

Factors Influencing Health

CSH aims to influence the health of adolescents by encouraging healthy behavioural choices and discouraging health risk-taking behaviour. In order to achieve such aims, CSH programs seek a greater understanding of the factors influencing health-related behaviour. Numerous factors may influence and interfere with an individual’s development and health status, including peer group / familial / societal influences, perceptions of health and health responsibilities, and risk-taking behaviours (Whatley, 1991). In striving to promote positive, preventive behaviours, and discourage risky behaviours, CSH programs move beyond the mere provision of information, which has been ineffective in altering behaviour (Riggs & Noland, 1984), to addressing those cultural, social, environmental, and psychological factors which influence an individual’s health-related behaviour. The following sections will discuss several factors influencing health, including the inter-relationships among health-related behaviours, the importance of adolescent attitudes and beliefs, and the role of familial variables.

Health Behaviour

The current trend towards a comprehensive approach to health education and promotion recognizes that health-related behaviours are a key determinant of present and future health status (Cameron et al., 1991; Kane, 1993; NCRSC, 1990). The statistics presented in Chapter One demonstrate the prevalence of unhealthy behaviour among adolescents. Further, research indicates that many health-risk behaviours tend to co-occur. Individuals who take serious risks with their health in one area typically do so in others (Cameron, et al., 1991; Conway, 1992; Dielman et al., 1987; Dryfoos, 1985; Kane, 1993; King & Cole, 1992; Volkan & Fetro, 1990).

Kane (1993) states that adolescents who use alcohol and drugs are more likely to engage in other health-compromising behaviours, including dangerous driving (i.e., driving while influenced by drugs/alcohol) and unprotected sex. Frequent consumption of tobacco, alcohol, and unhealthy food have been linked to physical inactivity, poor school performance, and health problems (King & Coles, 1992). In a factor analysis of their Canadian survey, King & Coles (1992) found that seven categories fell together in one grouping: mental health, social health, relationship with parents, adjustment to school, health status, physical fitness and participation in sports. They note that an individual who experiences difficulty in one of the areas, more than likely experiences difficulty in all of them. Similar results are noted by Eiser, Eiser, Gammage & Morgan (1989) who found smoking behaviour to be predictive of more general beliefs about health and illness. Smokers were less likely to acknowledge that eating good food and exercising were important for good health. Eiser et al. (1989) warn that a potential

danger of narrowly-defined approaches to health education (i.e., single-issue) is the failure to address these broader classes of behaviour and attitudes.

Conway (1992) suggests that an important ramification of such inter-relationships is that health behaviors which cluster into the same general category may have common causes and consequences. Thus, "identifying factors that have a common influence on a variety of health behaviors is an important step both for understanding causal influences on health behaviors and for developing interventions to modify these behaviors" (p. 3). Programs in health education must attend to such inter-relationships, to the many variables which influence health-related behaviours, and the processes by which such behaviours are learned. The comprehensive approach entails a movement beyond knowledge-based instruction, to a consideration of cognitive/psychological determinants of health, (i.e., individual attitudes, values, and HLOC), and social/environmental variables in order to facilitate changes in health behaviour (Riggs & Noland, 1984).

Family Variables Influencing Behaviour

Investigating the relationship between the health beliefs and behaviours of parents and those of their children, Dielman et al. (1982) found parental health behaviours and parental demographic variables to be significant predictors of children's health behaviours. Onestak (1989) has identified familial influence as "one of the most important social factors affecting substance use and abuse in adolescents" (p. 3). General family factors related to substance abuse include family cohesiveness and communication patterns (Barnes, 1984; Bertrand et al., 1994). Adolescents in families "characterized by poor family management styles, conflictual parent-child relationships,

little perceived closeness between parent and child, inadequate communication, ... low levels of parental support, and inconsistent discipline practices typically report greater substance use” (Bertrand et al., 1994, p.18). Particularly important is parental modeling, not only of specific behaviours, but of problem-solving and coping styles. It has been suggested that “parental coping styles involving escape or substance use may be causally related to teenage substance use via modeling processes” (Onestak, 1989, p.5).

In an attempt to identify clusters of family variables related to adolescent substance use, Onestak (1989) assessed family support, communication and conflict intensity, parental coping styles, substance use, health status, life stress, and attitudes toward teen substance use. Results identify parent and sibling alcohol use as important determinants of the level of adolescent alcohol use, “supporting hypotheses about the role of modeling, facilitation, and lack of negative consequences as contributors to adolescent substance use” (p. 14). In turn, income, family stress, and level of parents’ depression had positive direct effects on parental alcohol use. Onestak concludes that “parents need to become more aware of the powerful modeling effects their own drinking has on their adolescent. Parental use of alcohol may not only model use, but also communicates attitudes about alcohol use that minimize barriers and the negative consequences of adolescent substance use” (p. 16).

In a local study investigating substance use among Alberta teens, Bertrand et al. (1994) also found support for the parental modeling hypothesis; for all substances investigated, “there was a clear tendency for adolescents to report lifetime use if they have lived with a parent who used any substance” (p. 19). Other factors exhibiting strong

relationships to adolescent substance use included characteristics such as family functioning, family environment, parental monitoring of behaviour and parental involvement, with adolescents reporting negative family characteristics more likely to report lifetime use of substances.

Parental health-related behaviour and beliefs may directly influence the risk-taking behaviour of their children through modelling and the communication of attitudes supporting such behaviour. Adolescent behaviour is also influenced by more general family characteristics such as cohesiveness, discipline, and communication styles. Such findings underscore the importance of including significant adults within CSH programming.

Health Beliefs

Numerous theories have been proposed in the attempt to explain possible factors relating to an individual's propensity for engaging or failing to engage in preventative health behaviours. Among the many personal determinants of health actions, cognitive structures such as beliefs, expectations, perceptions, values, and attitudes have received the greatest attention (Wallston, 1992). Such cognitions provide individuals with a means of filtering, interpreting and predicting events (Gochman, 1988). Cognitions regarding control over health are thought to be major determinants of health-related behaviour, and health status (Wallston, 1992; Zindler-Wernet & Weiss, 1987) and much of the research on health beliefs has focused on the concept of HLOC as predictive of an individual's potential to adopt and pursue healthy behaviours (Kist-Kline & Lipnickey, 1989).

HLOC refers to an individual's beliefs regarding the source of control over his or her health (Quadrel and Lau, 1989). Most often, HLOC measures the extent individuals perceive themselves to be in control of their own health (internal control) in contrast to perceiving that their health is dependent upon external forces such as chance or powerful others (Gochman, 1988; Kist-Kline & Lipnickey, 1989; Wallston, 1992). It has been linked to a variety of health behaviours, including information seeking, adherence to medical regimes, weight management, preventative dental care, contraceptive use, exercise, smoking, alcohol use and risk-taking (Strickland, 1978; Wallston & Wallston, 1982; Lau, 1988). It is thought that individuals with internal beliefs are more likely to demonstrate health-promoting behaviours and greater adaptive functioning since they feel responsible for the outcomes of their actions (Gochman, 1988; Kist-Kline & Lipnickey, 1989; Strickland, 1978). "When individuals feel that control over health does not lie outside their grasp, then they can take responsibility to bring about a desired health outcome" (Zindler-Wernet & Weiss, 1988, p.160). King et al. (1989) comment that in order for knowledge to influence decision making and behaviour, individuals must believe that it is their own behaviour and not that of others that places them at risk, and that this risk may be eliminated or reduced by modifying certain personal behaviour. Thus, in order for individuals to engage in preventive health behaviour and refrain from risky behaviour they must believe that they are responsible for their health and that their own behaviour can influence outcomes.

In addition to HLOC, numerous other attitudinal and belief variables may influence health-related decisions. According to the Health Belief Model (HBM)

decisions regarding preventive actions are influenced by the perceived seriousness of the disease or health threat, perceived susceptibility or vulnerability, and perceived benefits and costs of actions (Ronis, 1992). Rosentstock, Strecher, & Becker (1988) incorporate self-efficacy into the HBM, suggesting that for behavioural change to occur individuals must believe themselves to be competent to implement that change. Thus for preventive behaviour to occur one must perceive that a risk is present and sufficiently serious, believe that one is susceptible to illness and injury, believe that a particular action would be beneficial and that the benefits of a particular action outweigh the costs or barriers, and feel confident in one's ability to enact change.

The problem of risk-taking behaviour in adolescence may, in part, be explained by the common perceptions and beliefs they hold. As described above, health-related action depends upon the occurrence of a variety of attitudinal factors including perceptions of control, susceptibility to illness and injury, existence of threat, benefits of actions and self-efficacy. However, perceptions of invulnerability and uniqueness are common among adolescents and may influence the degree to which adolescents engage in health compromising behaviours (Boyer & Kegeles, 1991; Santrock, 1990). Boyer & Kegeles (1991) explain that many adolescents perceive themselves to be invulnerable to disease and, as such, engage in risk-taking behaviours that may result in negative health outcomes. Further, Radius, Dillman, Becker, Rosenstock and Horvath, (1980) comment that "adolescents typically do not relate their behavior (in particular, their use of alcohol) to negative health outcomes, and that youths' levels of concern about personal health, about becoming sick, and so forth are predictably linked to their performance of certain

less-desirable behaviours” (p. 383). Melton (1988) suggests that perceptions of “lack of control” are common to youth and serve as obstacles to engaging in preventive behaviours. Santrock (1990) adds that adolescents “possess a time perspective that looks toward the future as having no boundaries, leading them to think they can live forever and recoup any lost health or modify any bad habits they might develop” (p. 580). Given this combination of attitudes it is not surprising that so many adolescents demonstrate poor health habits.

Health-related attitudes and beliefs are important determinants of health behaviour. Perceptions of control, self-efficacy, and vulnerability to illness influence personal health decisions. However, many adolescents feel invulnerable to disease and do not accurately perceive the relationship between risk-taking behaviour and health status. If one hopes to influence health-related behaviour, such underlying attitudes cannot be overlooked. Through greater awareness of adolescent attitudes, programs may be designed to increase perceptions of control and personal susceptibility, and to motivate health concern (Radius et al., 1980).

Summary

Health risk-taking behaviours are key determinants of adolescent health status. Such behaviours rarely occur in isolation. Individuals who use alcohol and drugs are more likely to engage in a variety of other risky behaviours. Such behaviours influence not only physical health status, but academic performance, mental and emotional health, and interpersonal relationships. Family characteristics and parental modelling may influence the development and maintenance of health attitudes and behaviours, and thus

are important to consider in attempts to modify such behaviour. Finally, pervasive attitudes of invulnerability to illness and lack of control serve to increase the likelihood of adolescent engagement in risk-taking behaviour. Effective health education programs recognize the inter-relationships among behaviours, and address the familial and attitudinal variables influencing such behaviours.

Health Locus of Control

One of the goals of CSH programming is to positively influence HLOC, thereby increasing perceptions of control over and responsibility for health on the part of participants. As research has shown this to be a particularly important variable for understanding individuals' health-related decisions and has documented the utility of targetting HLOC within CSH programs, this variable will be explored in detail in the following sections.

HLOC refers to perceptions or expectations regarding the source of control over one's health. In other words, it is the degree to which individuals perceive of their health as contingent upon their own actions as opposed to external forces. Individuals with an external HLOC attribute control for their health to fate, chance, or "powerful others" such as medical professionals, whereas internals attribute such control to their own behaviour.

The concept of HLOC is derived from Rotter's social learning theory and his original conception of the more generalized locus of control construct (Gochman, 1988; Wallston, 1992). The concept has been applied to the area of health for over 30 years, with much of the early work utilizing instruments based on Rotter's general Locus of

Control scale (Gochman, 1988). However, a number of health-specific measures of the construct have been developed (Lau & Ware, 1981; Wallston, Wallston, Kaplan & Maides, 1976; Wallston, Wallston & DeVellis, 1978), based on the view that while the prediction of generalized behaviour is amenable to general measures of expectancy, more specific predictions (i.e., health outcomes/behaviours as opposed to life outcomes) require specific measures of locus of control (Thompson, 1992). Such measures are based on Rotter's premise that "when the individual has experience with a given situation, situationally specific expectancies were more likely to predict behaviors specific to that situation than were generalized expectancies" (Rotter, 1975), and were developed to increase the predictability of the locus of control construct in health-related situations (Wallston, 1992).

Measurement of HLOC and Scale Development

There is disagreement among researchers as to the dimensionality of HLOC beliefs. HLOC has been conceptualized as consisting of one, two and three dimensions, and scales consistent with each of these conceptualizations have been developed. Results of factor analyses are equivocal as to the exact factor structure of HLOC.

The first health-specific locus of control scale consistent with Rotter's theory was the Health Locus of Control (HLC) Scale developed by Wallston et al. (1976). A unidimensional scale, it viewed HLOC as a single factor, or continuum, with internal and external expectancies lying at opposite ends. Early studies utilizing this health-related measure of generalized expectancy found it to be more predictive of certain health-related behaviours than the more generalized Internal - External scale (Wallston, 1992).

However, the unidimensionality of the locus of control concept has been questioned. Based on work with the generalized locus of control concept (Wallston & Wallston, 1981) it appeared that at least two health locus of control dimensions or factors existed and these factors were thought to be orthogonal (Wallston & Wallston, 1981; Wallston, 1992). As a result, the HLC scale protocols were rescored to form two subscales: HLC-I and HLC-E. According to this conceptualization, individuals may hold both internal and external beliefs simultaneously.

In addition, multidimensional health locus of control scales have been developed (Wallston, Wallston, & DeVellis, 1978; Lau & Ware, 1981) which split the external dimension into two separate factors: chance and control by powerful others. The most frequently used measure is the Multidimensional Health Locus of Control (MHLC) Scale (Wallston & Wallston, 1978) consisting of three six-item scales: Internal HLC, Powerful Others HLC, and Chance HLC. The three dimensions are held to be independent, and Wallston & Wallston (1982) caution that “low scores on the IHLC Scale do not mean that individuals believe that external factors determine their health; all that can be said about low IHLC scores is that they are not indicative of internal beliefs” (p.69). The two external scales are treated as separate measures of health locus of control beliefs.

Wallston & Wallston (1981) provide normative data on the HLC scale and the MHLC scale applied to various populations. Generally, the most internal groups are samples evidencing preventive health behaviours, i.e. birth control users and smoking reduction participants, undergraduates, and healthy middle-to-upper class adults. The most external groups are patients with chronic diseases and persons of lower SES. Lau

(1988) reporting on the normative data for the Lau-Ware HLC scale found similar results: nonsmokers and people who have been able to quit smoking are more internal than smokers; people at a health fair are more internal than the general population; birth control users and women who have chosen abortion are more internal than unmarried pregnant women.

Summary. There remains considerable debate as to the factor structure of HLOC beliefs. Most researchers agree that HLOC is composed of at least two dimensions, internal and external HLOC. However, many assert that the external dimension is actually composed of two independent factors, Chance HLOC and Powerful Others HLOC. Research with the MHLC scale tends to support a three-factor structure (Cooper & Fraboni, 1990; Eachus, 1990; Russell & Ludenia, 1983; Thompson, Gustafson, Hamlet, & Spock, 1992; Wall, Hinrichsen, & Pollack, 1989). Others, utilizing the Lau-Ware HLOC scale, support a two factor structure, composed of one internal and one external dimension (Quadrel & Lau, 1989). Further research is required to illuminate the exact nature of the relationship between various subscales.

HLOC and Related Factors

Theoretically, it is expected that “internals, in contrast to externals, would be more sensitive to health messages, would have increased knowledge about health conditions, would attempt to improve physical functioning, and might even, through their own efforts, be less susceptible to physical and psychological dysfunction” (Strickland, 1978, p.1193). Reviews of research with the health locus of control concept have found internal beliefs to be linked to the performance of a variety of preventive health

behaviours: seat belt use, exercise, inoculation, contraceptive use, preventive dental care, ability to lose weight and quit smoking. Internal HLOC has also been linked to the tendency to seek more information about disease and have generally higher levels of health knowledge (Kist-Kline & Lipnickey, 1989; Lau, 1988; Noland, Riggs & Hall, 1985; Riggs & Noland, 1984; Strickland, 1978; Wallston & Wallston, 1981). Parcel et al. (1980) report that numerous studies have shown external HLOC in children and adolescents to be correlated with such health related problems as emotional disturbance, delinquency, school behaviour problems and pre-marital pregnancy. Though many of these findings have been difficult to replicate, Strickland (1978) concludes that, "With some exceptions, the bulk of the reported research on I-E and precautionary health practices lends credence to the expected theoretical assumptions that individuals who hold internal as opposed to external expectancies are more likely to assume responsibility for their health. Internals appear to attempt to maintain their physical well-being and to guard against accidents and disease to a greater extent than individuals who hold external expectancies..." (p. 1195).

HLOC, health knowledge, health behaviour, and health status are interrelated (Noland, Riggs & Hall, 1985; Riggs & Noland, 1984). Studies suggest that internals report more positive health status, seek more health-related information than externals, and know more about their health conditions (Noland et al., 1985; Wallston & Wallston, 1981). HLOC has also been linked to substance use and risk-taking behaviour. These factors have been investigated in several studies dealing with both adult and adolescent populations and will be reviewed in the following sections.

Health Status. Research indicates that internal adolescents (Kellerman, 1980; Parcel et al. 1980) and adults (Seeman & Seeman, 1983) are healthier than their external counterparts. Internal adolescents who value health are less likely to report frequent illness or susceptibility to illness (Parcel et al., 1980). Similarly, Schwarzer, Jerusalem and Kleine (1990) found a moderate, positive correlation between external HLOC and adolescent health complaints. Kellerman (1980) found significant differences between chronically ill and healthy groups of adolescents. Ill adolescents' scores were significantly more external than those of their healthy peers. Similar results are reported for adults. Seeman & Seeman (1983) found a significant association between internal HLOC and positive self-rated health. In addition, they found that externals experience illness more frequently and for a longer duration than internals.

Health Knowledge and Health Protective Behaviour. Research suggests that high internals and / or low externals are more likely to engage in health protective behaviour, tend to view such behaviour as beneficial, and are more knowledgeable about their health. Zindler-Wernet and Weiss (1987) found that adults with a history of preventive health participation had significantly lower external HLOC and, compared to a normative sample of adults, subjects seeking a comprehensive appraisal of their health had significantly lower external scores and significantly higher internal scores. Similar results are reported in a study of adults undergoing comprehensive health examinations (Lau, 1988). Subjects scoring above the mean on the internal scale scored significantly higher on general measures of health behaviour, knowledge of health problems, and health plans than those scoring below the mean. Further, several studies have identified a

significant relationship between an internal HLOC and the practice of breast self-examination (BSE). Among women who value their health highly, internal beliefs positively correlate with the practice of BSE (Lau, 1988; Wallston et al., 1982).

Among children and adolescents, internal HLOC has been found to correlate with the ability to delay gratification in order to make appropriate judgments and gain greater rewards, with higher levels of health knowledge, and with beliefs as to the benefits of preventive health behaviour (Eiser et al., 1989). Investigating HLOC as a determinant of health beliefs, Eiser et al. (1989), found that adolescents higher in Personal Control (internal) regarded positive health habits as more beneficial. External (chance) HLOC was negatively related to endorsement of the positive benefits of numerous health behaviours, including those involving obedience and avoidance (i.e., healthy eating, not worrying, exercising, doing as you are told), and positively related to avoidance behaviours. Riggs & Noland (1984) found significant HLOC differences among a sample of disadvantaged adolescents. Those individuals classified as internals achieved higher knowledge scores than externals on items relating to fitness, smoking, dental health, disease, alcohol use, and nutrition.

Substance Use. Previous findings with regard to health behaviours and beliefs lend credence to the hypothesis that individuals who choose to indulge in substance use behaviours are more likely to adopt beliefs in chance health outcomes over beliefs in the effectiveness of personal or Internal control (Eiser et al., 1989). Given the threat posed by such behaviours to one's health, it follows that individuals who take responsibility for their health would likely limit their use of cigarettes, alcohol and drugs. Research with

adult and adolescent populations, particularly in the area of smoking behaviour, appears to support this assumption.

In a study of the correlates of adolescent substance use, Dielman, Campanelli, Shope, & Butchart (1987) found that internal locus of control significantly and negatively correlated with substance use, misuse and intention items. Jacobson (1989) describes an overall tendency toward an external orientation among substance using adolescents. Similar results are reported by Eiser et al. (1989) in relation to health beliefs and adolescent smoking. Smokers, compared to non-smokers, favoured HLOC beliefs concerned with chance to a greater extent than non-smokers, and were less in favour of beliefs in personal control and powerful others. The authors assert that "Such an early bias in beliefs may have implications for health education aimed at reducing smoking among adolescents. Beliefs in 'chance' health outcomes as opposed to 'powerful others' and 'personal control' may well limit the persuasive power of messages about the potential harm of cigarette smoking ... If harmful consequences are viewed as relatively more dependent on chance and less under personal control, then the arguments for refraining from smoking will be seen as less convincing" (p. 1064).

In contrast to the above findings, Dielman et al. (1984) found that adolescents higher on internal HLOC showed a slightly greater tendency to have used alcohol. The authors conclude that internal control adolescents who see less control by powerful others (i.e., show less dependence on adults for their health) are significantly more likely to use alcohol and drugs and to report intentions to do so in the future. It is apparent that further research is necessary in order to reliably demonstrate the relationship of HLOC to

substance use behaviour among adolescents.

Research in the area of adult smoking behaviour, including abstinence, cessation and relapse, has produced some of the most significant findings with regard to HLOC. Kaplan & Cowles (1978) and Wildman, Rosenbaum, Framer, Keane, & Johnson (1979 in Wallston et al., 1981) found that HLOC internals reduced cigarette consumption and maintained this reduction to a greater extent than subjects with an external HLOC. Shipley (1981) examined maintenance of abstinence following treatment, and found it to be enhanced by internal HLOC and hampered by external (chance) HLOC; subjects high on the internal scale and subjects low on the chance scale were more often abstinent. Horwitz, Hindi-Alexander & Wagner (1985) found that internal beliefs discriminated among ex-smokers, recidivists, and continuing smokers who participated in treatment for smoking cessation. Recidivists had significantly lower internal scores at follow-up than ex-smokers and perceived their health as most contingent on chance and powerful others, while ex-smokers perceived their health as least contingent upon these factors. These findings demonstrate that individuals who take responsibility for their health are more likely to be successful in achieving and maintaining abstinence from cigarettes.

Research is limited as to the role of HLOC in relation to adult alcohol and drug use. The majority of studies investigate alcoholic populations, and few consider alcohol or drug use among a normative sample of adults. Examining the relationship between HLOC and the initiation of recommended preventive health behaviours, Zindler-Wernet & Weiss (1987) found significant differences in External (chance) HLOC with regard to decreased alcohol use; subjects who decreased their use of alcohol in response to

recommendations demonstrated significantly lower chance HLOC scores. Fleming & Barry (1991) found that alcoholics with a family history of alcoholism had significantly higher External HLOC scores than nonalcoholics with a family history of alcoholism. However, Lau (1988) failed to find a significant correlation between HLOC and substance use (drinking and smoking) behaviour among adults. Further, in a study investigating the relationship of HLOC to treatment outcomes with adult alcoholics, Dean & Edwards (1990) found that, contrary to expectations, this population reflected a higher belief that their health status was more under their own control (internal - 49%) than under the control of external factors such as chance (29.8%) or powerful others (21.3%). However, individuals with an external (chance) orientation indicated an earlier onset of heavy drinking and research indicates that externally oriented alcoholics experience greater levels of psychological distress including feelings of helplessness, depression and isolation (Jacobson, 1989).

Results indicate that internal HLOC is associated with non-smoking and the ability to achieve abstinence. However, findings are equivocal with regards to HLOC and alcohol / drug use. The limited research, conducted mainly with adult alcoholic populations, has not demonstrated a clear relationship.

Risk-taking. Among the many factors which interfere with adolescent development and contribute to health problems, risk-taking “a characteristic endemic to this age group” is viewed as a primary cause of illness and death (Whatley, 1991). As such, it is an important area for research into the antecedents and determinants of health behaviour. Few studies have investigated the relationship between HLOC and risk-taking

behaviour in adults and adolescents, despite the fact that such behaviours, with particular reference to alcohol-related motor vehicle accidents and reckless driving, are major causes of morbidity, mortality and financial loss in North America (Smith & Remington, 1989).

Whatley (1991) examined the relationship of HLOC and social network on adolescent risk-taking and willingness to approach risky situations. Results indicated that of the factors investigated, HLOC accounted for a greater proportion of the variance in behaviour, although the percentage was small (12%). Interestingly, Chance HLOC did not contribute to risk-taking in this sample; most of the variance was accounted for by Powerful Others HLOC. In attempting to explain this finding, the authors suggest that if adolescents believe that other people are responsible for their health, and do not view their health as a personal responsibility, then perhaps they are more willing to approach risks. Further, such willingness to take risks may reflect the belief that other people will take care of them regardless of the outcome of their behavior. In contrast to Whatley's findings, a study by Desmond, Price & O'Connell (1985) failed to find a significant relationship between HLOC and the use of seat belts among high school students. It is evident that more work in this area is necessary to gain a clearer picture of the factors involved. Particularly important are studies investigating a broad range of risk-taking behaviours.

Among adults, results of preliminary research suggest that HLOC may play a role in risk-taking behaviour, however the exact nature of the relationship has not been reliably demonstrated. Ferguson (1989) found a significant negative correlation between

“impulsive” risk-taking, which is defined as “behaving without thought and being ‘carried away’” (p. 11), and internal HLOC among adults. Conway (1992) investigated HLOC and personality factors as correlates of four dimensions of health behaviour: Wellness behaviours, Accident Control, Traffic Risk taking, and Substance Risk-taking. Significant correlations were found between Internal HLOC and Chance HLOC and the five personality factors, and both personality and HLOC were independently associated with the health behaviour scales. HLOC accounted for a significant amount of the variance in the health behaviour scales independent of personality. Further, Powerful Others and Chance HLOC were found to be significant predictors of all four health behaviour scales.

Results of limited research are ambiguous regarding the role that HLOC plays in risk-taking behaviours among adolescents. Research with adults appears to support the assumption that internals are less likely to engage in risky behaviours, however the exact nature of the relationship has not at present been reliably demonstrated. Further research, particularly with adolescents, investigating a broad range of risk-taking behaviours is required.

Contradictory findings. Although much of the literature supports the hypothesis that high internal and/or low external HLOC are related to health-promoting behaviours, support is not universal. The research to date is fraught with contradiction, and in their reviews of HLOC research, Wallston & Wallston (1981, 1982) paint a less than unified picture of the relationship between HLOC and preventative health behaviour. They assert that, with the exception of studies on smoking reduction and breast self-

examination, research correlating HLOC beliefs with measures of behaviors carried out to maintain or enhance health has produced few significant relationships.

Such inconsistencies may be due to a variety of factors including methodological issues such as the use of many different kinds of locus of control measures (Lau, 1988). In addition, investigators point to the multifaceted nature of health-related behaviour and the discrepancy that often exists between beliefs and behaviours (Kist-Kline & Lipnickey, 1989; Lau, 1988; Wallston & Wallston, 1982; Zindler-Wernot & Weiss, 1987). Strickland explains that the I-E variable “is only one of a number of complex factors that may converge to predict health attitudes and behaviors” (Strickland, 1978, p. 1204). Other specific and generalized expectancies “as well as situational contingencies would also be expected to interact with what is likely a complex relationship between I-E and precautionary health practices” (Strickland, 1978, p. 1195). Lau (1988) posits that, particularly in a young population, health behaviours may at times be performed for reasons that have little to do with health, i.e., appearance, and thus concludes that one cannot expect a consistently high association between HLOC and the performance of a variety of health behaviours.

Wallston & Wallston (1982) assert that “preventive health behaviors are multidetermined, and it is simplistic to believe that any single construct such as locus of control will predict much of the variance in individual health behaviors....It is also quite likely that many people believe one thing but behave quite differently when it comes to protecting their health...” (p. 79). They suggest that HLOC beliefs may perhaps make better predictors of broad behavioral indices, “summed over a variety of health

behaviors, thus taking into account different behavioral expressions of the same attitude or expectancy” (p. 79). Zindler-Wernet & Weiss (1987) echo this sentiment and caution that expectancies regarding locus of control should not be considered in isolation from “important environmental and experiential variables when attempting to understand an individual’s decision to initiate recommended preventive health behavior” (p. 171). Such variables or factors include health value (Kist-Kline & Lipnickey, 1989; Lau, 1986, 1988; Wallston & Wallston, 1982); education (Kist-Kline & Lipnickey, 1989); socio-economic status (Kist-Kline & Lipnickey, 1989; Riggs & Noland, 1984) and generalized self-efficacy or personal competence (Pender et al., 1990; Wallston, 1992). These conclusions, however, are drawn exclusively from research with adults, and thus may not be applicable to adolescent populations.

Summary. Research suggests that adolescents and adults with an internal HLOC report a more positive physical health status, are more knowledgeable about their health and the effects of certain behaviours on their health status, and are more likely to engage in health protective behaviour. HLOC has also been linked to the propensity to use and abuse substances, although the majority of studies utilize adult populations. Internal HLOC is associated with non-smoking and the ability to achieve and maintain abstinence; results are equivocal with regard to alcohol and drug use. Few studies have investigated the influence of HLOC on risk-taking behaviours. Limited results appear to support a relationship between externality and risk-taking among adults. Among adolescents, findings have been contradictory and further research is necessary in order to determine the nature of the relationship with HLOC.

The Development of Health Locus of Control Beliefs

Despite the evidence identifying HLOC as an important determinant of health beliefs and behaviours, little attention has been paid to identifying factors which contribute to particular locus of control orientations (Eiser et al., 1989). Exceptions are reports by Tolar (1978), DeVellis et al. (1980), and Lau (1982; 1988). Rotter (1975), speaking of general locus of control, has suggested that these beliefs develop from specific experiences and past reinforcement history. Indeed, Tolar (1978) found that early and repeated experience of illness and injury were subsequently associated with more external beliefs in women, and DeVellis et al. (1980) found earlier onset and increased years of seizures in epileptics to be associated with increased external HLOC beliefs. Further, research has suggested that an internal HLOC is associated with family characteristics and parenting styles such as nurturant and accepting parenting, consistent discipline, and socioeconomic status (Lau, 1982; Sue & Sue, 1990).

Lau (1982) investigated a model of long-term and short-term HLOC beliefs, in which Early Health Habits re: self-care, Early Health Habits re: utilization of medical professionals, and Early Sickness Experience interact to determine beliefs in personal, chance and powerful others control of health. Results indicated that beliefs in Self-Control over health (Internal HLOC) were positively related to early health habits involving practice of self-care and visits to medical professionals and negatively related to early sickness experiences. Beliefs in Provider Control Over Health (PO) were positively related to early health habits involving medical professionals and negatively related to prior sickness experiences in the family. Such prior sickness experiences were

positively related to beliefs in Chance Health Outcomes. Stability coefficients of the HLOC constructs across time were all positive and high, indicating that “recent experiences with illness did not affect HLOC beliefs. This finding is consistent with the conceptualization of health locus of control as a fairly stable, individual difference measure” (p. 328).

Lau concludes that his findings “point out the importance to parents of making sure that their children practice good health habits...including regular visits to medical professionals for check-ups and vaccinations...” (p. 333), and the importance of further research on how to weaken the effect of prior illness experiences. A similar conclusion was reached by Parcel et al. (1980) who discuss the importance of parental influences such as promoting contingency learning, responding appropriately to avoidance, and early training for independence.

A later study by Lau (1988) replicated and extended his earlier work. The study tested an altered model of the development and stability of HLOC beliefs, in which seven factors interact to form an individual’s present beliefs: Illness in Family, Child’s Illness Experience, Health Training by Parents, Parent’s HLOC beliefs, Attribution for getting sick, Sophomore’s recent illnesses, and Freshman’s HLOC beliefs. In contrast to the earlier study, paths from past illness experiences and health training by parents were not statistically significant. However, “One important source of young adult’s health locus of control beliefs that was consistently identified by the models was their parent’s health locus of control beliefs” (p. 58). Further research is required in which the relationship identified above is explored.

Investigations regarding the development of HLOC point to the importance of such factors as early health habits, past illness experience, parental modelling and parental HLOC beliefs. The latter, parental HLOC, appears to be a particularly important source of HLOC beliefs among young college-age adults (Lau, 1988). Such a finding has significant implications for health promotion/primary prevention programs that attempt to influence attitudes and behaviours, and highlights the essential role played by parental/familial factors in the development of such attitudes and beliefs. The relationship between adolescent and parental HLOC has not been investigated, however, given the above, it is reasonable to assume that the HLOC beliefs of adolescents may reflect those of their parents.

Implications for Health Education

“The potential impact of HLC on the adoption and maintenance of preventive health behaviors has been demonstrated. The significance, then, of assessing the HLC of participants in health education / health promotion programs cannot and should not be overlooked” (Kist-Kline & Lipnickey, 1989, p. 47). However, questions remain as to the implications for health promotion and education. Two approaches have been advocated by researchers and practitioners, though there is considerable debate as to which is the most viable strategy.

The more widely studied approach involves the attempt to alter HLOC, generally in the direction of internality (Arborerlius & Bremberg, 1988; Kist-Kline & Lipnickey, 1989; Wallston & Wallston, 1982), within the context of a comprehensive health education program. Such an approach is based on the belief that individuals with an

internal HLOC are more apt to practice health-promoting behaviours and avoid practices detrimental to health. Some successes have been documented (Parcel et al., 1980; Wallston & Wallston, 1982; Kist-Kline & Lipnickey, 1989) and further research may show this to be a fruitful area, particularly with children whose beliefs have not yet fully developed and thus are perhaps more amenable to alteration.

An alternative approach involves the design of behavioural change programs to “fit” participants’ particular locus of control beliefs; it is suggested that such a “matching” approach will increase the effectiveness of programs and a growing body of research supports this hypothesis (Kist-Kline & Lipnickey, 1989; Lau, 1988; Pender et al., 1990; Quadrel & Lau, 1989; Riggs & Noland, 1984; Wallston & Wallston, 1982). Kist-Kline & Lipnickey (1989) assert that “methods oriented to an individual’s generalized expectancies will be more satisfying and successful than those not consistent with HLC beliefs. Program design for internals should provide more choice of treatments for the individual whereas externally oriented programs might emphasize the use of social support systems” (p. 43). With children and adolescents who are internal, health instruction should emphasize decision-making skills and provide opportunities to take responsibility for one’s own health. For students who are external and have beliefs in powerful others, an attempt might be made to involve a peer, parent, school nurse, or teacher in the learning process and in attempts to change health behavior. Such students are more likely to affiliate themselves with structured programs under the direction of “powerful others” (Pender et al., 1990; Jacobson, 1989). For students holding strong beliefs that health and health behavior are controlled by chance or luck, it might be

useful to plan for certain health behaviors rather than leaving these behaviors to chance (Riggs & Noland, 1988). Lau (1988) has declared this one of the most promising avenues for HLOC research, and documents its potential usefulness in a variety of settings and programs, including health promotion, intervention, and the design of media health campaigns.

Summary

Research with the HLOC construct has shown it to be an important variable in the adoption of preventive health behaviours and the reduction of health threatening behaviours. As a result, CSH programs aim to influence HLOC in the direction of internality, thereby increasing the perceptions of control and responsibility for health among participants. Internal HLOC has been linked to a more positive physical health status, greater levels of health-related knowledge, engaging in health protective behaviour, and refraining from smoking. Limited research, conducted primarily with adult populations, has produced equivocal results with regard to alcohol / drug use and risk-taking behaviour (although with regards to the latter, preliminary findings support a positive association to externality). Findings regarding the antecedents of HLOC beliefs points to the importance of parental modelling of healthy behaviour and parental HLOC. Such findings reinforce the need to involve families and communities in health education in order to facilitate environments conducive to good health. However, the findings to date are based on the results of retrospective studies with college-age adults. Research investigating the relationship between the HLOC beliefs of adolescents and their parents is required in order to reinforce the above findings.

Chapter Summary

The trend towards comprehensive school health education is based upon a recognition of the pivotal role of health behaviour as a key determinant of present and future health status. It requires a broader conceptualization of the factors influencing health and a consideration of the relationship between knowledge, skills, beliefs and behaviour. CSH aims to influence health-related behaviours and beliefs, and foster a sense of personal responsibility for health. Such programs encourage the collaboration of schools, families, and communities in the attempt to create and support healthy environments which model and reinforce healthy behavioural choices among youth. The importance of such collaboration is reinforced by research findings regarding the influence of parental modelling and family characteristics on the health-related behaviour and beliefs of adolescents.

Recognizing that behaviours are influenced by a variety of attitudinal variables, CSH programs aim to influence perceptions of susceptibility, control, and responsibility for health among participants. Given that many adolescents are prone to feelings of invulnerability to illness and lack of personal control, such attention to attitudes and beliefs is essential.

One such variable is HLOC and a review of the literature highlights the importance of considering and assessing an individual's HLOC beliefs within the context of comprehensive health programming. Research has demonstrated the link between HLOC and physical health status, health knowledge and protective behaviour, and smoking behaviour. However, results pertaining to alcohol and drug use are equivocal,

and there remains a paucity of research with regards to HLOC and other risk-taking behaviours, particularly among adolescents. Limited research with young adults suggests a positive relationship between parental and child HLOC. This is in line with other findings relating adolescent substance use / risk-taking beliefs to parental modelling and family characteristics and reinforces the need to consider parental variables within health education and promotion.

This chapter summarized the literature concerning the concept, goals and components of CSH, and discussed the role of health behaviour, familial influence, and health beliefs as key factors influencing health. This was followed by an integration of the HLOC literature pertaining to adolescents and adults with an emphasis on health status, substance use, and risk-taking behaviour.

The Current Study

The purpose of the present study was to further explore HLOC with regards to physical health status and substance use / risk-taking beliefs and behaviour. In doing so, an attempt was made to address discrepancies within the literature. As such, the present study utilized both adult and adolescent populations and considered a broad range of substance use and risk-taking beliefs and behaviours.

Research Questions

The purpose of this study is to investigate HLOC with an emphasis on risk-taking attitudes and behaviours, and to consider possible relationships between parental and child HLOC. As such, the following questions are addressed:

1. How do adolescents with an internal health locus of control compare to adolescents with an external health locus of control in terms of health status and attitudes and behaviours re: substance use / risk-taking?

2. How do adults with an internal health locus of control compare to adolescents with an external health locus of control in terms of health status and attitudes and behaviours re: substance use / risk-taking?

3a. What is the relationship between adolescents' HLOC, physical health status , and substance use / risk-taking?

b. What is the the relationship between adolescents' health-related beliefs and behaviours?

4a. What is the relationship between adults' HLOC, physical health status , and substance use / risk-taking?

b. What is the the relationship between adults' health-related beliefs and behaviours?

5. What is the relationship between parent and child HLOC?

Chapter 3

Method

The current study was part of a Comprehensive School Health partnership between the Calgary Board of Education, Calgary Health Services, the University of Calgary, and the Kahanoff Foundation aimed at developing a model for, implementing, and evaluating Comprehensive School Health programs in six Calgary secondary schools. The selection of subjects, procedures for data collection, and questionnaire format were determined by the larger project.

Research Participants and Method of Data Collection

Participants for this study included students, parents, and personnel from two Calgary secondary schools. A total of 564 students, 268 parents and 87 staff members participated in the study. (See Tables 1, 2, & 3.)

The adolescent participants were School 1 students in grades 10 through 12 classes, and School 2 students in grades 9 through 12 classes, who attended school on the day of administration and consented to participate. Surveys were administered by classroom teachers and completed during class time. Each class list was divided in two; one half of the students in each class completed a Needs Survey while the other half completed a Health Impact survey. The latter instrument provided the data for this investigation.

Participating students were then provided with a survey and cover letter to take home to their parents. Parents completed either a Needs or Health Impact survey depending on the type of survey completed by their children. Parents were asked to

return the completed surveys in a sealed envelope to the school.

All school personnel were invited to participate, including instructional, support and administrative staff. Surveys were distributed to personnel, completed at their convenience, and returned to the school administration.

Students. School 1 provided approximately two thirds of the total student sample. (See Table 1). The mean age in School 1 was 16.0 years. The mean age in school 2 was 15.7 years.

Results of three chi square analyses indicated that the demographic composition of the students in each school differed significantly. A school by age analysis indicated that the proportion of students at various ages differed between schools, $\chi^2 (1, N = 561) = 15.01, p < .01$. A school by grade analysis also revealed significant differences between the two schools in terms of the proportion of students enrolled in each grade level: $\chi^2 (1, N = 561) = 108.55, p < .01$. Finally, a school by gender analysis found marginally significant differences in the proportions of male and female participants: $\chi^2 (1, N = 562) = 3.57, p = .06$.

Parents. School 1 parents comprised 83% of the parent sample, and participants were predominantly married females. Table 2 presents the distribution of the parent group according to gender and marital status. The results of several chi square analyses do not suggest any significant differences between schools in the demographic composition of the parent sample in terms of gender $\chi^2 (1, N = 263) = .02, p = .90$, or marital status $(1, N = 262) = .267, p = .61$.

Table 1

Distribution of Students by School, Gender and Age

Age	School 1			School 2			Total Sample
	Female	Male	Total	Female	Male	Total	
14	13 (3.7)	9 (2.5)	22 (6.2)	24 (11.7)	26 (12.6)	50 (24.3)	72 (12.8)
15	49 (13.8)	45 (12.7)	94 (26.5)	22 (10.7)	28 (13.6)	50 (24.3)	144 (25.7)
16	64 (18.1)	41 (10.6)	105 (29.7)	24 (11.7)	21 (10.2)	45 (21.9)	150 (26.8)
17	51 (14.4)	49 (13.8)	100 (28.2)	18 (8.7)	25 (12.1)	43 (20.8)	143 (25.5)
18	19 (5.4)	13 (3.7)	32 (9.1)	8 (0.9)	7 (3.4)	15 (4.3)	47 (8.4)
19	0 (0.0)	1 (0.3)	1 (0.3)	0 (0.0)	1 (0.5)	1 (0.5)	2 (0.4)
20	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.5)	1 (0.5)	2 (1.0)	2 (0.4)
Total	196 (55.4)	158 (44.6)	354 (100.0)	97 (47.1)	109 (52.9)	206 (100.0)	560 (100.0)

Note: Data missing for four students
(numbers in parentheses are percentages)

Table 2

Distribution of Parents by Marital Status and Gender

Marital Status	School 1			School 2			Total
	Female	Male	Total	Female	Male	Total	
Single	5 (2.3)	0 (0.0)	5 (2.3)	4 (9.8)	0 (0.0)	4 (9.8)	9 (3.5)
Married	133 (61.0)	35 (16.1)	168 (77.1)	21 (51.2)	6 (14.6)	27 (65.8)	195 (75.3)
Divorced	27 (12.4)	4 (1.8)	31 (14.2)	9 (22.0)	0 (0.0)	9 (22.0)	40 (15.4)
Common Law	4 (1.8)	2 (0.9)	6 (2.7)	0 (0.0)	0 (0.0)	0 (0.0)	6 (2.3)
Separated	7 (3.2)	1 (0.5)	8 (3.7)	0 (0.0)	1 (2.4)	1 (2.4)	9 (3.5)
Total	176 (80.7)	42 (19.3)	218 (100.0)	34 (82.9)	7 (17.1)	41 (100)	259 (100)

Note: Data missing from nine parents
(Numbers in parentheses are percentages)

School Personnel. A total of 61 school personnel from school 1 and 26 from school 2 were included in the sample. The majority of these were instructional staff. The distribution of school personnel by position and gender is presented in Table 3. Note that staff were not asked to provide their marital status.

Results of chi square analyses revealed significant differences between school personnel samples in terms of position $\chi^2 (1, N = 85) = 6.65, p < .01$. However the gender proportions of the personnel samples did not differ significantly: $\chi^2 (1, N = 87) = 2.05, p = .15$.

Table 3

Distribution of School Personnel by Position and Gender

Position	School 1			School 2			Total
	Female	Male	Total	Female	Male	Total	
Instruction	24 (40.0)	33 (55.0)	57 (95.0)	11 (44.0)	8 (32.0)	19 (76.0)	76 (89.4)
Support	1 (1.7)	2 (3.3)	3 (5.0)	4 (16.0)	2 (8.0)	6 (24.0)	9 (10.6)
Total	25 (41.7)	35 (58.3)	60 (100)	15 (60.0)	10 (40.0)	25 (100)	85 (100)

Data missing for two personnel
(Numbers in parentheses are percentages)

Instrument

To assess the health-related beliefs, behaviours, and health locus of control (HLOC) of the sample, the Health Impact Survey (Collins, Hiebert, & Cairns, 1992) was employed (See Appendix A). This survey was constructed through a Delphi procedure for the Partners for Healthy Living project. See Collins (1992) for a detailed description of instrument development. Three specific scales from this instrument provided data for this investigation: the HLOC, Health Beliefs, and Health Behaviours scales. Principal Components Factor Analyses were conducted on these three scales using student, parent, and personnel responses from each school. The following will present a description of each scale and the factor analyses results.

HLOC Scale. The HLOC scale consists of 18 items pertaining to one's sense of control over and responsibility for health. Using a five point Likert scale, participants were asked to rate the degree to which they agreed or disagreed with each item.

Student, parent, and personnel responses on this scale were subjected to a Principal Components Factor Analysis. Based on previous research with the HLOC construct, both 2 factor (Quadrel & Lau, 1988) and 3 factor (Cooper & Fraboni, 1990; Eachus, 1990; Fleming & Barry, 1991; Russell & Ludenia, 1983; Wallston, Wallston, & Devillis, 1978) solutions were sought. The current analysis did not support a 3 factor solution, but did support a two factor solution. Factor I, External HLOC, accounted for 20.7 % of the variance, while Factor II, Internal HLOC, accounted for 9.5% of the variance. Factor I included questions reflecting beliefs in chance control over health in addition to beliefs in “powerful others” control. Factor II was comprised of questions reflecting personal control over health. A minimum factor loading of .25 was established in order for an item to be accepted in the analysis and all items met this criterion. Chronbach’s Alphas were calculated to determine the internal consistency of the subscales. Alphas for the External and Internal scales were .71 and .67 respectively. Table 4 presents the factor loadings for the HLOC scale on the rotated factor matrix.

Table 4

Factor Loadings for HLOC Scale on Rotated Factor Matrix *

Question	Factor I: External HLOC	Factor II: Internal HLOC
1. If I become sick, I have little power322*	-.307
2. I am in control of my own health	-.152	.563*
3. When things go wrong...it is rarely my own fault	.081	-.263*
4. The main thing which affects my health is ...myself	-.042	.590*
5. Even if I take care of myself it's hard to avoid illness	.298*	-.136
6. I can control the effect that stresses...have	-.056	.480*
7. Small changes in the way I live ...well-being	-.078	.650*
8. My lifestyle ...can affect my future health	-.092	.699*
9. There is a link between ...stress and becoming ill	-.107	.543*
10. People get sick because they are unlucky	.566*	-.196
11. Only the dentist can take care of my teeth	.494*	-.131
12. The only way I can stay healthy ...other people tell me	.678*	-.122
13. If I feel sick, I have to wait for other people to tell me...	.649*	-.153
14. No matter what I do, if I am going to get sick, I will...	.490*	-.195
15. Having regular contact with my physician...	.289*	.104
16. My family has a lot to do with my becoming sick...	.378*	.228
17. Luck plays a big part...	.646*	-.131
18. My good health ... matter of good fortune	.581*	-.153

* Items loading on a factor are indicated with an asterisc.

Health Beliefs Scale. To assess health-related attitudes, participants were presented with a list of 35 behaviours and asked to indicate the effect they believed each item had on healthy living. These beliefs were rated on a five point Likert scale, from 1 (Very bad for health) to 5 (Very good for health).

Again, responses were subjected to a Principal Components Factor Analysis, yielding 7 factors. The factors, their corresponding question numbers and alpha levels are presented in Table 5. Factor loadings are presented in Table 6. Items belonging to a given factor are indicated with an asterisc. Again, all items met the minimum .25 criterion and no items were eliminated due to weak loadings. Alpha's were calculated for each factor, and results indicate high levels of internal consistency.

Table 5

Factors of the Health Beliefs Scale

Factor	Question Number	% Variance	Alpha
I Mental Health	22, 25 - 35	31.0	.90
II Nutrition & Exercise	2, 4 - 7	7.9	.79
III Risk-Taking I: Risk-Taking & Substance Use	3, 10 - 12, 14, 16	5.1	.81
IV Risk-Taking II	13, 15, 17, 21	4.2	.78
V Safety	18 - 20	4.0	.83
VI Risk-Taking III: Junk Food & Alcohol	1, 8, 9	3.4	.62
VII Mental Health II: Pleasure	23, -24	2.9	
	Total	58.5	

Table 6

Factor Loadings for the Health Beliefs Scale on Rotated Factor Matrix

Question Number	I	II	III	IV	V	VI	VII
1.	-.091	-.256	.151	.168	-.044	.565*	.000
2.	.257	.487*	-.297	.157	.275	-.029	-.030
3.	-.170	-.075	.439*	.072	-.130	.286	-.010
4.	.213	.690*	-.070	-.108	.131	-.053	-.156
5.	.141	.660*	-.256	.018	.101	-.037	.066
6.	.229	.724*	-.053	-.126	.086	-.104	.131
7.	.138	.765*	-.020	-.143	.109	-.088	.128
8.	.025	.080	.102	-.060	-.095	.781*	-.082
9.	-.122	-.168	.360	.213	-.057	.648*	-.044
10.	-.135	-.091	.659*	.275	-.151	.214	.034
11.	-.142	-.166	.662*	.287	-.076	.295	.000
12.	-.166	-.217	.481*	.188	.163	.297	-.187
13.	-.188	-.134	.209	.737*	-.090	.124	-.001
14.	.029	-.149	.538*	.397	-.300	.051	-.272
15.	-.193	-.088	.203	.762*	-.084	.067	.018
16.	-.007	-.135	.542*	.452	-.197	-.049	-.276
17.	-.282	-.061	.260	.523*	-.321	.096	-.076
18.	.185	.142	-.144	-.177	.689*	-.082	.101
19.	.294	.230	-.091	-.183	.730*	-.114	.019
20.	.343	.242	-.170	-.190	.680*	-.025	.123
21.	-.327	.062	.228	.459*	-.255	.029	.049
22.	.650*	.086	-.299	-.062	.146	-.002	.006
23.	.235	.005	-.031	.200	.146	.004	.698*
24.	-.078	-.045	.092	.261	-.001	.178	-.676*
25.	.536*	.111	-.042	-.016	.371	-.217	.046
26.	.681*	.159	.016	-.199	.178	-.201	.151
27.	.434*	.135	.058	-.132	-.033	.239	.175
28.	.729*	.280	.004	-.236	.081	-.083	.129
29.	.716*	.324	.051	-.230	.102	-.073	.123
30.	.416*	.335	-.305	-.070	.261	.073	.264
31.	.617*	.167	.084	-.267	.124	-.148	-.015
32.	.466*	.249	-.218	.062	.089	.113	.394
33.	.725*	.074	-.339	-.029	.186	.011	.080
34.	.589*	.142	-.390	.052	.216	.032	.321
35.	.707*	.080	-.287	-.099	.131	-.072	-.056

Health Behaviours. The Health Behaviours scale consisted of 38 behaviour items. Questions were identical to those of the Health Beliefs Scale, with the addition of three items pertaining to peer pressure, following parental examples of healthy behaviour, and talking to a caring adult about health concerns. Participants were asked to rate on a five point Likert scale the frequency with which they engaged in each behaviour, ranging from 1 (Never or Rarely) to 5 (Daily). In order for the items to read properly, it was necessary to group the 38 behaviour items into three “question clusters” on the survey. However, to facilitate understanding of the following discussion, the tables are constructed so that the behaviour and belief items have corresponding question numbers.

Seven factors emerged from the Principal Components Factor Analysis. Again, all questions met the .25 criterion, and the factors demonstrated acceptable levels of internal consistency. See Table 7 for a summary of the factors, their corresponding questions, and alpha levels, and Table 8 for factor loadings.

Due to the item similarity of the beliefs and behaviours scales, a seven factor solution for the Health Behaviours scale was sought. However the factors that emerged were not identical to those of the Health Beliefs scale. As can be seen from the following tables, questions relating to risk-taking and substance use fell into four factors on the Beliefs scale, whereas they fell into three on the Behaviour scale¹. As the factors of the Health Behaviours scale were thematically “cleaner”, it was decided that these would serve in future analyses. Factors III (Risk-Taking I), IV (Risk-Taking II), and VI (Risk-

¹ Note that as the purpose of the current study was to investigate HLOC and Risk-taking beliefs and behaviours, only those factors relevant to this purpose are considered further.

Taking III) of the Health Beliefs scale were combined so as to form two new subscales. The revised sub-scales and alpha reliabilities for the beliefs scale are presented in Table 9 along with the corresponding behaviour subscales. As can be seen, alpha's for the two new beliefs subscales (Risk-Taking I & II) are slightly higher than those of the original factors. Thus for the purpose of the analyses presented in Chapter 4, three factors were selected: Risk-taking I, Risk-taking II, and Safety.

Table 7

Factors of the Behaviours Scale

Factor	Number	% Variance	Alpha
Mental Health I: Coping	22, 25, 26, 28, 29, 31, 35, 38	20.9	.84
Risk-Taking I: Risk-Taking & Substance Use	10, 13, 14, 15, 16, 17, 21, 36	9.9	.81
Risk-Taking II: Substance Use	3, 8, 9, 11, 12	7.1	.67
Safety	18, 19, 20	4.8	.62
Nutrition and Exercise	2, 4, 5, 6, 7	4.1	.71
Mental Health II: Self-Care	-24, 27, 30, 34	3.5	.58
Mental Health III: Social Support	23, 32, 33	3.4	.62
		53.6	

Table 8

Factor Loadings for Health Behaviours Scale on Rotated Factor Matrix

	Question Number	I	II	III	IV	V	VI	VII
1.	12-1	-.157	.245	-.006	.088	-.454	-.078	.320
2.	13-1	.202	-.116	-.130	.338	.341*	.260	.170
3.	13-2	-.047	.186	.303*	-.142	.006	-.494	.038
4.	13-3	.297	.092	-.053	.174	.566*	.043	.031
5.	13-4	.008	.156	-.256	.060	.486*	.148	.318
6.	13-5	.145	-.082	-.020	.121	.765*	.036	.055
7.	13-6	.184	-.066	-.005	.151	.809*	-.032	-.033
8.	12-2	-.010	.227	.729*	.050	.015	.030	-.006
9.	12-3	-.094	.391	.730*	-.116	-.041	.025	.060
10.	12-4	-.083	.557*	.477	-.141	-.027	.004	.023
11.	12-5	-.039	.059	.652*	-.257	-.168	-.099	.140
12.	13-7	.008	.164	.599*	.281	-.007	-.072	-.178
13.	13-12	-.114	.380*	.225	-.271	.052	-.035	.355
14.	13-13	.002	.796*	.166	.080	-.011	-.134	-.104
15.	12-6	-.225	.310*	.242	-.428	-.101	-.083	.440
16.	12-7	-.002	.695*	.329	-.043	-.120	-.139	-.014
17.	12-8	-.094	.765*	.013	-.164	.015	.034	.029
18.	13-9	.123	-.389	.017	.517*	.088	.028	.156
19.	13-10	.149	-.023	.033	.532*	.211	.085	-.139
20.	13-11	.180	-.248	.007	.641*	.218	.042	-.050
21.	13-17	-.141	.703*	.012	-.195	.028	.002	-.001
22.	12-9	.448*	-.076	-.034	.533	-.047	.111	.288
23.	12-10	.061	-.017	.016	.094	.019	.144	.719*
24.	12-11	-.108	.129	-.018	.064	-.023	-.732*	-.032
25.	14-1	.475*	-.093	-.062	.082	.077	.115	-.043
26.	14-2	.642*	-.153	-.001	.212	.292	.053	-.095
27.	13-18	.038	.107	.092	-.005	.017	.631*	.196
28.	14-4	.744*	-.070	.028	.048	.235	.206	-.004
29.	14-5	.681*	-.110	.003	.175	.262	.132	-.027
30.	13-8	.129	-.029	-.216	.343	.127	.540*	.028
31.	14-6	.656*	.062	.066	.032	.018	-.056	-.148
32.	13-14	-.055	-.053	-.018	-.076	-.054	.184	.693*
33.	13-15	.341	-.107	-.178	.405	-.036	.246	.478*
34.	13-16	.183	-.074	.034	.185	.118	.644*	.352
35.	14-7	.718*	-.159	-.092	.175	-.007	-.004	.176
36.	13-19	-.115	.559*	.260	-.012	-.087	.115	.206
37.	13-20	.282	.117	-.344	.402	.091	.115	.206
38.	14-3	.732*	-.054	-.170	.106	.131	.067	.145

Table 9

Health Behaviour and Revised Health Beliefs Subscales

Sub-scale	Beliefs	Alpha	Behaviour	Alpha
Risk-Taking I: Risk-taking & Substance Use	10, 13, 14,15, 16, 17, 21	.84	10, 13, 14, 15, 16, 17, 21, 36	.81
Risk-Taking II: Substance Use	3, 8, 9, 11, 12	.69	3, 8, 9, 11, 12	.67
Safety	18, 19, 20	.83	18, 19, 20	.62

Summary

Seven dependent measures were chosen for investigation in the current study. These included three factors from the Health Beliefs Scale: Risk-taking I, Risk-taking II (Substance Use), and Safety, and the corresponding factors on the Health Behaviours scale. The seventh dependent measure, Physical Health Status, consisted of one item on the Health Impact Survey. Subjects were asked to rate their general level of health (ranging from poor to excellent) using a 5 point Likert format.

Chapter 4

Results

The results of the study are presented in this chapter. Descriptive results are outlined first, followed by inferential results.

Descriptive Results

Tables 10 and 11 display the means and standard deviations for the dependent measures used in this study. As shown in Table 10, students from both schools attained relatively high internal and low external HLOC scores, suggesting a sense of control over, and responsibility for, health on the part of adolescents. The physical health status scores indicate that students consider themselves to be in good to very good health. Average scores for substance use and risk-taking beliefs indicate that students believe these behaviours to be “somewhat bad for health” and their behaviour scores correspond to this belief, mean scores falling between “never or rarely” and “once in a while”. Mean scores for beliefs about safety behaviours indicate that students view such behaviours as having a positive effect on healthy living, and the mean behaviour scores suggest that students engage in such behaviours “often”, although not most or all of the time.

The means and standard deviations for the adult groups are presented in Table 11. To test the similarity of the parent and school personnel samples, a group by HLOC chi square analysis was performed and results indicated no significant differences in the proportion of people with different HLOC's. Therefore a combined adult sample was used for all subsequent analyses and discussion. Average scores for Internal and External HLOC suggest that this group holds a strong belief in personal control over, and

responsibility for, health. Similar to adolescents, the adults rated their general physical health status between “good” and “very good”, and believed substance use behaviours to be “somewhat bad for health”. The mean scores for beliefs regarding risk-taking behaviours suggest a strong belief in the negative health effects of substance use and risky behaviours and in the positive effects of safety behaviours on the part of parents and school personnel. Behaviour scores correspond to such beliefs, indicating that adults engage in substance use behaviours “once in a while”, but rarely engage in risk-taking behaviours. Similar to adolescents, the mean score for safety beliefs fell between the “somewhat good for health” and “very good for health”. Their average behaviour scores suggest that they engage in such behaviours “most of the time”.

Table 10

Student Subscale Means and Standard Deviations (S.D.)

Scale	<u>School 1</u>		<u>School 2</u>	
	Mean	(S.D.)	Mean	(S.D.)
Internal HLOC	3.88	(.53)	3.98	(.50)
External HLOC	2.19	(.47)	2.20	(.47)
Physical Health Status	3.57	(.84)	3.66	(.92)
Health Beliefs:				
Substance Use	1.95	(.64)	1.88	(.70)
Risk-taking	1.87	(.67)	1.91	(.73)
Safety	4.27	(.78)	4.35	(.80)
Health Behaviours:				
Substance Use	1.89	(.86)	1.70	(.84)
Risk-taking	1.69	(.66)	1.65	(.65)
Safety	3.21	(1.03)	3.30	(1.04)

Table 11

Adult Subscale Means and Standard Deviations (S.D.)*

Scales	School 1			School 2		
	Parents	Staff	Adults	Parents	Staff	Adults
Internal HLOC	4.15 (.50)	4.24 (.44)	4.17 (.49)	4.18 (.64)	4.24 (.49)	4.20 (.59)
External HLOC	2.03 (.44)	2.01 (.44)	2.02 (.44)	2.09 (.51)	2.05 (.45)	2.08 (.48)
Physical Health Status	3.43 (.88)	3.68 (.85)	3.48 (.88)	3.64 (.92)	3.58 (.88)	3.62 (.90)
Health Beliefs:						
Substance Use	1.83 (.49)	1.86 (.44)	1.84 (.48)	1.88 (.64)	1.81 (.52)	1.85 (.60)
Risk-taking	1.27 (.35)	1.42 (.38)	1.30 (.36)	1.35 (.53)	1.42 (.48)	1.38 (.51)
Safety	4.66 (.33)	4.62 (.54)	4.65 (.51)	4.72 (.67)	4.74 (.47)	4.73 (.60)
Health Behaviours:						
Substance Use	1.93 (.70)	1.90 (.66)	1.92 (.69)	1.64 (.66)	1.94 (.67)	1.75 (.68)
Risk-taking	1.26 (.27)	1.32 (.19)	1.28 (.26)	1.23 (.33)	1.38 (.29)	1.29 (.32)
Safety	4.08 (.99)	4.16 (.83)	4.10 (.96)	3.85 (1.04)	4.09 (.76)	3.94 (.95)

* Standard deviations are given in parenthesis

Health Locus of Control

It was initially expected that subjects demonstrating high Internal subscale scores would also demonstrate low External subscale scores, and visa versa. Therefore, for the purpose of future analyses, it was decided that individuals would be first classified as either “Externals” or “Internals”. The External category would be composed of people who were high on the external subscale and low on the internal subscale, while the Internal category would include those individuals high on the internal subscale and low on the external subscale. Median splits were used in order to achieve such classification. Tables 12 and 13 display the frequency of individuals in categories of HLOC.

Table 12

Distribution of Students According to HLOC Subscale Scores

	Low External	High External
Low Internal	127	155
High Internal	181	101

Table 13

Distribution of Adults According to HLOC Subscale Scores

	Low External	High External
Low Internal	56	144
High Internal	95	58

Contrary to the initial expectations, 40% of adolescents and 38% of adults attained either high or low scores on both subscales. Therefore, a third category named “Contextual HLOC” was created for these individuals. It was hypothesized that individuals within this category use situational or contextual factors, not attributional style, in assessing their HLOC. Tables 14 and 15 present the frequency and percent of participants within the three categories of HLOC for each school and group. Mean HLOC subscale scores for individuals within these groups are presented in Tables 16 and 17.

Table 14

Frequency and Percent of Students in Categories of HLOC

HLOC	<u>School 1</u>		<u>School 2</u>		<u>Total</u>	
	Frequ.	%	Frequ.	%	Frequ.	%
Internal	111	(31.3)	70	(33.5)	181	(32.1)
External	104	(29.3)	51	(24.4)	155	(27.5)
Contextual	140	(39.4)	88	(42.1)	228	(40.4)
Total	355	(100.0)	209	(100.0)	564	(100.0)

Table 15

Frequency and Percent of Adults in Categories of HLOC

HLOC	<u>School 1</u>		<u>School 2</u>		<u>Total</u>	
	Frequ.	%	Frequ.	%	Frequ.	%
Internal	78	(27.8)	20	(27.8)	98	(27.8)
External	120	(42.7)	20	(27.8)	140	(39.7)
Contextual	83	(29.5)	32	(44.4)	115	(32.6)
Total	281	(100)	72	(100)	353	(100)

Table 16

Adolescent HLOC Scale Means for Categories of HLOC

Category	Subscale	School 1		School 2	
		<u>M</u>	(S.D.)	<u>M</u>	(S.D.)
External	EHLOC	2.56	(.23)	2.66	(.37)
	IHLOC	3.41	(.32)	3.54	(.31)
Internal	EHLOC	1.84	(.26)	1.89	(.26)
	IHLOC	4.34	(.30)	4.42	(.32)
Contextual	EHLOC	2.20	(.52)	2.18	(.42)
	IHLOC	3.86	(.47)	3.89	(.43)

Table 17

Adult HLOC Scale Means for Categories of HLOC

Category	Subscale	School 1		School 2	
		<u>M</u>	(S.D.)	<u>M</u>	(S.D.)
External	EHLOC	2.31	(.28)	2.46	(.44)
	IHLOC	3.89	(.30)	3.76	(.76)
Internal	EHLOC	1.57	(.25)	1.58	(.28)
	IHLOC	4.68	(.24)	4.70	(.29)
Contextual	EHLOC	1.97	(.42)	1.97	(.40)
	IHLOC	4.13	(.50)	4.17	(.43)

Inferential Results

Research Question One

The first research question asked how adolescents of different HLOC's (External, Internal, and Contextual) and schools compare in terms of the dependent measures: physical health status, substance use, risk-taking and safety. A two-way School by HLOC MANOVA was performed on the means of the dependent variables.

Significant Bartlett's were found for six of the seven dependent measures indicating a lack of homogeneity of variance. Outliers and extreme values were removed from the original data in an attempt to achieve nonsignificant Bartletts. However, two of the seven dependent measures remained significant (substance use and risk-taking beliefs) and continued attempts to reduce the significance of these measures compromised the other variables. Therefore, results obtained for these measures should be interpreted cautiously. The final sample consisted of 522 adolescents, 328 from School 1 and 194 from School 2. Table 18 shows the frequency and percent of students in each category of HLOC based on the revised data set.

A two way MANOVA was performed on the dependent measures with School and HLOC (External, Internal, Contextual) as the independent measures. No interaction effect was found. A significant main effect was found for school, $F(7, 493) = 2.13, p < .04$. Follow up univariate tests indicated significant effects for substance use beliefs and substance use behaviours. A significant main effect was also found for HLOC,

Table 18

Frequency and Percent of Students in Categories of HLOC (Final Data Set)

HLOC	<u>School 1</u>		<u>School 2</u>		<u>Total</u>	
	Frequ.	%	Frequ.	%	Frequ.	%
Internal	110	33.5	68	35.1	178	34.1
External	91	27.8	43	22.2	134	25.7
Contextual	127	38.7	83	42.8	210	40.2
Total	328		194		522	

$F(14, 984) = 5.57, p < .01$. Univariate tests indicated significant effects for all dependent measures except substance use behaviour. Post hoc Duncan Multiple Range Tests indicated that externals differed from both contextualls and internals on health status, substance use beliefs, risk-taking beliefs and behaviours, and safety beliefs and behaviours. No significant differences were found between internals and contextualls on these measures, except for Health Status. Tables 19 and 20 present the means, standard deviations and F ratios for the dependent measures.

Table 19

Adolescent Means And Standard Deviations as a Function of School and HLOC

Dependent Measure	School	HLOC							
		External		Internal		Contextual		Total	
		M	(S.D.)	M	(S.D.)	M	(S.D.)	M	(S.D.)
Health Status	School 1	3.27	(.91)	3.80	(.75)	3.55	(.80)	3.56	(.87)
	School 2	3.33	(.86)	3.88	(.79)	3.59	(.88)	3.64	(.84)
	Total	3.29	(.89)	3.83	(.76)	3.56	(.83)	3.59	(.85)
Sub. Use Beliefs	School 1	2.12	(.56)	1.77	(.42)	1.79	(.44)	1.87	(.49)
	School 2	1.94	(.58)	1.68	(.51)	1.75	(.46)	1.77	(.47)
	Total	2.06	(.57)	1.74	(.46)	1.78	(.45)	1.83	(.50)
Risk-taking Beliefs	School 1	1.98	(.54)	1.71	(.42)	1.68	(.42)	1.77	(.47)
	School 2	1.95	(.57)	1.70	(.42)	1.73	(.43)	1.77	(.47)
	Total	1.97	(.55)	1.71	(.42)	1.70	(.42)	1.77	(.47)
Safety Beliefs	School 1	4.18	(.62)	4.50	(.55)	4.41	(.61)	4.38	(.60)
	School 2	4.29	(.64)	4.54	(.49)	4.52	(.56)	4.48	(.56)
	Total	4.22	(.62)	4.52	(.59)	4.45	(.59)	4.42	(.59)
Sub. Use Behaviour	School 1	1.96	(.80)	1.70	(.71)	1.81	(.77)	1.81	(.76)
	School 2	1.71	(.82)	1.58	(.73)	1.59	(.67)	1.61	(.72)
	Total	1.88	(.81)	1.65	(.72)	1.72	(.74)	1.74	(.75)
Risk-taking Behaviour	School 1	1.74	(.50)	1.54	(.40)	1.51	(.39)	1.58	(.43)
	School 2	1.67	(.56)	1.56	(.43)	1.52	(.47)	1.57	(.48)
	Total	1.72	(.52)	1.55	(.41)	1.52	(.42)	1.58	(.45)
Safety Behaviour	School 1	3.03	(.98)	3.49	(.89)	3.28	(1.04)	3.28	(.99)
	School 2	3.07	(1.09)	3.52	(.84)	3.35	(1.04)	3.35	(.99)
	Total	3.04	(1.02)	3.50	(.87)	3.31	(1.04)	3.31	(.99)
Sample Size (n)	School 1	84		108		124		316	
	School 2	40		67		82		189	
	Total	124		175		206		505	

Table 20

Adolescent Univariate F's as a Function of School and HLOC

Dependent Measure	<u>School</u>	<u>HLOC</u>
	<u>F</u> (p)	<u>F</u> (p)
Health Status	.54 (= .47)	14.22 (< .01)
<u>Beliefs:</u>		
Substance Use	5.27 (= .02)	14.34 (< .01)
Risk	.01 (= .94)	13.06 (< .01)
Safety	2.49 (= .12)	8.53 (< .01)
<u>Behaviour</u>		
Substance Use	7.68 (< .01)	2.25 (= .12)
Risk- taking	.10 (= .75)	6.65 (< .01)
Safety	.25 (= .61)	7.02 (< .01)

Summary. Significant effects were found for both School and HLOC (External, Internal, Contextual). No interaction effect was found. Univariate tests indicated significant differences between schools with regard to substance use beliefs and behaviour. With regards to HLOC, significant effects were found for all dependent measures except substance use behaviour. Externals differed from both contextu- als and

internals on measures of health status, substance use, risk-taking, and safety beliefs, and risk-taking and safety behaviours. Internals and contextuels differed only on health status.

Research Question 2

The second research question asked how adults of different HLOC`s (External, Internal, and Contextual) compare in terms of the dependent measures: physical health status, and substance use, risk-taking and safety beliefs and behaviours. A two-way MANOVA was performed on the means of the dependent variables with School and HLOC (External, Internal and Contextual) as the independent variables.

Again, significant Bartlett`s tests necessitated removal of outliers from the data set. However, one of the seven dependent measures remained significant (safety beliefs) and continued attempts to reduce the significance compromised the remaining variables. Therefore, results obtained for this measure should be interpreted cautiously. This resulted in a total sample of 335 adults, 255 parents and 79 school personnel. Table 21 presents the frequency and percentages of adults within the various categories of HLOC (Internal, External and Contextual) for this new sample.

Table 21

Frequency and Percent of Adults in Categories of HLOC (Final Data Set)

HLOC	<u>School 1</u>		<u>School 2</u>		Total
	Frequ.	%	Frequ.	%	
Internal	74	27.3	16	26.2	90
External	115	42.4	15	24.6	130
Contextual	82	30.3	30	49.2	112
Total	271	100	61	100	332

The MANOVA produced a significant main effect for School, $F(7, 302) = 2.97$, $p < .01$. Follow-up univariate tests indicated effects for safety beliefs and substance use behaviours. The main effect for HLOC and the School by HLOC effect were not significant. See Table 22 for means, standard deviations and F ratios.

Table 22

Adult Means, Standard Deviations and Univariate F's as a Function of School andHLOC

Dependent Measure	School	HLOC						Effect School F (p)		
		External		Internal		Contextual			Total	
		M	(S.D.)	M	(S.D.)	M	(S.D.)		M	(S.D.)
Health Status	School 1	3.29	(.84)	3.79	(.83)	3.55	(.87)	3.50	(.87)	.19 (.66)
	School 2	3.27	(.80)	3.79	(.70)	3.74	(.90)	3.63	(.84)	
	Total	3.29	(.84)	3.79	(.81)	3.60	(.88)	3.53	(.87)	
Sub. Use Beliefs	School 1	1.83	(.43)	1.80	(.50)	1.85	(.51)	1.83	(.47)	2.94 (.09)
	School 2	1.67	(.53)	1.66	(.33)	1.79	(.44)	1.72	(.44)	
	Total	1.81	(.44)	1.78	(.48)	1.83	(.49)	1.81	(.47)	
Risk-taking Beliefs	School 1	1.32	(.33)	1.24	(.26)	1.25	(.30)	1.28	(.30)	1.38 (.24)
	School 2	1.16	(.20)	1.26	(.33)	1.23	(.25)	1.22	(.26)	
	Total	1.30	(.32)	1.24	(.27)	1.24	(.29)	1.27	(.30)	
Safety Beliefs	School 1	4.57	(.49)	4.77	(.42)	4.74	(.40)	4.68	(.45)	11.96 <.01
	School 2	4.91	(.20)	4.88	(.25)	4.94	(.13)	4.92	(.18)	
	Total	4.61	(.47)	4.79	(.40)	4.79	(.36)	4.72	(.43)	
Sub. Use Behaviour	School 1	1.89	(.69)	1.83	(.66)	2.01	(.68)	1.91	(.68)	4.04 (.05)
	School 2	1.48	(.46)	1.99	(.71)	1.65	(.56)	1.69	(.60)	
	Total	1.84	(.68)	1.86	(.66)	1.92	(.67)	1.87	(.67)	
Risk-taking Behaviour	School 1	1.26	(.20)	1.26	(.21)	1.23	(.19)	1.25	(.20)	.005 (.94)
	School 2	1.23	(.17)	1.30	(.22)	1.23	(.18)	1.25	(.19)	
	Total	1.26	(.20)	1.27	(.21)	1.23	(.19)	1.25	(.20)	
Safety Behaviour	School 1	3.96	(1.04)	4.21	(.82)	4.27	(.82)	4.12	(.93)	.79 (.37)
	School 2	4.31	(.83)	3.67	(1.01)	4.09	(.74)	4.04	(.86)	
	Total	4.00	(1.02)	4.12	(.87)	4.22	(.80)	4.11	(.91)	
Sample Size (n)	School 1	108		70		80		258		
	School 2	15		14		27		56		
	Total	123		84		107		314		

Summary. The two-way MANOVA produced a significant main effect for School, and follow up univariate tests indicated that the schools differed with regards to safety beliefs and substance use behaviours. The effect for HLOC and the interaction effect were not significant.

Research Question 3

The third research question addressed the relationship between adolescent HLOC beliefs (Internal, External and Contextual) and physical health status and substance use / risk-taking attitudes and behaviour. Secondly, it considered to what extent adolescents' substance use, risk-taking and safety beliefs are related to their corresponding behaviours. Pearson correlations were computed to determine relationships among the stated variables. Due to between school differences found in Research Question 1, results are presented for each school separately.

School One. As shown in Table 23, External HLOC significantly and positively correlated with substance use / risk-taking beliefs and behaviours, and negatively correlated with safety beliefs, safety behaviours and physical health status. However, although all correlations were significant at the $p \leq .01$ level, except for substance use behaviour, the associations were weak to moderate, at best. The strongest correlations were those between External HLOC and the belief measures.

Correlations with Internal HLOC demonstrate an opposite pattern. Significant positive correlations were found between Internality and health status, safety beliefs and safety behaviours. Significant negative correlations were found for substance use and risk-taking beliefs and behaviours. Again, the associations are rather weak, the highest

pertaining to safety beliefs and safety behaviours. Contextual HLOC did not correlate

Table 23

Correlations between Students' HLOC, Beliefs and Behaviours (School 1)

	Internal	Context	Hstatus	Subuse. Beliefs	Risk Beliefs	Safety Beliefs	Subuse	Risk	Safety
External	-.43 ($<.01$)	-.52 ($<.01$)	-.20 ($<.01$)	.2879 ($<.01$)	.2390 ($<.01$)	-.2258 ($<.01$)	.1040 ($<.05$)	.1970 ($<.01$)	-.1535 ($<.01$)
Internal		-.5443 ($<.01$)	.1772 ($<.01$)	-.1723 ($<.01$)	-.1687 ($<.01$)	.1943 ($<.01$)	-.1410 ($<.01$)	-.1551 ($<.01$)	.1811 ($<.01$)
Context			.0134 ($<.81$)	-.1046 ($<.05$)	-.0619 ($<.25$)	.0258 ($<.63$)	.0379 ($<.48$)	-.0350 ($<.52$)	-.0307 ($<.57$)
Hstat				-.0871 ($<.11$)	.0731 ($<.18$)	-.0705 ($<.19$)	-.2862 ($<.01$)	-.0309 ($<.57$)	.0963 ($<.08$)
Subuse Belief					.6238 ($<.01$)	-.4112 ($<.01$)	.4821 ($<.01$)	.4583 ($<.01$)	-.2646 ($<.01$)
Risk Belief						-.5588 ($<.01$)	.4196 ($<.01$)	.6346 ($<.01$)	-.3863 ($<.01$)
Safety Belief							-.2558 ($<.01$)	-.4211 ($<.01$)	.4242 ($<.01$)
Subuse								.6282 ($<.01$)	-.3386 ($<.01$)
Risk									-.3824 ($<.01$)
Safety									

significantly with any of the dependent measures, with the exception of a weak negative correlation with substance use beliefs.

As shown in Table 23 significant positive correlations ($p \leq .01$) were found between all beliefs and their corresponding behaviour measures. The strongest association was that between risk-taking beliefs and behaviours. Substance use

behaviours and beliefs demonstrated a moderate positive association, as did safety beliefs and behaviours.

Significant correlations were also found between engaging in risk-taking behaviours, substance use and taking safety precautions. Risk-taking and substance use behaviours demonstrated a significant positive correlation, and these behaviours showed significant, although moderate, negative correlations with safety behaviours. These results suggest that adolescents who use alcohol and drugs are also likely to engage in risky behaviours such as driving under the influence, and are less likely to engage in precautionary health practices such as wearing seatbelts and bicycle helmets.

School Two. Pearson Correlations for School 2 are shown in Table 24. While demonstrating a similar pattern of associations as those found for School 1, the correlations among the variables were weaker, and notably, Internal HLOC did not correlate significantly with any of the dependent measures with the exception of a weak positive correlation with safety behaviours and a moderate correlation with physical health status. It is possible that these results are due to the smaller sample size of School 2.

Table 24

Correlations between Students' HLOC, Beliefs and Behaviours (School 2)

	Internal	Context	Hstatus	Subuse. Beliefs	Risk Beliefs	Safety Beliefs	Subuse	Risk	Safety
External	-.4032 ($<.01$)	-.4845 ($<.01$)	-.2051 ($<.01$)	.2430 ($<.01$)	.2548 ($<.01$)	-.1902 ($<.01$)	.1606 ($<.02$)	.1478 ($<.03$)	-.1781 ($<.01$)
Internal		-.6052 ($<.01$)	.2086 ($<.01$)	-.1283 ($<.06$)	-.1241 ($<.07$)	.1218 ($<.08$)	-.0971 ($<.16$)	-.0535 ($<.44$)	.1372 ($<.04$)
Context			-.0256 ($<.72$)	-.0887 ($<.20$)	-.1030 ($<.14$)	.0492 ($<.48$)	-.0469 ($<.50$)	-.0774 ($<.27$)	.0243 ($<.73$)
Hstat				-.0124 ($<.86$)	.1341 ($<.06$)	.0883 ($<.21$)	-.0817 ($<.24$)	.1305 ($<.06$)	.1625 ($<.02$)
Subuse Belief					.7066 ($<.01$)	-.2652 ($<.01$)	.4117 ($<.01$)	.3995 ($<.01$)	-.1380 ($<.05$)
Risk Belief						-.4634 ($<.01$)	.3529 ($<.01$)	.5112 ($<.01$)	-.2205 ($<.01$)
Safety Belief							-.1623 ($<.02$)	-.2105 ($<.01$)	.3994 ($<.01$)
Subuse								.6238 ($<.01$)	-.1247 ($<.07$)
Risk									-.2421 ($<.01$)
Safety									

Summary. Externality among adolescents was significantly and positively correlated with substance use / risk-taking beliefs and behaviours, and negatively correlated with safety beliefs, safety behaviours and positive physical health status. These relationships were consistent across schools although School 2 demonstrated a weaker pattern of associations. While Internal HLOC showed significant relationships with all dependent measures for School 1 adolescents, it correlated with only two dependent measures at School 2: safety behaviours and physical health status.

Contextual HLOC was not associated with any of the dependent measures with the exception of a weak negative correlation with substance use beliefs (School 1 only).

Significant, positive associations found between beliefs and their corresponding behaviours suggest that adolescent health-related behaviour tends to correspond moderately with their beliefs as to the impact of such behaviour on their health and well-being. For example, as adolescents' beliefs regarding the impact of safety behaviours on healthy living increase, they engage in these behaviours more often.

Research Question 4

The fourth research question addressed the relationship between adult HLOC beliefs (Internal, External and Contextual), physical health status and substance use / risk-taking attitudes and behaviour. Secondly, it considered to what extent adults' substance use, risk-taking and safety beliefs are related to their behaviours. Pearson correlations were computed to determine the relationships among the stated variables.

School 1. Table 25 provides the Pearson correlations attained for the adult sample. In contrast to the findings for the adolescent group, External HLOC did not correlate with any of the substance use or risk-taking measures. Significant negative correlations were obtained with safety beliefs, safety behaviours, and with physical health status. Internal HLOC significantly and positively correlated with physical health status and safety beliefs. Contextual HLOC did not correlate significantly with any of the dependent measures.

Significant positive relationships were obtained for each belief measure and its corresponding behaviour. Although this reflects the results obtained for the adolescent

sample, the associations are moderate at best. The highest correlation was that pertaining to substance use beliefs and behaviours, ($r = .45$, $p \leq .01$).

Table 25

Correlations between Adults HLOC, Beliefs and Behaviours (School 1)

	Internal	Context.	Health Status	Sub.use Beliefs	Risk. Beliefs	Safety Beliefs	Sub.use Behav.	Risk. Behav.	Safety Behav.
External	-.4966 ($<.01$)	-.5978 ($<.01$)	-.1923 ($<.01$)	-.0104 ($<.88$)	.0418 ($<.53$)	-.1794 ($<.01$)	-.0377 ($<.58$)	.0026 ($<.97$)	-.1559 ($<.02$)
Internal		-.3989 ($<.01$)	.1624 ($<.02$)	-.0492 ($<.46$)	-.0313 ($<.64$)	.1300 ($<.05$)	-.0603 ($<.37$)	.0729 ($<.28$)	.0637 ($<.35$)
Context			.0536 ($<.43$)	.0564 ($<.40$)	-.0153 ($<.82$)	.0695 ($<.30$)	.0957 ($<.16$)	-.0700 ($<.30$)	.1055 ($<.12$)
Health Status				.1500 ($<.01$)	.0712 ($<.24$)	.0653 ($<.28$)	-.0705 ($<.25$)	-.0462 ($.45$)	.1182 ($<.05$)
Subuse Beliefs					.3555 ($<.01$)	-.1916 ($<.01$)	.4518 ($<.01$)	.1251 ($<.04$)	-.1383 ($<.02$)
Risk Beliefs						-.4289 ($<.01$)	.1210 ($<.04$)	.3796 ($<.01$)	-.2710 ($<.01$)
Safety Beliefs							-.0088 ($<.88$)	-.2193 ($<.01$)	.3585 ($<.01$)
Subuse Behav.								.1817 ($<.01$)	-.1122 ($<.06$)
Risk Behav.									-.2765 ($<.01$)
Safety Behav.									

School 2. As shown in Table 26 results obtained for the grouped adult sample parallel those of School 1. Internal and Contextual HLOC did not correlate with any of the dependent measures, and Externality significantly and negatively correlated with safety beliefs only. Beliefs and their corresponding behaviour measures were

significantly correlated at the $p \leq .01$ level.

Table 26

Correlations between Adults' HLOC, Beliefs and Behaviours (School 2)

	Internal	Context	Health status	Sub. Use Beliefs	Risk. Beliefs	Safety Beliefs	Sub. Use Behav.	Risk Behav.	Safety Behav.
External	-.3589 ($<.01$)	-.6624 ($<.01$)	-.1241 ($<.41$)	.0938 ($<.52$)	.1004 ($<.49$)	-.3276 ($<.02$)	-.1092 ($<.45$)	.0286 ($<.84$)	.0425 ($<.77$)
Internal		-.4615 ($<.01$)	.2098 ($<.16$)	-.0298 ($<.84$)	-.0114 ($<.94$)	.0909 ($<.54$)	.1481 ($<.31$)	-.0659 ($<.65$)	-.2241 ($<.12$)
Context.			-.0461 ($<.76$)	-.0664 ($<.65$)	-.0869 ($<.55$)	.2458 ($<.09$)	-.0151 ($<.92$)	.0256 ($<.86$)	.1333 ($<.36$)
Health status				-.3572 ($<.01$)	-.2361 ($<.05$)	.3198 ($<.01$)	-.3035 ($<.01$)	-.3837 ($<.01$)	.0861 ($<.49$)
Subuse Beliefs					.6501 ($<.01$)	-.6401 ($<.01$)	.5803 ($<.01$)	.5649 ($<.01$)	-.2602 ($<.03$)
Risk. Beliefs						-.7887 ($<.01$)	.3850 ($<.01$)	.4240 ($<.01$)	-.3703 ($<.01$)
Safety Beliefs							-.4547 ($<.01$)	-.4892 ($<.01$)	.3727 ($<.01$)
Subuse. Behav.								.4664 ($<.01$)	-.1774 ($<.14$)
Risk Behav.									-.2673 ($<.02$)
Safety Behav.									

Summary. Few relationships were found between HLOC and the dependent measures for the adult samples. External HLOC negatively correlated with health status and safety behaviours for School 1 only, and with safety beliefs for both schools. Internal HLOC positively correlated with physical health status for School 1 only. No relationships were found for Contextual HLOC. Similar to the adolescent sample,

significant relationships were demonstrated between health-related beliefs and their corresponding behaviours, indicating a tendency for adults to engage in behaviours consistent with their beliefs.

Research Question 5. Question five asked: How do the HLOC orientations of adolescents relate to those of their parents? In order to determine this relationship, parental scores on the internal and external subscales of the HLOC scale were matched with those of their children. Thus only cases in which there was a parent and student from the same family were included and analyzed. Pearson correlations were then computed to determine relationships among the variables. Results for each school are shown in Tables 27 and 28. No significant relationships were found between the HLOC of parents and their children. Thus, at this stage in their development, adolescents' HLOC scores (Internal and External) do not reflect those of their parents.

Table 27

Correlations between Parent / Child HLOC (School 1)

Variable	Student IHLOC	Parent IHLOC	Student EHLOC	Parent EHLOC
Student IHLOC	1.000	-.0225 (p < .74)	-.1934 (p < .01)	-.0023 (p < .97)
Parent IHLOC		1.000	.0323 (p < .63)	-.3658 (p < .01)
Student EHLOC			1.000	-.0234 (< .73)
Parent EHLOC				1.000

Table 28

Correlations Between Parent / Child HLOC (School 2)

Variable	Student IHLOC	Parent IHLOC	Student EHLOC	Parent EHLOC
Student IHLOC	1.000	-.0949 (p < .53)	-.2389 (p < .01)	.0195 (p < .90)
Parent IHLOC		1.000	-.0955 (p < .53)	-.5588 (p < .01)
Student EHLOC			1.000	.0791 (p < .60)
Parent EHLOC				1.000

Chapter Summary

Research question 1. Significant effects were found for both School and HLOC (External, Internal, Contextual). Univariate tests indicated significant differences between schools with regard to substance use beliefs and behaviour. For HLOC, significant effects were found for all dependent measures except substance use behaviour. Externals differed from both contextuials and internals on health status, substance use, risk-taking, and safety beliefs, and risk-taking and safety behaviours. Internals and Contextual adolescents rated themselves as physically healthier than their External counterparts. External adolescents were less likely to view substance use and risk-taking as having a negative impact on healthy living, and were more likely to engage in risk-taking behaviour. Further, Externals were less likely to endorse the positive effects of and participate in safety behaviours. Internals and Contextuials differed only on health status.

Research question 2. The two-way School by HLOC (External, Internal, Contextual) MANOVA produced a significant effect for School, and follow-up univariate tests indicated that the schools differed with regards to safety beliefs and substance use behaviours. Neither the effect for HLOC nor the HLOC by School effect were significant.

Research question 3. Significant, albeit weak, positive relationships were demonstrated between externality and substance use / risk-taking beliefs and risk-taking behaviours among adolescents. Weak negative relationships were demonstrated between externality and safety beliefs / behaviours and positive physical health status.

Associations with Internal HLOC differed across schools, demonstrating significant relationships with all dependent measures at School 1, and with safety behaviours and health status at School 2.

Moderate positive relationships between adolescents' health-related beliefs and behaviours were found. Such relationships suggest that as adolescents' beliefs about the positive effects of health-related behaviour (i.e., Safety practices) become stronger they are more likely to engage in such behaviour. With regards to health threatening behaviour, these results suggest that the tendency to engage in such behaviour decreases as adolescents' become more cognisant of the negative effects of such behaviour on their health.

Research question 4. Moderate, negative relationships were found between external HLOC and physical health status, safety beliefs, and safety behaviours for the adult sample. Internal HLOC was positively related to physical health status for school 1 only, and did not demonstrate significant associations with any other measure. Moderate positive associations between beliefs and behaviours were found for both adult samples.

Research question 5. There were no significant relationships between the HLOC scores of parents and those of their children. This suggests that at this stage in their development, adolescents' beliefs as to the source of control over their health do not reflect those of their parents.

Chapter 5

Discussion

This chapter provides a discussion of the results described in Chapter 4, highlights the strengths and limitations of the investigation, and provides suggestions for future research.

Results and Their Relationship to Current Literature

In accordance with the HLOC literature, an attempt was made to classify subjects in this study according to the traditional two-dimensional conceptualization of HLOC in which individuals have either an internal or external orientation. However, many subjects demonstrated high (or low) scores on both the Internal and External subscales, necessitating the creation of a third category named "Contextual HLOC". It was hypothesized that these individuals rely upon situational factors, not attributional style, in determining their HLOC. This finding is a contribution to the literature in the field, and further research is required in order to assess the validity of the hypothesis outlined above.

Adolescents

Health Status. The results of this investigation indicated that the self-reported health status of Internals differed significantly from Contextuals, and both groups differed significantly from Externals on this measure. Internals and Contextuals rated themselves as healthier physically than their External counterparts. These findings are comparable to those of Kellerman (1980) who found that ill adolescents were significantly more external than their healthy peers. Similarly Parcel et al. (1980) found

that internal adolescents are less likely to report frequent illness. This study also found physical health status to be negatively related to External HLOC and positively related to Internal HLOC. Such findings are consistent with those of Schwarzer et al. (1990) who found a positive relationship between negative physical health status (as measured by adolescent health complaints) and External HLOC, and Seeman & Seeman (1983) who found a significant positive association between internal HLOC and positive self-rated health among adults.

Substance Use. No significant differences were found between adolescents of differing HLOC's with regard to substance use behaviours, including smoking, caffeine use, and alcohol use. This contrasts with the results of Eiser et al. (1989) who found that among adolescents "never smokers" were highest, and current smokers lowest, on Internal HLOC. The current finding also differed from those of Dielman et al. (1984) who found that Internal adolescents were more likely to use alcohol and drugs than their external peers. The results of the present study do not resolve this discrepancy in the literature. One possible explanation for the lack of significant results is the relatively low frequency of such behaviours among this particular sample. However, significant differences for HLOC were found for substance use beliefs. Internals and Contextuals were less likely to endorse the positive health effects of such behaviours. As previous research has focussed solely on substance use behaviours, and not on beliefs as to the effects of such behaviours, this finding represents a contribution to the literature in this area. The above findings suggest that one's HLOC may wield more influence over one's substance use beliefs than over one's actual behaviour. Thus, while Internals may be

more aware of (or more likely to acknowledge) the negative effects of substance use, they are possibly no less likely than externals to smoke and drink.

The relationship between HLOC orientation and substance use was also explored. Significant positive correlations were found for External HLOC and substance use beliefs and behaviours. The association was stronger for beliefs, with substance use behaviours demonstrating a weak, albeit significant, association to HLOC. This corresponds to the comparative findings outlined above. Internality was negatively related to substance use beliefs and behaviours, and again the relationship was stronger for the belief measure. The latter findings applied to School 1 only, possibly due to the smaller sample size of School 2. Such findings are in line with the research findings of Dielman et al. (1987) who found that internal HLOC significantly and negatively correlated with substance use behaviours.

Risk-taking. Significant differences were found for HLOC with regards to risk-taking and safety beliefs. External adolescents demonstrated significantly lower scores than internals and contextualls with regards to safety beliefs, and significantly higher scores than internals and contextualls on risk-taking beliefs. Thus, internal adolescents are more likely to endorse the positive health effects of safety behaviours, and less likely to endorse risk-taking behaviours. As the previous research in this area has focussed on behaviours only, this finding is a new contribution to the literature and warrants further investigation. Further, significant differences were found with regard to risk-taking and safety behaviours. Externals engaged in risky behaviours to a greater extent than Internals and Contextualls. Internals and Contextualls engaged in safety-related behaviour

to a greater extent than Externals. As no comparative research with regards to risk-taking has been conducted with adolescents, these findings represent a new contribution to the literature in this area and support the hypothesis, drawn from preliminary correlational research, that the promotion of a sense of personal responsibility and control over health among adolescents may reduce the likelihood of their engaging in risky behaviour.

As all of the research in this area is correlational in nature, correlational analyses were conducted to determine the relationship between HLOC and risk-taking and safety measures. External HLOC was significantly and positively related to risk-taking beliefs and behaviours, and negatively related to safety behaviours. The reverse was true for Internality, although significant results were found for School 1 only with regards to risk-taking. Again, beliefs demonstrated a stronger relationship to HLOC than behaviours, although the range was not so broad as that demonstrated for adolescent substance use. Such findings are consistent with those of Whatley (1991) who found that Internals were less likely to approach risky situations, and to results obtained from research with adults, such as Ferguson (1989) who found a significant negative correlation between risk-taking behaviour and Internal HLOC. The results for safety behaviours differ from the findings of Desmond et al. (1985) who failed to find a significant relationship between HLOC and the use of seat belts among high school students. This may in part be explained by the larger sample size and broader range of safety behaviours utilized in the current study.

Beliefs and Behaviours. Significant, positive correlations were found between belief measures and their corresponding behaviours, suggesting that as adolescents' beliefs as to the positive effects of health-related behaviour become stronger they are

more likely to engage in such behaviour. The strongest correlation was found for risk-taking beliefs and behaviours, suggesting that adolescent beliefs as to the health effects of such behaviours may indeed influence the likelihood of their engaging in such behaviours. While positive correlations were found for substance use beliefs and behaviours, and safety beliefs and behaviours, the associations were moderate at best. It is possible that other factors may intervene in the decision to actually engage in such behaviours, despite beliefs as to their effect on one's health. Perhaps the general societal acceptance of activities such as drinking coffee, smoking, and drinking alcohol render beliefs as to their negative health effects less influential. Further, activities such as wearing seatbelts and safety helmets require some effort (albeit minimal) which may serve as a barrier to always engaging in these behaviours.

As discussed in Chapter 2, numerous factors may influence the likelihood of engaging in behaviours despite beliefs as to their negative / positive health effects (Ronis, 1992; Rosenstock et al., 1988). The HBM, and the revised model presented by Rosenstock et al. (1988), suggest that while beliefs as to the health effects of behaviours and perceived seriousness of a health threat are important, factors such as perceived vulnerability, perceived costs and self-efficacy also play a role in health-related decisions. The findings of the present study may suggest that, for highly unaccepted risk behaviours (i.e., drug use, driving under the influence, and carrying a weapon), one's beliefs as to their negative health effects may indeed strongly influence and perhaps predict behaviour. However for more accepted, everyday activities (i.e. drinking coffee and obeying traffic regulations) behaviour is influenced by a wider range of attitudinal

variables.

Adults

Health Status. In contrast to the work of Kellerman (1980) and Parcel et al. (1980) with adolescents, no significant differences were found between individuals of differing HLOC's with regards to the dependent measures, including Health Status. As the literature contained no comparative research with adults regarding health status and HLOC, this finding contributes to the literature in this area.

Despite the lack of significant differences among adults of differing HLOC, correlational analyses did reveal significant relationships between HLOC and physical health status. Physical health status was found to negatively correlate with External HLOC and positively correlate with Internal HLOC (these relationships were found for School 1 only). These findings are comparable to those of Seeman & Seeman (1983) who found a significant positive association between internal HLOC and positive self-rated health among adults. Thus, while significant relationships were found, these did not translate into significant differences between Internals, Externals, and Contextuals on this measure. When one considers the actual magnitude of the associations among the variables, it is evident that whilst significant, the relationships are weak. Perhaps, for adults, physical health status is determined by a number of factors, and while HLOC plays a role, in isolation it does not differentiate among healthy and non-healthy adults. Included among such factors are health value, education and knowledge, self-efficacy, and socioeconomic status (Kist-Kline & Lipnickey, 1989; Lau, 1986, 1988; Pender et al., 1990; Riggs & Noland, 1984; Wallston, 1992). One might also add life experience to

such a list.

Substance Use. The current study did not support previous findings with regards to HLOC and substance use among adults. No significant differences were found with regards to substance use as a function of HLOC. Further, correlational analyses did not reveal any significant relationships between HLOC and substance use beliefs or behaviours. These results contrast to the findings of Shipley (1981) and Horwitz et al. (1985) who found that Internals were more often abstinent from smoking and less likely to resume smoking after treatment than Externals; similar findings were reported by Kaplan & Cowles (1978). The present results also differ from those of Zindler-Wernet & Weiss (1987) who found that individuals who decreased their use of alcohol were significantly less External (Chance) than those who did not, and from Fleming (1991). It is possible that the current findings differ from the majority of previous research in part due to the nature of the dependent measure. Whereas previous research has tended to look at behaviours in isolation, i.e., smoking alone, the current measure included a broader range of behaviours: smoking, alcohol use, and caffeine intake. The only study reviewed that included more than one substance was that of Lau (1988), who also failed to find a significant relationship between HLOC and substance use behaviour (smoking and alcohol use) among adults.

Risk-taking. Again, the current study failed to support the results of previous research (Conway et al., 1992; Ferguson, 1989) with regard to the relationship between HLOC and risk-taking among adults. No significant relationships were found between HLOC (External, Internal, Contextual) and risk-taking beliefs and behaviours. Further,

there were no significant differences among adults of various HLOC's with regards to the frequency of such behaviours and beliefs. This is a contribution to this area of inquiry as no prior comparative research has been conducted.

With regard to safety, External HLOC was found to negatively correlate with safety beliefs and behaviours, while Internal HLOC correlated with safety beliefs only. The latter results are congruent with those of Conway et al. (1992) who included a measure of Traffic Risk-taking. It is possible that the smaller sample size of School 2 is responsible for the lack of significant relationships. However, similar to substance use behaviours, it appears that while internals may be more likely to endorse the beneficial health effects of safety behaviours, they are no more likely to engage in them, perhaps for a variety of reasons including the fact that such behaviours require effort.

Discrepancy. The above findings point to a discrepancy between adults and adolescents with regards to the influence of HLOC on their beliefs and behaviours. Adolescents, according to this study, appear to rely on their attributional style to some extent when making health-related behavioural choices; however, this cannot be said of adults. The lack of significant differences between adults of differing HLOC's indicates that other variables influence their health-related choices and health status. Such findings correspond to the conclusions of Wallston (1992), Wallston & Wallston (1982), and Zindler-Wernot & Weiss (1987).

Beliefs and Behaviours. Significant positive relationships were found for each belief measure and its corresponding behaviour measure, suggesting that as beliefs about the negative / positive health effects of behaviours increase, the likelihood of engaging in

such behaviours decreases / increases. However, the associations were low to moderate, again suggesting the presence of other factors influencing health behaviour aside from HLOC beliefs alone, such as those outlined for adolescents above.

Parent and Child HLOC

In contrast to previous research the current study did not support the existence of a relationship between the HLOC of parents and their children. This contrasts to the findings of Lau (1988) which identified parent's HLOC as an important source of the HLOC of young adults. However, Lau's research was conducted with college freshmen, not adolescents. At present, no other research of this nature has been conducted with adolescents, and as such this represents a new contribution to the literature. A possible explanation for the results may thus lie in the age of the sample; perhaps as adolescents move into adulthood their HLOC beliefs begin to more closely resemble those of their parents.

Critique

Strengths

The large number of students surveyed and high return rates allowed for greater generalizability to the communities under investigation and increased the likelihood of finding significant between group differences. The high response rate was encouraged by the method of data collection. Surveys were completed by all students during regular classroom hours and not by voluntary participation outside of school time. This procedure enhanced students' motivation and reduced potential bias by ensuring greater representativeness of the sample. Had the study utilized a volunteer sample, their

responses may have differed from those obtained using all students. Thus, the data collection procedures allowed for a representative sample of middle class urban high school students, and reduced potential bias.

This study also benefitted from the comprehensive nature of the Health Impact Survey and the dependent measures chosen for investigation. Whereas prior research in the area of substance use and risk-taking has utilized fairly circumscribed measures, the current study included a broader range of behaviours and beliefs. Further, the rigorous instrument development procedure by means of the Delphi process ensured that the instrument contained items that were most relevant and meaningful to this particular sample.

A further strength of the current study was the use of Factor Analyses to ensure the trustworthiness of results. The analyses allowed for the investigation of appropriate clusters of beliefs and behaviours, and provided support for the division of the HLOC scale into Internal and External subscales.

Finally, the current study was one of the first to explore and discuss Contextual HLOC. In so doing, it has provided a new arena for future research within the HLOC field.

Limitations

A potential limitation of this study may lie in the length of the Health Impact Survey. It is possible that responses to the latter portion of the questionnaire were influenced by decreased attention and / or fatigue on the part of participants. Further, as parents and staff members were asked to complete the surveys on their own time, the

length may have influenced their decision to participate, and thereby contributed to the lower return rate for adults, particularly from School 2. However, as stated above, the comprehensive nature of the survey allowed for a more in-depth investigation of the variables of interest and thus likely balanced this limitation.

The study was also weakened by the differences in adult sample size between schools. Further, the majority of parent respondents were mothers, and thus equal representation of both sexes was not attained in the adult sample. This may have influenced the results of this study.

Finally, as the schools did not allow for the collection of demographic information, including cultural background, the current study could not address such factors. Had such information been made available, their influence on, and their relationship to HLOC, health beliefs, and health behaviours might have been determined. It is possible that ethnicity and culture are important variables to consider with regards to substance use and risk-taking, and with regards to where one attributes control over and responsibility for one's health, however due to the lack of such information the current study was unable to investigate this.

Recommendations For Future Research

The current study is one of the first attempts to investigate HLOC and a broad range of risk-taking behaviours among adolescents, and as such this is an area deserving of further research consideration. Given that such behaviours constitute the primary causes of adolescent mortality and morbidity, and the inter-relationships that exist among such behaviours, the current findings support the promotion of an internal HLOC within

the context of CSH programming. Future research investigating the role of HLOC and sexual risk-taking behaviour may be a particularly fruitful area given the increasing incidence of HIV infection among adolescents and young adults.

For adolescents, the current study supported prior research indicating that Internals report more positive health status' than their External counterparts. However, such results are based solely on self-report and therefore may be subject to error. Future research might supplement self-report with physiological measures of health status, such as blood pressure, and thereby determine if actual differences in physical health status exist, or if Internals simply rate their health status as better due to their perception of personal control and responsibility.

As described previously, beliefs as the effects of various behaviours on one's health do not necessarily translate into action. Some possible theoretical explanations based on the HBM were explored, however, further research might investigate the potential obstacles to performing (or not performing) certain behaviours. CSH programs may need to determine the nature of such obstacles and then develop goals aimed at reducing their impact. Instruction as to the effects of substance use will be of little value if factors such as perceived invulnerability, peer pressure and familial influence are ignored. For example, it may be that students who believe in the negative health effects of smoking experience obstacles such as the lack of practical smoking cessation programs and negative peer pressure. Further, their environments may not discourage such behaviour, i.e., school grounds with smoking areas, parents and teachers who smoke, etc. CSH programs can encourage the adoption of healthy behaviours and

discourage unhealthy behaviour by addressing such issues and altering behavioural “norms” both at school, and within the home and community.

Finally, further investigation with regards to Contextual HLOC is warranted. This study is one of the first to explore this construct, and future research, utilizing various HLOC scales (Wallston et al., 1978; Lau & Ware, 1981), might provide support for the validity of the construct, and provide information as to whether the hypothesis offered in this thesis is valid: that the HLOC of individuals within this category is situational in nature. This may be accomplished through research which incorporates a qualitative component. For example, after the administration of the HLOC instrument and classification of individuals as contextuials, the researcher might identify these participants and follow up with interview questions regarding their beliefs and behaviours in various health-related situations. In so doing, it may be possible to identify if indeed their HLOC is “contextual” and, if so, the nature of the contextual variables. Such research may also illuminate differences within the contextual category itself, i.e., between those individuals with high scores on both internal and external dimensions, and those with low scores on both dimensions.

Implications for Health Promotion and Education

The impetus for research in the area of health promotion and education stems from a growing disillusion with the current health care system and recognition of the limitations of current approaches to health education in addressing the needs of individuals in our society (Tones, 1986). Traditional approaches to health care, which emphasize remediation and information transfer have not, and most likely cannot,

produce lasting changes in health-related attitudes and behaviours (Cameron et al., 1991; Volkan & Fetro, 1990), nor can they address the long-term direct and indirect effects of such behaviours. A lack of commitment to primary prevention and health promotion in general, and the lack of a co-ordinated, collaborative approach by all sectors of society, leads to endeavours which only skim the surface of health, education, and social problems.

The predominant approach to health care is remedial. We await the development of problems and then attempt to deal with them. The existence of problems in turn provides a rationale for the allocation of time and resources. However, if these resources were implemented prior to the development of health and social problems, it may be possible to limit the frequency with which such problems occur and, in turn, produce a healthier and more productive population. As such, it is essential to examine approaches to health education and focus increasing attention on children and adolescents.

It is during adolescence that many of the health risk-taking behaviours develop which lead to health and social distress. Further, unlike any other age group, the health status of adolescents has declined over the last 20 years (Whatley, 1991). However, primary prevention efforts, such as CSH programs, meet with numerous obstacles, many of which derive from a limited view of health, and a lack of understanding as to the intimate connection between health and academic and social success. These in turn lead to an understandable lack of commitment to comprehensive health education, which must compete for resources within an over-crowded curriculum and underfunded

education system. The result is a “poverty cycle” within the school system in which “policies that do little to support quality education programs simply perpetuate the inadequate provision of resources and the absence of coordination” (Cameron et al., 1991, p. 2). It is therefore essential that we view health broadly in terms of the physical, mental, and social well-being of individuals. With such an enlarged view of health, we will likely loosen existing constraints to the provision of comprehensive health education.

The current study was part of a larger research initiative in CSH. It is hoped that research in this area will provide empirical evidence with regard to the validity and importance of a coordinated, multi-focussed approach to health education, and loosen existing barriers to its implementation. A cornerstone in this endeavour is the recognition of a link between behaviour and health status. It is apparent that if health educators truly hope to influence the health and well-being of the population, they must actively work to reduce the rate of health risk-taking behaviour. Such behaviours develop during childhood and adolescence and are generally difficult to change through traditional approaches. As such, it is essential to consider the underlying processes which influence their development (Parcel et al., 1980) and hence the current focus on HLOC as an important variable for understanding health-related attitudes and behaviours.

The current findings support the notion that, among adolescents, a sense of control over, and responsibility for, health increases awareness of the negative consequences of risk-taking and the likelihood that individuals will refrain from health-risking behaviours which may have serious ramifications for their physical, emotional,

and social well-being, and future success. The implication of such findings is that HLOC may serve as a guiding principle underlying health education endeavours.

For any educational endeavour to be effective, it must be based on such guiding principles; health education is no exception. If approached haphazardly, and focussed solely on content, it is unlikely to succeed. Educators have long recognized that teaching and learning are not simply about imparting and receiving information. Successful teaching focusses not only on the content of the information, but also on the process by which learning occurs. We will go far towards achieving our aims if the principles of teaching and learning are incorporated into health education. Thus health education, to be effective, cannot have as its sole objective an increase in knowledge. The long term objectives are lasting attitudinal and behavioural change. The current research in turn suggests that such change may occur through the provision of experiences that increase individuals' sense of control over health. CSH programs may focus on specific objectives and issues, but are guided by this notion that underlying many behavioural choices are the individual's perceptions of control and responsibility.

In practical terms, this alters the nature of health education. Whereas in the past, the primary goal was defined in terms of increased knowledge, and the primary method was didactic, a program guided by the above notion has a broader objective: to produce children who feel in control of , and are capable of, making sound choices with regards to their health and lives. Such children are far less likely to engage in health-compromising behaviour. The method of teaching and learning also change. Activities may focus on a particular theme, but are structured to influence children's ability to assess personal

health risks and action alternatives, problem solve, make decisions, and act on the basis of such decisions. Essential are activities in which children experience success in, and are afforded the opportunity to evaluate, these choices (Parcel et al., 1980). Importantly, such an approach is unlikely to be successful without the participation of all members of the CSH team, including parents and the community, and the co-ordination of instruction and health services within healthful school, home, and community environments.

The current findings also point to the need for educators, parents, and the community to recognize that attitudes regarding the consequences of behaviours do not always reflect one's actual behavioural choices. The current study provides empirical support for this well-known paradox, results indicating only moderate relationships between beliefs and behaviours (particularly socially accepted behaviours), and suggests that the psychological, social / interpersonal, and environmental barriers to altering such behaviours must be considered. Again, this supports the need for a co-ordinated, multifocussed approach such as that promoted by CSH educators.

Conclusions

The results of this investigation indicate that HLOC, while not a prominent predictor of adult health-related beliefs and behaviour, is an important variable to consider in the attempt to understand adolescent risk-taking beliefs and behaviours. In general, Internal and Contextual adolescents rated themselves as physically healthier, rated risky behaviours as more detrimental to one's health, and engaged in fewer risky and more safety behaviours than their External peers. As such, it is reasonable to suggest that CSH programming may influence the overall physical health status of youth by

teaching adolescents to take responsibility for their health-related choices. The low to moderate relationships between beliefs and behaviours found in this study indicate a need for further research into the possible obstacles to acting according to one's beliefs. Further, they suggest the need for CSH programs which focus on a variety of variables, including environmental factors which may influence the choices of youth.

Comprehensiveness in the context of health education necessitates a broad conceptualization of the factors influencing health and the means by which health risk-taking behaviours are developed and reduced. Moving beyond traditional knowledge-based instruction, such programs aim to improve the health-related knowledge, beliefs, and behaviour of youth while fostering a sense of personal responsibility for health, through a multifocused, multisectorial approach, which relies heavily upon the involvement and collaboration of the school, home and community. Such an approach recognizes the value of fostering environments conducive to good health. Thus, health instruction is coordinated with school health services within a healthful school, home, and community environment. Such environments provide an opportunity for the development and reinforcement of healthful norms, through both peer and parental role-modelling, and the availability of opportunities for practice and support. In short, CSH seeks the involvement of all levels of society in order to develop, model, and reinforce healthy attitudes and behavioural choices.

The urgency of such measures cannot be overlooked. Statistics attest to the frequency of health risk-taking behaviours among youth, which are primary causes of adolescent mortality and key determinants of present and future health status. Whereas

in the past the major threats to health were infectious diseases, the majority of today's health problems are rooted in health risk-taking behaviours. Given the intimate connection between good health and learning, the consequences of unhealthy behaviours include immediate and long-term academic and social problems. Secondary effects include poor academic performance, loss of employment, and severe mood changes that may lead to depression, violence, and suicide. Thus, the societal impact of poor health in general, and risk-taking behaviour in particular, is staggering. Health can no longer be viewed as the domain of the private individual, for to do so ignores the interconnectedness of the individual with his or her environment, and reflects a lack of awareness as to the far reaching consequences of poor health. Such consequences are not suffered by the individual in isolation, but by society as a whole.

The development of CSH programs reflects this growing awareness. Through the implementation of such programs adolescents may develop the knowledge, attitudes, and skills necessary to making healthy behavioural choices, and increase their sense of personal responsibility for, and control over, their health. It is hoped that the fulfillment of such objectives will allow adolescents to achieve their fullest potential, both academically and socially. The current study demonstrates the value of adolescent perceptions of control with regards to substance use, risk-taking, and safety beliefs and behaviours, and thus supports the development, implementation, and evaluation of CSH programs within Canadian schools.

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Appendix A

Student Response Frequencies to the Health Locus of Control Scale

Please indicate the way you feel about each of the following statements:

	Question	SDA	DA	N	A	SA	M
1	If I become sick, I have little power to make myself well again	171	241	78	53	21	2.13
2	I am in control of my own health	8	25	104	258	168	3.98
3	When things go wrong with my health, it is rarely my own fault	45	204	183	100	27	2.75
4	The main thing which affects my health is what I do for myself	8	20	108	303	123	3.91
5	Even if I take care of myself, it is hard to avoid illness	53	186	145	149	29	2.85
6	I can control the effect that the stresses of life have on me	35	95	143	222	66	3.34
7	Small changes in the way I live can lead to an improvement in my overall feeling of well-being (for example, in what and when I eat, how much and when I exercise or rest)	2	19	95	251	196	4.10
8	My lifestyle is something which can affect my future health	8	18	43	267	226	4.22
9	There is a link between too much personal worry, nerves or stress and becoming ill	11	28	98	268	155	3.94
10	People get sick because they are unlucky	267	215	67	6	6	1.70
11	Only the dentist can take care of my teeth	284	208	40	11	18	1.70

	Question	SDA	DA	N	A	SA	<u>M</u>
12	The only way I can stay healthy is to do what other people tell me to do	248	235	61	11	6	1.74
13	If I feel sick, I have to wait for other people to tell me what to do	230	258	58	10	7	1.77
14	No matter what I do, if I am going to get sick, I will get sick	93	224	137	91	18	2.50
15	Having regular contact with my physician is the best way for me to avoid illness	39	152	207	144	22	2.93
16	My family has a lot to do with my becoming sick or staying healthy	62	164	194	122	22	2.78
17	Luck plays a big part in determining how soon I will recover from an illness	183	267	88	20	4	1.92
18	My good health is largely a matter of good fortune	165	235	105	41	17	2.13

Note: SDA = Strongly Disagree
 DA = Disagree
 N = Neutral
 A = Agree
 SA = Strongly Agree
 M = Mean Score

Adult Response Frequencies to the Health Locus of Control Scale

Please indicate the way you feel about each of the following statements:

	Question	SDA	DA	N	A	SA	M
1	If I become sick, I have little power to make myself well again	157	161	12	14	7	1.73
2	I am in control of my own health	6	21	22	180	121	4.11
3	When things go wrong with my health, it is rarely my own fault	50	154	79	52	13	2.49
4	The main thing which affects my health is what I do for myself	4	18	42	199	87	3.99
5	Even if I take care of myself, it is hard to avoid illness	33	141	78	91	9	2.72
6	I can control the effect that the stresses of life have on me	4	32	48	210	56	3.81
7	Small changes in the way I live can lead to an improvement in my overall feeling of well-being (for example, in what and when I eat, how much and when I exercise or rest)	2	4	13	197	135	4.31
8	My lifestyle is something which can affect my future health	1	5	7	163	177	4.44
9	There is a link between too much personal worry, nerves or stress and becoming ill	2		18	173	160	4.39
10	People get sick because they are unlucky	173	120	41	8	4	1.70
11	Only the dentist can take care of my teeth	148	179	7	7	12	1.74

	Question	SDA	DA	N	A	SA	M
12	The only way I can stay healthy is to do what other people tell me to do	130	194	21	1	6	1.75
13	If I feel sick, I have to wait for other people to tell me what to do	179	158	6	1	7	1.57
14	No matter what I do, if I am going to get sick, I will get sick	80	176	54	30	10	2.18
15	Having regular contact with my physician is the best way for me to avoid illness	40	139	93	69	11	2.64
16	My family has a lot to do with my becoming sick or staying healthy	37	149	91	60	11	2.59
17	Luck plays a big part in determining how soon I will recover from an illness	133	193	23		3	1.71
18	My good health is largely a matter of good fortune	103	168	42	33	3	2.04

Note: SDA = Strongly Disagree
 DA = Disagree
 N = Neutral
 A = Agree
 SA = Strongly Agree
 M = Mean Score

Appendix B

Student Response Frequencies to the Health Beliefs Scale

For the following list of items, please indicate the effect you believe each item has on healthy living:

	Question	VB	SB	U	SG	VG	M
1	Eating junk food (e.g., candy, chips, etc.)	117	374	49	13	8	1.97
2	Eating from a variety of foods from various food groups each day	3	7	16	111	422	4.69
3	Dieting by missing 1 or more meals a day	233	224	66	22	10	1.83
4	Maintaining weight by balancing caloric intake and exercise	5	17	95	200	244	4.18
5	Engaging in 20 minutes (or more) of aerobic exercise at least 3 times per week	4	8	46	158	344	4.48
6	Eating foods low in salt	5	22	93	260	179	4.05
7	Avoiding or reducing your consumption of fat (eg., fried food, butter)	10	25	47	239	240	4.20
8	Drinking alcohol: 2 drinks or less at one time	101	176	169	85	28	2.58
9	Drinking alcohol: 3 drinks or more at one time	226	205	96	18	15	1.91
10	Using illegal drugs	406	88	38	16	12	1.46
11	Smoking or chewing tobacco	380	135	25	11	12	1.47
12	Drinking more than 4 cups of coffee a day	231	231	78	11	11	1.83
13	Driving too fast	146	173	189	21	28	2.30
14	Driving while influenced by drugs and alcohol	481	42	22	3	12	1.26
15	Riding in a car going too fast	145	200	174	19	21	2.23

	Question	VB	SB	U	SG	VG	<u>M</u>
16	Riding with someone influenced by drugs or alcohol	460	56	30	4	12	1.31
17	Getting into a physical fight	164	251	85	39	22	2.12
18	Wearing a seatbelt	14	10	35	187	313	4.39
19	Wearing a helmet while riding a bike	19	7	70	198	261	4.22
20	Following traffic regulations while riding your bike	13	8	52	212	274	4.30
21	Carrying a weapon	158	106	183	61	48	2.52
22	Having fun with your parents	13	12	86	27	28	4.08
23	Having fun in any way	8	11	68	147	318	4.37
24	Feeling unhappy	167	247	86	27	28	2.10
25	Seeing your family doctor regularly	13	12	86	273	177	4.05
26	Reading information about health issues	14	10	137	271	126	3.87
27	Relaxing and forgetting about your cares	12	42	123	233	149	3.83
28	Using stress management techniques	13	9	116	250	172	4.00
29	Using time management techniques	11	11	153	235	151	3.90
30	Getting adequate sleep and rest	9	6	34	179	333	4.46
31	Seeking professional help	20	26	219	207	88	3.57
32	Spending quality time with friends	6		31	227	293	4.44
33	Spending quality time with family	11	11	54	240	242	4.24

	Question	VB	SB	U	SG	VG	<u>M</u>
34	Liking and feeling good about yourself	8	1	30	162	360	4.54
35	Talking to family members about personal concerns	21	16	124	220	175	3.92

Note: VB = Very bad for health
 SB = Somewhat bad for health
 U = Unsure
 SG = Somewhat good for health
 VG = Very good for health
M = Mean Score

Adult Response Frequencies to the Health Beliefs Scale

For the following list of items, please indicate the effect you believe each item has on healthy living:

	Question	VB	SB	U	SG	VG	M
1	Eating junk food (e.g., candy, chips, etc.)	89	241	11	7	1	1.83
2	Eating from a variety of foods from various food groups each day	3	3		56	290	4.78
3	Dieting by missing 1 or more meals a day	142	166	28	11	3	1.76
4	Maintaining weight by balancing caloric intake and exercise	2	5	9	79	253	4.66
5	Engaging in 20 minutes (or more) of aerobic exercise at least 3 times per week	2	4	21	65	260	4.64
6	Eating foods low in salt	2	7	22	121	199	4.45
7	Avoiding or reducing your consumption of fat (eg., fried food, butter)	3	4	16	90	238	4.58
8	Drinking alcohol: 2 drinks or less at one time	34	110	90	80	31	2.90
9	Drinking alcohol: 3 drinks or more at one time	165	143	28	7	3	1.67
10	Using illegal drugs	295	38	11	2	1	1.20
11	Smoking or chewing tobacco	313	33	4	1	1	1.14
12	Drinking more than 4 cups of coffee a day	129	176	38	2	2	1.77
13	Driving too fast	197	117	28	3	1	1.54
14	Driving while influenced by drugs and alcohol	334	12	3	1		1.06
15	Riding in a car going too fast	220	112	15	1		1.42

	Question	VB	SB	U	SG	VG	<u>M</u>
16	Riding with someone influenced by drugs or alcohol	328	17	5			1.08
17	Getting into a physical fight	237	91	15	4	1	1.39
18	Wearing a seatbelt	4	3	11	86	246	4.62
19	Wearing a helmet while riding a bike	4	1	11	83	249	4.64
20	Following traffic regulations while riding your bike	2	1	7	68	272	4.73
21	Carrying a weapon	239	48	49	4	4	1.51
22	Having fun with your parents	4	1	3	69	272	4.73
23	Having fun in any way	4	12	50	89	192	4.31
24	Feeling unhappy	95	196	31	15	9	1.98
25	Seeing your family doctor regularly	5	4	44	174	124	4.16
26	Reading information about health issues	3	5	27	189	123	4.22
27	Relaxing and forgetting about your cares	2	6	24	147	171	4.37
28	Using stress management techniques	2	3	28	126	191	4.43
29	Using time management techniques	2	3	34	150	161	4.33
30	Getting adequate sleep and rest	1	2	1	80	267	4.74
31	Seeking professional help	3	4	56	159	128	4.16
32	Spending quality time with friends	2	3	11	134	199	4.50
33	Spending quality time with family	3	2	6	94	243	4.64

	Question	VB	SB	U	SG	VG	<u>M</u>
34	Liking and feeling good about yourself	3	2	6	64	275	4.73
35	Talking to family members about personal concerns	4	1	30	139	176	4.38

Note: VB = Very bad for health
 SB = Somewhat bad for health
 U = Unsure
 SG = Somewhat good for health
 VG = Very good for health
 M = Mean Score

Appendix C

Student Response Frequencies to the Health Behaviours Scale

Please indicate how often you engage in each of the following behaviours:

	Question	NR	OW	Wy	2-3	Dy	M
1	Eat junk food (eg., candy, chips, etc.)	23	165	117	125	122	3.29
2	Eat a variety of foods from various food groups each day	22	84	136	213	98	3.51
3	Dieting by missing one or more meals	296	119	58	44	35	1.92
4	Maintain weight by balancing caloric intake and exercise	194	125	99	87	41	2.37
5	Engage in 20 minutes or more of aerobic exercise at least 3 times per week	103	112	76	95	164	3.19
6	Eat food low in salt	86	183	137	90	50	2.70
7	Avoid or reduce your consumption of fat (eg., fried food, butter)	92	191	132	90	43	2.64
8	Drink alcohol: 2 drinks or less	263	200	53	26	11	1.77
9	Drink alcohol: 3 or more drinks	316	159	44	21	12	1.65
10	Use illegal drugs	444	68	16	9	16	1.35
11	Smoke or chew tobacco	334	52	10	19	138	2.23
12	Drink more than 4 cups of coffee a day	409	68	35	20	19	1.50
13	Drive too fast	216	133	78	65	48	2.25
14	Drive while influenced by drugs and alcohol	489	23	13	7	8	1.19
15	Ride in a car going too fast	98	202	72	72	105	2.79
16	Ride with someone influenced by drugs or alcohol	472	50	16	6	9	1.25

	Question	NR	OW	Wy	2-3	Dy	M
17	Get into a physical fight	383	139	13	8	10	1.41
18	Wear a seatbelt	24	33	46	123	325	4.26
19	Wear a helmet while riding a bike	320	61	43	51	64	2.03
20	Follow traffic regulations while riding a bike	95	65	81	150	150	3.36
21	Carry a weapon	408	61	32	18	25	1.51
22	Have fun with you parent(s)	60	185	114	110	81	2.94
23	Have fun in any way	12	30	45	97	366	4.41
24	Feel unhappy	64	310	62	64	53	2.52
25	See your family doctor	67	121	255	99	12	2.76
26	Read information about health issues	131	205	91	101	30	2.45
27	Just relax and forget about your cares	66	183	143	103	56	2.82
28	Use stress management techniques	234	121	130	45	27	2.12
29	Use time management techniques	207	137	124	61	28	2.22
30	Get adequate sleep and rest	51	128	151	162	60	3.09
31	Seek professional help	358	65	102	16	14	1.67
32	Spend enough quality time with friends	22	38	92	193	206	3.95
33	Spend enough quality time with family	47	110	136	164	92	3.26
34	Like and feel good about yourself	35	67	122	221	105	3.53
35	Talk to family members about personal concerns	127	143	174	59	53	2.58

	Question	NR	OW	Wy	2-3	Dy	<u>M</u>
36	Let peers pressure you into unhealthy behaviour	303	182	36	15	14	1.65
37	Follow your parents' example of healthy behaviour	109	157	124	119	40	2.68
38	Talk to a caring adult about health concerns	147	132	162	80	36	2.51

Note:

- NR = Never or Rarely
- OW = Once in a While
- Wy = Weekly
- 2-3 = 2 to 3 times weekly
- Dy = Daily
- M = Mean Score

Adult Response Frequencies to the Health Behaviours Scale

Please indicate how often you engage in each of the following behaviours:

	Question	NR	OW	Wy	2-3	Dy	M
1	Eat junk food (eg., candy, chips, etc.)	23	166	75	74	8	2.65
2	Eat a variety of foods from various food groups each day	2	21	76	187	62	3.82
3	Dieting by missing one or more meals	188	111	28	10	9	1.67
4	Maintain weight by balancing caloric intake and exercise	36	81	86	108	32	3.06
5	Engage in 20 minutes or more of aerobic exercise at least 3 times per week	63	112	55	72	46	2.79
6	Eat food low in salt	32	63	84	121	47	3.25
7	Avoid or reduce your consumption of fat (eg., fried food, butter)	14	77	106	122	29	3.22
8	Drink alcohol: 2 drinks or less	103	145	58	29	10	2.12
9	Drink alcohol: 3 or more drinks	204	114	19	7	1	1.51
10	Use illegal drugs	342	3	1		1	1.03
11	Smoke or chew tobacco	259	18	3	2	67	1.85
12	Drink more than 4 cups of coffee a day	140	80	49	47	32	2.28
13	Drive too fast	121	182	31	10	2	1.82
14	Drive while influenced by drugs and alcohol	313	29		1		1.09
15	Ride in a car going too fast	144	174	14	11	5	1.73
16	Ride with someone influenced by drugs or alcohol	319	28	1			1.09

	Question	NR	OW	Wy	2-3	Dy	M
17	Get into a physical fight	339	3	2	1		1.03
18	Wear a seatbelt	7	8	12	37	283	4.67
19	Wear a helmet while riding a bike	125	11	18	37	104	2.95
20	Follow traffic regulations while riding a bike	18	6	21	77	171	4.29
21	Carry a weapon	334	6	2	3	1	1.07
22	Have fun with you parent(s)	1	37	79	116	110	3.87
23	Have fun in any way	4	33	59	116	129	3.98
24	Feel unhappy	29	272	23	17	7	2.14
25	See your family doctor	12	43	167	121	6	3.19
26	Read information about health issues	12	83	49	142	64	3.47
27	Just relax and forget about your cares	23	137	131	44	12	2.67
28	Use stress management techniques	49	89	103	85	19	2.81
29	Use time management techniques	44	67	95	110	30	3.04
30	Get adequate sleep and rest	6	37	93	178	34	3.57
31	Seek professional help	101	58	164	14	5	2.31
32	Spend enough quality time with friends	7	106	119	99	16	3.03
33	Spend enough quality time with family	6	51	117	125	46	3.45
34	Like and feel good about yourself	2	38	66	197	44	3.70
35	Talk to family members about personal concerns	17	72	111	102	47	3.26

	Question	NR	OW	Wy	2-3	Dy	<u>M</u>
36	Let peers pressure you into unhealthy behaviour	235	101	8	1	2	1.37
37	Follow your parents' example of healthy behaviour	38	110	115	68	10	2.71
38	Talk to a caring adult about health concerns	35	98	134	55	20	2.79

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