The Association between Tobacco Control Policies and Marijuana Use among Ontario Undergraduate Students

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DEDICATION

To my Wife, Heather, your never-ending love and support throughout my time as a Master’s student helped fueled this dream of applied research. You helped drive me through the lows of thesis work and truly appreciate the high times of success.

To my Parents, Ian & Beverley, the time each of you have spent raising me has resulted in my completion of a Master’s Degree. For that, I am forever grateful and hope you take great pride in seeing your son succeed in such an endeavour.
ABSTRACT

**Background:** Research indicates a steady increase in marijuana use and that it is concurrent with tobacco. There is speculation this concurrency reaches beyond use, to where policies aimed at reducing one may result in the reduction of the other.

**Purpose:** To investigate the association between tobacco control policies and marijuana use among young adult undergraduates. **Methods:** A stratified sample of Ontario universities resulted in a sample of 4,966 participants. **Results:** Campuses with a moderately strong policy was found to be significantly associated with decreased marijuana use compared to campuses with a weak tobacco control policy. (OR=0.52, 95% CI: 0.36-0.76). **Conclusions:** The findings show tobacco control strategies are related to decreased odds of marijuana use among Ontario undergraduates. These findings are important to both policy makers and researchers interested in health strategies pertaining to marijuana and tobacco use and/or how health policies aimed at reducing one risk behaviour can affect another.
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CHAPTER 1: INTRODUCTION

1.0 Outline

This thesis investigated the association between tobacco control policies and marijuana use among Canadian young adults on Ontario university campuses. Through the review of the literature this thesis identified the Canadian university young adult population as a high risk group for the use of marijuana and that effort to reduce marijuana use among this population is called for. This thesis identified tobacco control policies, successful at reducing tobacco use, as a means of helping to reduce the use of marijuana. Finally this thesis discusses the implications of these findings in the writing of health policies and future research within the fields of marijuana use and tobacco use. The rationale for undertaking this study is as follows.

1.1 Marijuana Use and Young Adults

1.2 Marijuana and Tobacco

Increasingly tobacco and marijuana use have been found to be concurrent behaviours (Patton, Coffey, Carlin, Sawyer & Lynskey, 2005; Amos, Wiltshire, Bostock, Haw & McNeill, 2004; Grunbaum, Kann, Kinchen, Ross, Hawkins, Lowry, Harris, McManus, Chyen & Collins 2004; Leatherdale, Ahmed & Kaiserman, 2006; Leatherdale et al., 2007). In a U.S. college student sample marijuana use was strongly associated with tobacco use (Bell, Wechsler & Johnston, 1997). Young Canadian adults who currently smoke tobacco, are more likely to use marijuana than Canadian young adults who are ex-smokers, or never smokers (Leatherdale et al., 2007). This concurrent relationship was further emphasized by longitudinal research involving a U.S. national sample (Timberlake, Haberstick, Hopfer, Bricker, Sakai, Lessem et al, 2007). Also, research has suggested that marijuana use may escalate tobacco use (Leatherdale et al., 2007) and increase the risk of late initiation of tobacco use and progression to nicotine dependence resulting from marijuana use (Patton et al., 2005). Similarly, tobacco smoking was reported in one study as a consequence of marijuana use and that marijuana use may act as a barrier to smoking cessation (Amos et al., 2004). Finally, marijuana use as little as monthly has been shown to predict continuing tobacco use (Ford, Vu, & Anthony, 2002).

1.3 Control Policies for Marijuana and Tobacco

Measures to decrease the use of marijuana and to decrease the use of tobacco have been approached in two very different ways. The use of marijuana has been regulated by legislation based upon the criminal law power requiring all forms of
marijuana production, distribution and use to be a punishable offence in Canada. The establishment of marijuana prohibition in Canada is considered to be based on no evidence of marijuana-related problems warranting criminalization. The consequences of criminalizing marijuana use are viewed by many as a larger problem than the drug itself (Fischer, Ala-Leppilampi, Single, & Robins, 2003; Grossman, Chaloupka, & Shim, 2002; Erickson, 1999; Erickson 1998; Erickson 1997; Soloman, Single & Erickson, 1983). The cost of applying criminal law to marijuana use falls heavily on the young with the majority of those convicted being under the age of 25 years (Le Dain Commission, 1972; Grossman et al., 2002).

Measures used to control tobacco have not involved the criminal law power but instead has without any form of legislation until recently with age restrictions on the purchase and consumption as well as restrictions on where it may be consumed. Tobacco control research has found clean air restrictions appear to inhibit tobacco smoking by dissuading initiation and supporting smokers to quit. Within post-secondary campuses tobacco control policies have been shown to reduce tobacco smoking among young adults (Dupuis & Lawrance, 2007).

It is suggested that marijuana prevalence may be associated with tobacco control policies. One U.S study indicated that increased taxation of cigarettes and policies aimed at reducing tobacco cigarette use are likely to reduce marijuana use (Farrelly, Bray, Zarkin, & Wendling, 2001). However, currently it is premature to draw conclusions regarding the association of tobacco control policies and marijuana use. Given the concurrent relationship of marijuana and tobacco and the evidence that smoking bans and restrictions in the community and campus influence individuals'
tobacco use, it is of importance to consider the impact tobacco control policies on marijuana use among young adults.

1.4 Gaps in the Literature

The literature review of this thesis has examined the following points in order to create the foundation needed for investigating tobacco control policies’ association on marijuana use.

Although marijuana use is prohibited by law the prevalence of marijuana use continues to climb especially among young adult students. Whether students’ use of marijuana is influenced by tobacco control policies in either the community or campus environment remains an empirical question.

Despite one indication from research conducted in the U.S. that suggested that marijuana prevalence may be associated with tobacco control policies, there is a lack of conclusive research in this area.

1.5 Responses to Gaps in the Literature

With this gap in the literature identified, it would be of importance to examine the possible association between tobacco control policies and marijuana use among post-secondary students. Amidst growing recognition of similarities between marijuana and tobacco in use and in health consequences, it would be of interest to determine if the change in social norms for tobacco use associated with the implementation of tobacco control policies can have a similar effect on changing the social norm of marijuana use among Canadian university students.
1.6 Data Sets

In order to examine the association between tobacco control policies and marijuana use among Ontario undergraduates both in the community and university setting, two unique data sets were selected. The Tobacco Use in a Representative Sample of Post-Secondary schools (TURSOPS) data set is a recent on-line survey of Ontario post-secondary students that assesses tobacco behaviours as well as other substance use behaviours including marijuana use. The second data set known as the tobacco control policy data set includes information on tobacco control policy exposure at both the community and university settings. This policy data set measures correspond with each of the university student respondents within the TURSOPS data set based on the institution they attend, the institution location, the location of high school they attended, their age and year of study.

The following chapter discusses the literature investigating aspects of marijuana use, tobacco use as well as factors associated with each. Additionally, the measures used to control marijuana and control tobacco will be discussed. Finally, the purpose of the study will be discussed.
CHAPTER 2: REVIEW OF THE LITERATURE

In order to identify the young adult population at Canadian universities as a high risk population and that efforts are needed to reduce marijuana use among this population a number of areas of research are reviewed. This includes a description of marijuana and marijuana use, why marijuana use is troubling, associations of marijuana use, correlates of marijuana use and the history of marijuana control and tobacco control.

2.1 Marijuana and Marijuana Use

Marijuana, also known as cannabis, pot, grass, reefer, weed, herb, mary jane, mj, or chronic is a greenish mixture of dried, shredded leaves, stems and seeds from the flowering tops of the female plant known as Cannabis sativa (Statutes of Canada, 1996). According to the National Institute on Drug Abuse (NIDA), marijuana contains a psychoactive product called delta-9-tetrahydro-cannabinol (THC), which is associated with influencing pleasure, memory, thought, concentration, sensory, time perception, and coordinated movement (World Health Organization, 1997). Marijuana’s effect on the user depends on a number of factors, including its strength or potency, which is related to the amount of THC it contains, and how experienced the user is with using marijuana (World Health Organization, 1997).

Marijuana users consume marijuana either through inhalation or ingestion (World Health Organization, 1997). The majority of users inhale marijuana smoke either in cigarette form (joints) or through the use of a water pipe (bongs or hookahs). Marijuana is sometimes taken orally by mixing marijuana leaves, stems and seeds in with other foods (World Health Organization, 1997).
The most widely used illicit drug in Canada is marijuana (Adlaf et al., 2003b; Adlaf, Begin & Sawka, 2005; Leatherdale et al., 2007), 45% of adults aged 18 years and older reporting marijuana use at least once during their lifetime and 14% reporting using marijuana in the past year (Adlaf et al. 2005).

2.2 Why Marijuana Use is Troubling

There are a number of reasons why marijuana use is troubling. Marijuana use is associated with negative health consequences and contributes to tobacco use (also known to be associated with negative health consequences).

The literature suggests that chronic marijuana use may produce selective impairments of cognitive functioning, exacerbate schizophrenia in affected individuals, impair pulmonary defences against infection and cause airway injury and chronic bronchitis (Aldington, Harwood, Cox, Weatherall, Beckert, Hansell, Pritchard, Robinson, Beasley, 2008; Iversen, 2005; Tashkin, Baldwin, Sarafian, Dubinett, & Roth, 2002; Tashkin, Gliederer, Rose, Chang, Hui, Yu, Wu, 1991).

Marijuana use by post-secondary students can cause health, academic, social, personal, and legal problems (Gliksman, Allison, Adlaf & Newton-Talyor, 1995). Marijuana use "hangovers" can lead to fatigue and potential injuries from accidents that can impede learning, contribute to a decline in academic performance, and loss of interest in extra-curricular activities (Gliksman et al., 1995). Socially, the loss of friends, deterioration in social functioning, estrangement from family members, and conflicts with authority can occur (Gliksman et al., 1995). Personal problems associated with marijuana use can include deterioration in self-image, and feelings of powerlessness, depression, alienation, and even suicide (Gliksman et al., 1995).
Glikson and colleagues (1995) point out that drug related offenses resulting in a criminal record, can have a lasting implication on a student’s life course. The economic and social costs of marijuana use are reflected in the numbers, and consequences, of criminal convictions handed down to marijuana users. The punitive approach to drug use in Canada has resulted in deportation, heavy incarceration, and criminal records dating back to the early 1900s (Erickson, 1997; Erickson 1998; Erickson 1999; Fischer et al., 2003; Grossman, Chaloupka, & Shim, 2002; Soloman, Single & Erickson, 1983).

In addition to negative health consequences, marijuana use is also associated with tobacco use (Amos et al., 2004; Bell et al., 1997; Ford et al., 2002; Grunbaum et al., 2004; Hammersley & Leon, 2005; Highet, 2004; Leatherdale et al., 2006; Leatherdale et al., 2007; Patton et al., 2005; Timberlake et al, 2007). The linking of marijuana use to tobacco use is highly troubling as tobacco use is considered the single most preventable cause of death worldwide (World Health Organization, 2008). The WHO considers tobacco use to be the second major cause of death and the fourth most common risk factor for disease worldwide (WHO, 2008). Health Canada has reported that tobacco use in Canada results in 47,000 premature deaths annually (Health Canada, 2006b), and that of this total, 1,000 deaths occur in non-smokers as a result of exposure to environmental tobacco smoke (Health Canada, 2006b).

2.3 Marijuana Use among Young Adults

In the Canadian young adult population marijuana is the illicit drug of choice (Adlaf et al, 2005). In 2004, 47% of Canadians aged 15 years and older self-reported
marijuana use in the past year compared to 23% in 1994 (Adlaf et al., 2005). This study also indicated an increase in the prevalence of marijuana use over the past year for both the Canadian adult population in general, as well as the Canadian undergraduate population. Within the post-secondary, young adult population, Adlaf and colleagues (2003b) found that marijuana is the most widely used illicit drug with 29% indicating past year marijuana use.

American national surveys generally conclude that marijuana is the illicit drug of choice among university students. The 1999 Campus Alcohol Survey (CAS) reported that 27% of U.S. college students had used marijuana in the past year (Gledhill-Hoyt, J., Lee, H., Strote, J., & Wechsler, H, 2000), and the 2001 Monitoring The Future (MTF) study found that 36% of U.S. students had used marijuana in the past year. All other illicit drug use among U.S. college students did not exceed 5% for either study.

2.4 Correlates of Marijuana Use

Factors influencing marijuana use for both Canadian young adults and Canadian young adult undergraduates include sex, age, alcohol use, living arrangement, and tobacco use (Adlaf et al., 2005; Adlaf et al., 2003; Leatherdale et al., 2007). The following section examines how each factor is associated with marijuana use.

2.4.1 Gender and Marijuana Use

Marijuana use differs by gender. Among Canadian young adults (age 20-24 years), Leatherdale and colleagues (2007) found males had a higher prevalence of marijuana use (32%) than females (22%) in the past year, and the prevalence of lifetime use for males was 54% compared to 49% in females (Leatherdale et al., 2007). In addition,
Leatherdale and colleagues (2007) found males were more likely than females to report using marijuana in the past year (OR=1.58, 95% CI 1.43-1.76). Similarly, Swift et al, (2008), using a 10-year representative prospective study following an Australian sample, found adolescent males were not only more likely than females to have tried cannabis, but were also twice as likely to be problematic users at age 24 compared to their female counterparts.

In the college and university setting, similar conclusions have been made. Bell and colleagues (1997), using a nationally representative U.S. college sample under the age of 24 years, found females were 0.79 (95% CI: 0.73-0.84) times as likely to use marijuana compared to their male counterparts.

### 2.4.2 Age and Marijuana Use

Marijuana use may also differ by age. Longitudinal data from the U.S. suggest age is related to the onset of marijuana use, with young adults being more likely to have used marijuana in the past 30 days than adolescents (Brook, Kessler, & Cohen, 1999). In Canada, Leatherdale and colleagues (2007) found rates of marijuana use (in the past 12 months) were higher among 20-24 year olds than 15-19 year olds (27% vs. 24%). Bell and colleagues (1997), using a nationally representative sample of American college students and controlling for other significant student characteristics associated with marijuana use, found being under the age of 24 was predictive of marijuana use in college students. However, within the Canadian post-secondary setting, Adlaf and colleagues (2003b) found age not to be a significant predictor of marijuana use among Canadian post-secondary undergraduates.
2.4.3 Alcohol Use and Marijuana Use

Marijuana use correlates with alcohol use. Bell and colleagues (1997), using a nationally representative sample of U.S. college students, found students who report they "binge drink", had more than three times higher risk of using marijuana compared to those who did not binge drink. Hammersley and Leon (2005) examined a United Kingdom cohort of university students to determine patterns of marijuana use; they found that 34% of respondents utilized marijuana and alcohol in combination to intensify the effects.

2.4.4 Marijuana Use in the University Environment

Compared to living at home, the university setting is a physical and social living arrangement conducive to elevated health-risk behaviours, including heavy drinking, cigarette use, and illicit drug use (Adlaf et al., 2003b; Glickman, Newton-Taylor, Adlaf, & Giesbrecht, 1997; Hammond, 2005).

In an examination of living arrangements, Adlaf and colleagues (2003b) found that students living at home with family reported lower rates of drug use compared to those living in fraternities or sororities. For students living on campus, 36% of students indicated marijuana use in the past month, compared to 32% of those living off campus without parents, and 25% for those living off-campus with parents. A logistic regression model indicated those not living with parents were about 1.5 times more likely than those living with parents to have used marijuana (Adlaf et al., 2003b).
Although research to date would suggest household members influence the initiation of both marijuana (Lee et al., 2007) and tobacco use (Emmons, Wechsler, Dowdall & Abraham, 1998), no study to date in either the U.S or Canada has investigated if living with a tobacco smoker is associated with marijuana use among post-secondary students. This gap in the literature warrants further investigation.

2.4.5 Marijuana and Tobacco

There is increasing evidence tobacco and marijuana use are concurrent behaviours (Amos et al., 2004; Bell et al., 1997; Ford et al., 2002; Grunbaum et al., 2004; Hammersley & Leon, 2005; Highet, 2004; Leatherdale et al., 2006; Leatherdale et al., 2007; Patton et al., 2005; Timberlake et al, 2007). A study of a national sample of U.S. college students (17-24 years old) found marijuana use was strongly associated with tobacco use (Bell et al., 1997). Similarly, Leatherdale and colleagues (2007), using a national sample of young Canadians (17-24 years old), determined those who currently smoked tobacco were more likely to use marijuana than those who previously tobacco smoked, or never smoked tobacco, with 34% of current tobacco smokers using marijuana compared to 17% of ex-smokers, and 11% of never smokers.

These correlates of marijuana use suggest that young (17-24 years old) post-secondary students may be a subpopulation that is particularly likely to use marijuana. With the Canadian university young adult population identified as a high risk group for marijuana use, as well as the negative health consequences associated with marijuana use, clear efforts are needed to reduce marijuana use among this population.
2.5 Marijuana Control and Tobacco Control

In developing strategies to reduce marijuana use in the young adult university population, it may be informative to consider how marijuana use and tobacco use have been controlled to date. The following section describes how marijuana and tobacco have been controlled in the past, and the results from these control measures in terms of use.

2.6 History of Illicit Drug Control in Canada.

Canada’s history of illicit drug control has been heavily influenced by international conventions and treaties dating back to the early 1900s. The Opium Act of 1908 was Canada’s first anti-drug law. According to most social historians, it was enacted to provide control for Asian immigration, to regulate trade and to ensure that physicians were seen as protectors of national health (Boyd, 1991; Carstairs, 2006; Fischer, Ala-Leppilampi, Single, Robins, 2003; Malleck, 1997). In 1923, the Opium Act was renamed the Opium and Drug Act, and was expanded to include a number of other psychoactive substances, including marijuana. The establishment of marijuana prohibition in Canada had no actual basis as there was no evidence of marijuana-related problems warranting criminalization (Giffen & Lambert, 1991). Some authors have stated that the criminalization of marijuana in Canada stems from the American “reefer madness” campaign during the 1930s (Giffen & Lambert, 1991; Whitaker, 1969). In terms of international responsibilities, presently Canada is obliged by the International Single Convention on Narcotics Drugs (1961) to limit the production, distribution, and use of marijuana to only medical and scientific purposes (Statutes of Canada, 1996). The Convention defines marijuana as: “the flowering or fruiting tops
(excluding the seeds and leaves when not accompanied by the tops) of the plant scientifically known as *Cannabis sativa* from which the resin has not been extracted; cannabis resin or hashish; and cannabis plant” (Statutes of Canada, 1996). Since the control measures called for by the Single Convention are limited to medical and scientific purposes, all other forms of production, distribution, and use of marijuana are a punishable offence in Canada.

In 1968, the Liberal government of Canada established the Commission of Inquiry into the Non-Medical Use of Drugs (more commonly known as the Le Dain Commission). This Commission studied various aspects and issues of drug use, treatment, and control, and made recommendations regarding policy and statutory reform of the Canadian Drug Control Act. In addition to the summary report, the Le Dain Commission produced a report specifically addressing cannabis use. This "Cannabis Report" concluded criminal prohibition of marijuana was an ineffective, costly tool for controlling marijuana use among Canadians (Information Canada, 1972). The commission recommended to the federal government to initiate discussions with the provincial governments to have the sale and use of cannabis placed under controls similar to those used to govern the sale and use of alcohol. Although the reports published by the Le Dain Commission did not result in any political movement toward amending Canada’s drug control policy, the consequences of criminalizing marijuana use became viewed as a larger problem than the drug itself (Erickson, 1997; Erickson 1998; Erickson 1999; Fischer et al., 2003; Grossman, Chaloupka, & Shim, 2002; Soloman, Single & Erickson, 1983). In the late 1990s, support for marijuana decriminalization resulted in Bill S-19, which proposed to limit penalties for marijuana possession to a $100 fine with no
imprisonment, and to eliminate criminal records through an automatic discharge system (Fischer et al., 2003). Bill S-19 was approved by the Canadian Senate, but later died in the House of Commons, leading to the status quo with marijuana use being a criminal offence to this day.

2.6.1 Current Marijuana Legislation in Canada

This status quo nature of penalties associated with marijuana use in Canada is covered by the 1996 Controlled Drugs and Substances Act (CDSA), which focuses on a punitive approach to drug use (Statutes of Canada, 1996). Currently, possible penalties include incarceration and/or a fine, plus a criminal record for marijuana possession. However, while sentencing in the past for marijuana possession was often the maximum of seven years, the CDSA now calls for a maximum of six months imprisonment and/or a maximum of a $1,000 fine for first time offenders. Repeat offenders face double these amounts (Statutes of Canada, 1996).

2.6.2 The Costs of Applying Criminal Law to Marijuana Use

According to the Le Dain Commission (1972), the cost of the criminal prohibition of marijuana falls heavily on the young. The Commission found that 50% of Canadians convicted in 1970 and 1971 for simple possession of marijuana, were under the age of 21 years. Furthermore, 85% of those convicted of all marijuana related offences in 1970 and 1971 were under the age of 25 years. In the U.S., more recent conviction rates for marijuana use or possession indicated a similar trend with the young adult age group holding the majority of convictions (Grossman et al., 2002). According to Grossman and colleagues (2002), 10% of all arrests in the United States are for drug
offenses, with 40% of these drug offenses involving marijuana use, and half of the offenses being committed by juveniles.

The involvement of youth and young adults with the criminal law process can be damaging to the developmental life choices faced by this age group (Grossman et al., 2002; Information Canada, 1972). The consequences of youth and young adults being involved with the criminal process can include: criminal convictions, jail time, the loss of right to travel, and the potential for loss of future employment opportunities (Grossman et al., 2002; Information Canada, 1972). It would seem in terms of young adults, efforts need to be made to reduce the prevalence of marijuana use through education and specific policies rather than criminalization, incarceration, and fines or use policies first and then criminalization as a last resort.

2.7 History of Tobacco Control in North America

In the recent past, research has clearly shown the health risks associated with tobacco use. This has resulted in the development and implementation of tobacco control measures by the federal, provincial/state, and local levels of government. Looking back at these efforts to reduce tobacco use, three distinct "waves" can be recognized (Public Policy Sources, 2000). The first wave involved education about the harms of tobacco use and the dangers of exposure to second hand smoke. The second wave, which involved the regulation/control of the availability of tobacco products and on smoking itself, is still not complete as smoking regulations continue to be implemented at the local, regional and national levels both in Canada and the U.S. A third wave involving legal action against the tobacco industry has begun.
2.7.1 Regulation of Smoking

It is thought that due to the clean air policy restrictions, smokers have less opportunity to smoke, which would in turn reduce the number of cigarettes consumed, and would eventually lead to the possibility of quitting (Levy & Friend, 2003). Furthermore, clean air policies are thought to make tobacco smoking less attractive, which would lead to changes in the perception that smoking is a social acceptable behaviour (Levy & Friend, 2003).

2.7.2 Effects of Smoking Restrictions on Tobacco Use

In the recent past, a number of studies have been conducted in the United States examining the effects of community based clean air policies on adult tobacco consumption (Chaloupka, 1992; Emont, Choi, Novotny & Giovino, 1993; Forster, Widome & Bernat, 2007; Levy, Hyland, Higbee, Remer & Compton, 2007; Levy et al., 2004; Levy & Friend, 2001; Moskowitz, Lin & Hudes, 2000; Rigotti, Regan, Majchrzak, Knight & Wechsler, 2002; Yurekli & Zhang, 2000).

Emont and colleagues (1993) conducted one of the first and most comprehensive studies on tobacco use and clean air policies. This study examined the relationship between state-level smoking restrictions and smokers’ tobacco consumption and cessation rate. Using data from the U.S Population Survey for Prevalence and Quits (1989), Emont et al. found that U.S. states with extensive smoking restrictions had a 14% lower prevalence of smoking, a 12% lower per capita tobacco consumption rate, and a 12% higher cessation rate, compared to states with less extensive smoking restrictions.
Using data from the Tobacco Institute (1970-1985), Chaloupka and Saffer (1992) found that tobacco consumption was 4 to 8% lower for smokers living in states with extensive smoking restrictions compared to states with less extensive smoking restrictions. U.S. population-based studies of clean air policies have been conducted by both Yurekli and Zhang (2000), and Moskowitz and colleagues (2000). Assuming that clean air laws would have had a gradually growing impact on smoking over time, Yurekli and Zhang (2000) created an index that factored in the strength and duration of the clean air laws. They found that more comprehensive clean indoor air policies significantly reduced per capita cigarette consumption (i.e., effect of longer duration clean air policies). Using data from the California Tobacco Survey (1990), and classifying local ordinances in California as weak, moderate, or strong, Moskowitz and colleagues (2000) found a 38% higher quit rate among smokers who lived in communities with strong local ordinances compared to smokers who lived in communities with weak local bylaws.

In terms of young adults, Tauras (2004) used the Monitoring the Future dataset to examine the impact of both tax increases and clean air restrictions on smoking cessation. He found stronger restrictions on smoking in private worksites and public places, other than restaurants, were more likely to have a positive impact on young adult smoking cessation compared to weak restrictions.

2.7.3 Tobacco Control Policies in Specific Settings

The literature reviewed here indicates that all members of the community benefit from smoking restrictions at the local and provincial/state level. Globally, tobacco
control policies reduce health risks associated with the exposure to environmental tobacco smoke, as well as decreasing the frequency of tobacco use (WHO, 2003).

Over the past two decades in the U.S. and Canada, popular support for clean indoor air laws have resulted in the spread of clean air laws to nearly every community in North America (Health Canada, 2008). However at present, the comprehensiveness of clean air laws varies considerably from jurisdiction to jurisdiction. In Ontario, the variability in clean air policies persists because of the limitations of provincial law. Local by-laws used to address tobacco use rarely do so in a uniform manner (Ontario Municipal By-Law Report, 2005). As such, community by-laws in Ontario exhibit considerable variability in strength and duration.

2.7.4 Tobacco Control Policies in the University Environment

In the post-secondary setting, there is considerable variability in the protection offered through clean air policies from province to province (Hammond, 2005) and from state to state (Rigotti, Moran & Wechsler, 2005). In Ontario, provincial law requires post-secondary campuses to ban smoking in public areas inside campus buildings. University campus restrictions focus on smoking in campus residences, smoking in outdoor areas on campus property, the sale of tobacco, and contractual agreements with tobacco companies, are the responsibility of each institution. Research has found that most post-secondary campuses are tobacco-friendly environments (Hammond, 2005; Lantz, 2003). Dupuis and Lawrance (2007) examined the relationship of Canadian tobacco control policies and tobacco smoking status among young adults. They found a relationship between the strength of campus tobacco control policy and smoking status such that a weak campus tobacco
control policy was related to an increased odds of being both a daily smoker (OR=2.08, 95%CI: 1.31-3.30). In addition, a student's exposure to a campus tobacco control policy was related to smoking status (OR=0.93, 95%CI: 0.90-0.96).

As mentioned above, research has found that campus environments are tobacco friendly (Hammond, 2005; Lantz, 2003). Within campus environments, living arrangements and social situations may encourage smoking initiation and escalation (Von, Ebert, Ngamvitroj, Park & Kang, 2004).

Research from the U.S. suggests that smoke-free residences offer a possible means of reducing or preventing tobacco initiation and escalation (Wechsler, Lee & Rigotti, 2001). Smoke-free residences may act as a tool for promoting the initiation of smoking by limiting the opportunity and time to smoke, and by reducing the influence of smokers on their non-smoking peers. Wechsler and colleagues (2001) examined a representative sample of U.S. university students from 101 institutions to determine whether students living in smoke-free residences were less likely to smoke cigarettes compared to students living in campus housing with no smoking restrictions. Smoke-free residences were defined as dormitories or floors specifically designated by the school as smoke-free living arrangements where all students living in that area were prohibited from smoking. Students not living in these designated areas were defined as residents living in unrestricted housing. The results indicated that current smoking prevalence was significantly lower among residents of the smoke-free residences (21%) compared to the residents of the unrestricted housing (31%).

Adlaf et al. (2003) examined tobacco use among Canadian students living on campus and off campus. Although they did not account for smoking restrictions in on campus housing, it was found that students living off campus without parents had a higher
rate of daily smoking (1.5 times higher) than those living on campus in a university residence.

2.8 Literature Summary

The review of the literature identifies the young adult population at Canadian universities as a high risk population for marijuana use. Through a description of the increasing prevalence of marijuana use as well as the negative health consequences associated with marijuana use, a need for the reduction in the use of marijuana among this population has been identified. With the literature indicating tobacco use and marijuana use are concurrent, there is speculation the concurrency of marijuana and tobacco reaches beyond use to where policies aimed at reducing one may result in the reduction of the other. The literature reviewed indicates tobacco control policies have been found to change the social norm of tobacco use. Farrelly and colleagues (2001) have suggested tobacco control policy may be associated with reducing marijuana use. They argue marijuana use could be reduced by tobacco control initiatives. However, only the impact of cigarette taxation on the prevalence of marijuana use as been examined (Farrelly et al, 2001). With the increasing prevalence in marijuana use among Canadians and the punitive approach used in Canada’s current marijuana legislation, efforts are needed to investigate if tobacco control policies can help dissuade marijuana use.

2.9 Purpose of the Present Study

Based on the gap identified in the literature, the aim of the present study is to determine whether tobacco control policies in the home town, in the university town
or within the university campus are related to the prevalence of marijuana use among Ontario young adult undergraduates.
CHAPTER 3: STUDY OBJECTIVES

In order to address the identified gap in the literature the following has been addressed. First, the prevalence of marijuana use among Ontario university students was described. Second, correlates of marijuana use were examined. Third, the relationships between home town by-laws (strength of, duration of and exposure to), university town by-laws (strength of, duration of and exposure to) and university campus tobacco control policies (strength of, duration of and exposure to) and marijuana use were explored. Finally, a summative model including all behaviours closely associated with marijuana use as well as all avenues of tobacco control policies was created. The following research questions are addressed:

3.1 Research Questions

1. What is the prevalence of (a) marijuana use among Ontario undergraduates? and (b) the concurrent use of marijuana and tobacco among Ontario undergraduates?

2. Of the following demographic characteristic variables - gender, living arrangement, alcohol use, tobacco use, living with a smoker, age, which are associated with marijuana use and to what degree are they associated with marijuana use among Ontario undergraduates?

3. While controlling for correlates of marijuana use (gender, tobacco use, alcohol use, living arrangement, living with a tobacco smoker, and age), to what degree is each characteristic (strength of, duration of, exposure to) of home town, university town and campus tobacco control policies associated with students’ marijuana use?
4. While controlling for correlates of marijuana use (gender, tobacco use, alcohol use, living arrangement, living with a tobacco smoker, and age), what are the unique associations of the policy variables identified above on students’ marijuana use?

5. While controlling for correlates of marijuana use (gender, tobacco use, alcohol use, living arrangement, living with a tobacco smoker, and age), are there any significant interactions between policy variables identified above (i.e., campus policy strength and university town policy strength) and students’ marijuana use?
CHAPTER 4: METHODOLOGY

4.1 Overview

The data sets used in this study were the Tobacco Use in a Representative Sample of Ontario Post-Secondary Students (TURSOPS) data set and a researcher generated policy measure data set corresponding to the TURSOPS data set.

4.2 TURSOPS Data Set

The TURSOPS data were collected between November 2005 and January 2006 by researchers from both Brock University and the University of Waterloo. Representing a cross-sectional study, the TURSOPS data provide information on post-secondary students’ cigarette consumption, marijuana use, alcohol use, and other health risk behaviours. Because the current study addresses only university students, procedures for collecting data from university students (but not college students) are described here.

4.2.1 Institution Selection

The target population for the TURSOPS dataset included all students from all 21 publicly-funded universities in Ontario except those where the primary language of instruction was French (n=3) and those that were privately-funded (n=1). A stratified random selection procedure was used to generate a representative population of schools. Geographic divisions employed by the Ontario Ministry of Training, Colleges and Universities were used to divide Ontario into four geographic strata that included: Eastern, Northern, Central, and Western. Within each of the strata, English language, publicly funded universities were randomly selected. Overall, 12 universities were initially selected and provided the opportunity to refuse
participation. A second sample of 4 universities was also randomly selected across the strata as back-ups for any institutions that refused to participate. Refusal to participate by an institution could have occurred by either the Registrar’s Office declining to support the study or failure to obtain Research Ethics Board (REB) clearance at the institution.

In order to obtain approval of the university’s Registrar’s Office, a Research Coordinator contacted each institution and spoke to the Registrar’s Office by telephone to introduce the study. Detailed written information regarding the research and role of the Registrar’s Office in the study was sent immediately following the initial call. A second phone call was then made to ascertain whether the Registrar’s Office would send a one-time mass email to all full-time undergraduate students at the given institution. While collaboration was sought with the Registrar’s Office, REB clearance was pursued in order to expedite the school selection process. Only schools where there was agreement by the Registrar’s Office and clearance was obtained from the REB were included in the study. (See Appendix A for the REB clearances of all participating institutions).

From the 12 universities originally selected, one declined to participate. Ultimately, three “back-up” universities were contacted for participation in the study; one of these universities declined to participate. This resulted in 13 universities participating in the study. Figure 1 identifies the population of universities that were selected for and participated in the study.
Figure 1. Ontario Universities selected to be in the TURSOPS data set.
4.2.2 Survey Administration

The Registrar’s Office at each participating institution was supplied with the introductory invitation to participate letter. At each participating institution, personnel from the Registrar’s Office generated a list of student email addresses (either individual or list-servs) using the registration software. The Registrar personnel then sent out the invitation to all full-time undergraduate students. No follow-up invitations or reminders were sent to participants. All students who received the invitation were eligible to complete the online questionnaire. Included in the introductory invitation was a brief description of the study, an invitation to participate, a hyperlink to the survey website, and the institution access code for the survey.

Students who were interested in the study clicked the hyperlink to access the website for the online questionnaire. The questionnaire website provided students with more detailed information regarding the purpose of the study and the nature of their participation in it. (See Appendix C for the information letter). Students who wished to participate simply granted consent by selecting the appropriate button on the screen (i.e., I consent to participate (agree); I decline (exit)). Participants who accessed the questionnaire were asked to input their institution code and then respond to the questionnaire items. Participants who accessed the online questionnaire were eligible for a prize draw regardless of whether they withdrew from the study during or after completion (See Appendix B for the content of introductory invitation email). The prize was a 1-in-10 chance to win a $10 electronic gift certificate for Chapters Bookstore. Participants entered the prize draw by accessing the survey site and either completing the questionnaire or indicating their withdrawal from the study.
While completing the questionnaire, participants had the ability to track their progress to completion by viewing the icon located at the bottom of the screen. The questionnaire generally took about 15 minutes to complete. After submitting their questionnaire (or with-drawing), participants viewed a thank you letter which stated that a full summary of the results of the study would be posted on the website (www.youthvoice.ca) and thanked the participant for taking the time to participate in the study.

4.2.3 Initial Sample

As a result of inviting all full-time undergraduate university students at the 13 participating institutions, a sample of 7,585 participants was produced. Assuming all 144,422 eligible students received the email invitation, the response rate was approximately 4.7%. Due to technical errors when downloading data from the online data reserve to a Microsoft Excel format, 600 cases were deemed lost. Furthermore, 119 were lost due to respondents clicking on the wrong on-line questionnaire (i.e., not the TURSOPS study). Once all systematic errors in responses were excluded, the total sample consisted of 6,866 university students.

4.2.4 Measures

The TURSOPS questionnaire is available in Appendix D. The variables used in the present study for analysis are presented and described below.

4.2.4.1 Demographic Characteristics

Respondents reported their sex (male, female); age (in years); whether they lived with a smoker (yes, no); where they lived (in campus residence, at my family’s home, at a relative’s home, with another family (boarding), off campus alone, off
campus with other students, off campus with non-students, off campus with students and non-students, off campus with romantic partner). The "where they lived" responses were collapsed into three categories: living on campus (‘campus’), living with parents off campus (‘family home’), and living off campus (‘off campus’).

4.2.4.2 Substance Use Behaviours

In order to assess tobacco use, students were asked, “Do you currently smoke, even just a bit?” (yes, no). Respondents who answered yes were considered to be tobacco smokers.

To assess marijuana use, students were asked, “In the past 30 days, how often did you use cannabis?” (every day, almost every day, on some days each week, once or twice all together, not at all). Respondents who answered any frequency except ‘not at all’ were considered to be marijuana users.

In order to assess alcohol use, students were asked, “In the past 30 days, how often did you use alcohol?” (every day, almost every day, on some days each week, once or twice all together, not at all). Respondents who answered ‘not at all’ were considered as non-consumers of alcohol; any other response resulted in the respondent being categorized as an alcohol user.

4.3 Tobacco Control Policies Data Set

This data set was created by Ms. Sandy Dupuis and Dr. Kelli-an Lawrance, and included measures of municipal/regional clean air by-laws for the home towns of participants, municipal/regional clean air by-laws of the cities in which the sampled universities were located, as well as the campus tobacco control policies of each sampled university. The strength of the by-law policy, how long (in months) that the
by-law policy was in effect, and participants’ duration of exposure to the by-law policy were determined in the following manner for each of the three clean air-policies.

4.3.1 Municipal/Regional Clean Air By-Laws

Information regarding municipal/regional by-laws for home towns and university towns was obtained from the Ontario Municipal By-Law Report (February 2005). Included in this report is a detailed description of the smoke-free by-laws in each of Ontario’s 445 municipalities. The report categorized by-laws in the following manner: (1) 100% smoke-free public places (usually with restrictions on smoking in some workplaces); (2) restricted smoking in public places (usually with some restrictions on smoking in some workplaces); (3) smoke-free municipally-owned buildings (usually with some restrictions on smoking in some public places or workplaces); (4) no by-laws; and (5) “proprietor’s choice”. Dupuis & Lawrance (2007) categorized these policy characteristics to match those found in the Ontario Municipal By-Law Report (February 2005) for each TUROPS respondent.

4.3.1.1 Municipal By-Law Strength.

The strength of each municipal by-law was defined according to the standard set out in the Ontario Municipal By-Law Report (February 2005). Strength was defined into levels: weak, moderate, and strong. A strong municipal by-law was required to have 100% smoke-free public places, with no designated smoking rooms (DSRs) in restaurants, bars, bowling alleys, billiard halls, and bingo halls. A moderate strength municipal by-law was defined as having 100% smoke-free restaurants, but allowing DSRs and smoking in bars, bingo halls, bowling alleys, or billiard halls. Finally, those
municipal by-laws that only restricted smoking in municipally-owned buildings (libraries, civic centers, community centers, recreational complexes, administrative offices/buildings, town halls, and other municipally owned or operated facilities), or made no restrictions on smoking at all were considered as being weak. Additional information on the classifications of municipal by-law strength can be found in Appendix E.

4.3.1.2 Duration of Municipal By-Law

The duration of the municipal by-law was defined as the length of time the most restrictive version of the municipal by-law had been in effect. This time period (measured in months) was obtained through the Ontario Municipal By-law Report, February, 2005.

4.3.1.3 Participant’s Exposure to the By-Law

4.3.1.3.1 Home Town By-Law. How long participants experienced the clean air by-laws in the municipality in which they grew up (i.e., attended high school) was estimated using three pieces of information. The participant’s age, year of study, and the date the most restrictive form of the hometown by-law came into effect were used to compute the participant’s exposure to the by-law. First, the year the participant entered university was calculated using the participant’s age and the participant’s year of study. Then, using the year the participant entered university and the date the by-law came into effect, how long (in months) the participant lived under the most restrictive home town by-law was calculated.

4.3.1.3.2 University Town By-Law. How long participants were exposed to the clean air by-laws in the municipality where they attended university was estimated using
the participant’s age, year of study, the date the most restrictive version of the local (i.e., university town) by-law came into effect, and the date the TURSOPS survey was administered. These pieces of information were used in the following manner: if the university town by-law came into effect after the student entered university, participant exposure was equal to the number of months between the date that by-law came into effect and the date the TURSOPS survey was administered (i.e., January 2006). If the university town by-law came into effect before the student arrived on campus, the participant exposure was simply equal to the number of months the student had been attending university.

4.3.2 Campus Policies

A web-based search was performed to determine each university’s policy related to tobacco and smoking. If web-based data were not available, a university administrator was contacted to obtain the required information. For campus policies, all aspects of tobacco control were taken into account, including indoor and outdoor smoking restrictions, as well as tobacco sales, tobacco advertising and sponsorship contracts with tobacco companies.

4.3.2.1 Campus Policy Strength

Similar to the measurement of municipal/regional by-law strength, campus policy strength was categorized into three levels: weak, moderate, and strong. A weak campus tobacco control policy allowed smoking in designated indoor areas (student residences, and the campus pub) as well as outdoor areas. A campus tobacco control policy that completely banned indoor smoking, restricted outdoor smoking, but did not regulate tobacco sales or advertising on campus was labeled as moderate. Finally,
a campus tobacco control policy that completely banned smoking indoors, limited smoking exclusively to designated outdoor areas, and banned on campus sales and advertising of tobacco was considered strong. Each institution received a measure of strength of tobacco control policy based on the criteria above. This measure of strength was then applied to all respondents from each campus.

4.3.2.2 Duration of Campus Policy

Similar to the measurement of municipal/regional by-law duration, the duration of campus policy was defined as the length of time (in months) that the most restrictive form of campus policy had been in place at the university. This computation was generated based on the information obtained from the university websites or from the information provided by university administrators.

4.3.2.3 Participant’s Exposure to the Campus Policy

How long a student experienced the campus tobacco control policy was calculated through the student’s self-reported ‘year of study’ measure and the number of months the campus policy had been in place. The smaller of the two values represented how long the student had experienced the campus tobacco control policy. Participants’ exposure was counted in months, consecutively and did not account for time away from campus (breaks, co-op placements, etc).

4.4 Merging Data Sets

Using the TURSOPS data set, each participant's home town was determined based on where they attended high school. The university town was determined on basis of where they were attending university. The corresponding municipal by-law data was then matched to the participant based on this information (i.e., home town &
university town). Campus policy data were determined for each participant through the TURSOPS data on the participants' institution. These matching processes resulted in the final merged data set used in this study.

4.5 Analytic Strategy

All statistical analyses were run using the statistical package SAS 9.1. All tests were two-tailed with an alpha value set at a 0.05 for level of significance.

4.5.1 Screening

Screening of the data was performed using a number of criteria. One University had fewer than 50 respondents who completed the survey and were not included in the final sample. This was done to protect the anonymity of these participants.

Participants who indicated they attended high school outside of Ontario were excluded from the sample (n=489). This was done because these participants would not have had any measure for the duration of home town by-law and the strength of home town by-law as these measures are based on smoking by-laws implemented in the province of Ontario only. Finally, students outside the age range of 17-24 years were excluded (n=780) in order to create a sample of young adults who followed the typical path from high-school to university.

4.5.2 Cleaning

Standard cleaning procedures were used to screen variables of interest for any systematic response errors due to the online nature of the survey sampling method of the TURSOPS data set. Likewise, cleaning procedures were used to screen variables of interest of the tobacco control policies data set for any systematic errors in the
entry of policy measures. Frequencies were generated for variables of interest to
determine missing data in the full (merged) data set.

4.5.3 Attrition Analysis
Analysis comparing participants with and without missing data were performed on
the unweighted data to determine if the excluded participants differed significantly
from the participants retained for the remaining analyses.

4.5.4 Representativeness of Data
Through the use of an institution-level sampling procedure, a representative sample
of universities was created. The representativeness of the students recruited from
each institution was assessed according to Dupuis and Lawrance (2007), and it was
determined that a weighting procedure was needed for both recruitment size for each
school and gender distributions.

4.5.4.1 Data Weighting
Dupuis and Lawrance (2007) assessed whether the sample from each school was
representative of the particular institution in terms of gender distribution. Gender
distributions for each institution were assessed using an online information tool
called the Common University Data Ontario (CUDO) data repository. Dupuis and
Lawrance determined that the samples were not representative. Therefore, procedures
for complex survey designs were employed to provide the appropriate weighting.
Weights were scaled to sample size for the analyses of specific subsamples, and
variance estimates were adjusted to take into account the effects of the complex
survey design.
Likewise, since the response rates from each school did not correspond to the size of the institution, the data were weighted to minimize any potential biases created by differential response rates between genders and across schools and strata. Weighting was done (a) to adjust for non-responses within each campus, (b) to match the population gender distributions to gender distribution of samples within each campus, and (c) to ensure that the sample distribution corresponded to the population distribution of the four strata.

4.5.5 Analyses

Each of the research questions was addressed by employing an analysis appropriate to answer that question as described following each research question.

1. What is the prevalence of (a) marijuana use among Ontario undergraduates? and (b) the concurrent use of marijuana and tobacco among Ontario undergraduates? To answer the first research question, descriptive analyses were run to fully describe the patterns of marijuana use, tobacco use, and concurrent use. The various frequencies describe the prevalence of marijuana and concurrent use.

2. Of the following demographic characteristic variables - gender, living arrangement, alcohol use, tobacco use, living with a smoker, age, which are associated with marijuana use and to what degree are they associated with marijuana use among Ontario undergraduates? To answer the second research question, descriptive analyses were conducted to fully describe the prevalence of marijuana use based on gender, living arrangement, alcohol use, tobacco use, living with a tobacco smoker, and age. Bivariate associations were completed using chi-squared tests and a student t-test for age.
3. Of the following policy-related variables - strength of campus tobacco control policy, duration of campus tobacco control policy, student exposure to campus tobacco control policy, strength of home town by-laws where the student attended high school, duration of home town by-laws where the student attended high school, student exposure to home town by-laws where the student attended high school, strength of university town by-laws where the student attends university, duration of university town by-laws where the student attends university, student exposure to university town by-laws where the student attends university, which are associated with marijuana use and to what degree are they associated with marijuana use among Ontario undergraduates?

The third research question addressing the independent influences of the nine study variables (listed above) on students’ marijuana use was evaluated using chi-square analyses.

4. While controlling for correlates of marijuana use (gender, tobacco use, alcohol use, living arrangement, living with a tobacco smoker, and age), to what degree is each characteristic (strength of; duration of, exposure to) of home town, university town and campus tobacco control policies associated with students’ marijuana use?

5. While controlling for correlates of marijuana use (gender, tobacco use, alcohol use, living arrangement, living with a tobacco smoker, and age), what are the unique associations of the policy variables identified above on students’ marijuana use?
6. While controlling for correlates of marijuana use (gender, tobacco use, alcohol use, living arrangement, living with a tobacco smoker, and age), are there any significant interactions between policy variables identified above (i.e., campus policy strength and university town policy strength) and students’ marijuana use?

A series of logistic regressions were performed to determine the associations of the nine policy variables (home town by-law strength, home town by-law duration, students’ exposure to the home town by-law, university town by-law strength, university town by-law duration, students’ exposure to the university town by-law, and campus policy strength, campus policy duration, and students’ exposure to the campus policy) with students’ marijuana use (marijuana use was coded as ‘1’ and no marijuana use was coded as ‘0’). Logistic regression was used to determine the association of a dependent variable that is dichotomous in nature with independent variables of any type (discrete or continuous). The assumptions of logistic regression are considered to be less stringent compared to other regression techniques. The association between the dependent and independent variables in a logistic regression is expressed through the odds ratio (OR).

Figures 2 through 4 show the regression models created to answer the research questions, the first model (Model 1) was performed to determine the association of the various demographic characteristics (gender, tobacco use, alcohol use, living with a tobacco smoker, living arrangement and age) with students’ marijuana use (see Figure 2). Three additional models (see Models 2 through 4) were then built to determine the association between the students’ marijuana use and the
Figure 2

Logistic Regression Modeling for the Association of Demographic Characteristics and Marijuana Use Among Undergraduate Students in Ontario (2006).

<table>
<thead>
<tr>
<th>Marijuana use vs. Non-marijuana use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Tobacco use</td>
</tr>
<tr>
<td>Alcohol use</td>
</tr>
<tr>
<td>Living arrangement</td>
</tr>
<tr>
<td>Living with a tobacco smoker</td>
</tr>
</tbody>
</table>
home town smoking by-laws (Model 2), university town by-laws (Model 3), and campus smoking policies (Model 4). See Figure 3 below.

For the final model (Model 5), all nine policy variables were entered into the model, adjusting for demographic variables. Model 6 examines the interaction effect, following adjustment for the demographic variables, between marijuana use and the strength, duration, and exposure to the various home town, university town, and campus tobacco control policies (see Figure 4).

In this study, the odds ratio derived from logistic regression was used to evaluate the strength of risk association of marijuana use and the study variables. Assumptions for logistic regressions were also assessed and unless stated otherwise, all assumptions for logistic regression analysis were met for all models. The reference group for all models was the "non-marijuana use" group. The reference group for home town by-law and campus tobacco control policy strength was "weak" and for university town by-law strength “moderate” was the reference group. For living arrangement analysis, the reference group was "on campus". For yes/no categories, the "no" category was the reference group. For gender, “female” was the reference group.

4.6 Description of Sample

A total pool of 144,422 undergraduate students from Ontario universities was eligible to participate in the TURSOPS survey. Of those, 7,585 participated, resulting in 6,866 (90.5%) responses that were free of systematic errors\(^1\). From this sample, 1,269 responses were excluded from the analysis; 780 were outside the appropriate age

\(^1\) See methodology section 4.2.3 for information on sampling method employed.
**Figure 3**

**Logistic Regression Modeling for the Association of Demographic Characteristics with Policy Variables and Marijuana Use Among Undergraduate Students in Ontario (2006).**

<table>
<thead>
<tr>
<th>Marijuana use vs. Non-marijuana use</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living Arrangements</td>
<td></td>
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<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living with a tobacco user</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hometown by-law</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campus policy duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campus policy exposure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Figure 4**

**Logistic Regression Modeling for the Association of Demographic Characteristics with Interaction Term Policy Variables and Marijuana Use Among Undergraduate Students in Ontario (2006).**

<table>
<thead>
<tr>
<th>Marijuana use vs. Non-marijuana use</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living Arrangements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living with a tobacco user</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hometown by-law</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campus policy duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campus policy exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campus, university and hometown interaction terms</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>
range (17 to 24), 489 did not attend high school in Ontario. This resulted in a final sample of 5,613 Ontario undergraduate students.

4.7 Results of Data Cleaning and Screening

From the final sample of 5,613 students, 647 students did not complete the marijuana use question. The characteristics of these students were compared with students who did complete the marijuana use question to see if they differed significantly from each other. The sample of students who completed the marijuana use question were termed ‘included participants’ and the group of students who did not complete the marijuana use question were termed ‘excluded participants’.

The chi-squared analysis revealed that sex, age, tobacco use, alcohol use, living arrangement, and living with a tobacco smoker were similar among the respondents in the included and excluded participants (Table 1). Among policy measures, both groups were similar in strength, exposure to and duration of hometown by-laws. Similarly, strength of university town by-laws was similar among both groups. Among the included participant group, the duration of and exposure to university town tobacco policies were greater compared to the excluded participant group. Among both groups, duration of a campus tobacco control policy measures were similar. Campus tobacco control policy strength did differ with more students attending a campus with a moderately strong control policy in the excluded participant group compared to the included participant group.

The two groups do differ on a couple of tobacco policy measures and this will be taken into consideration in discussing the results of the study. The excluded participant group (n=647), were removed from any further analyses.
Table 1

Comparison of Data from Participants Included and Excluded from Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Excluded participants</th>
<th>Included participants</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( N )</td>
<td>( % )</td>
<td>( N )</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>165</td>
<td>25.8</td>
<td>1,363</td>
</tr>
<tr>
<td>Female</td>
<td>475</td>
<td>74.2</td>
<td>3,578</td>
</tr>
<tr>
<td>Tobacco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>108</td>
<td>22.6</td>
<td>1,063</td>
</tr>
<tr>
<td>No</td>
<td>369</td>
<td>77.4</td>
<td>3,835</td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16</td>
<td>88.9</td>
<td>4,058</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
<td>11.1</td>
<td>868</td>
</tr>
<tr>
<td>Living with a smoker</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>175</td>
<td>28.6</td>
<td>1,285</td>
</tr>
<tr>
<td>No</td>
<td>438</td>
<td>71.4</td>
<td>3,547</td>
</tr>
<tr>
<td>Living arrangement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>163</td>
<td>25.2</td>
<td>1,069</td>
</tr>
<tr>
<td>Family home</td>
<td>180</td>
<td>27.8</td>
<td>1,206</td>
</tr>
<tr>
<td>Off campus</td>
<td>304</td>
<td>45.0</td>
<td>2,691</td>
</tr>
<tr>
<td>Home town policy strength</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>23</td>
<td>3.6</td>
<td>168</td>
</tr>
<tr>
<td>Moderate</td>
<td>397</td>
<td>61.4</td>
<td>3,090</td>
</tr>
<tr>
<td>Strong</td>
<td>227</td>
<td>35.1</td>
<td>1,708</td>
</tr>
<tr>
<td>University town policy strength</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>261</td>
<td>41.1</td>
<td>1,757</td>
</tr>
<tr>
<td>Strong</td>
<td>374</td>
<td>58.9</td>
<td>3,200</td>
</tr>
<tr>
<td>Variables</td>
<td>Excluded participants</td>
<td>Included participants</td>
<td>$\chi^2$</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------------------</td>
<td>-----------------------</td>
<td>---------</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Campus policy strength</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>132</td>
<td>20.5</td>
<td>652</td>
</tr>
<tr>
<td>Moderate</td>
<td>261</td>
<td>40.5</td>
<td>2,767</td>
</tr>
<tr>
<td>Strong</td>
<td>251</td>
<td>39.0</td>
<td>1,544</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M (SD)</td>
<td>4,966</td>
<td>20.2 (1.6)</td>
<td>4,913</td>
</tr>
<tr>
<td>Age (years)</td>
<td>647</td>
<td>20.1 (1.7)</td>
<td>4,957</td>
</tr>
<tr>
<td>Home town policy duration (months)</td>
<td>642</td>
<td>40.3 (25.6)</td>
<td>635</td>
</tr>
<tr>
<td>University town policy duration (months)</td>
<td>627</td>
<td>79.3 (59.5)</td>
<td>4,957</td>
</tr>
<tr>
<td>Campus policy duration (months)</td>
<td>627</td>
<td>24.2 (26.4)</td>
<td>4,867</td>
</tr>
<tr>
<td>Home town policy exposure (months)</td>
<td>627</td>
<td>18.8 (12.5)</td>
<td>4,911</td>
</tr>
<tr>
<td>University town policy exposure (months)</td>
<td>621</td>
<td>17.9 (13.1)</td>
<td>4,911</td>
</tr>
</tbody>
</table>

Note: all statistical tests are two tailed, $t$-test was conducted for continuous measures; all others are chi-square tests.  
** p < .001 *** p < .0001.
CHAPTER 5: RESULTS

5.3 Sample Characteristics

The demographic characteristics (frequencies and percentages for the unweighted and weighted data) of the 4,966 undergraduates that comprised the "included participant" sample used in the subsequent analyses are presented in Table 2.

5.4 Marijuana Use and Concurrent Use of Marijuana and Tobacco

As shown in Table 2, of those who were included in the final sample, the weighted prevalence of both marijuana and tobacco use was 15.8%; the weighted prevalence of marijuana use in this sample was 30.6%.

5.5 Demographic Characteristics of Marijuana Users and Never Users

Demographic characteristics of the marijuana non-users and marijuana users were compared (Table 3). Marijuana use was significantly associated with being male, tobacco use, alcohol use, living with a smoker, and living off campus without parents. Age, however, did not differ between the non-marijuana users and marijuana users.

5.6 Policy Variables of Students’ Marijuana Use

Table 4 shows the relationships between students’ marijuana use and campus policy strength, the strength of the by-laws in the university town, and home town by-laws strength. Campus policy strength was found be significantly associated with marijuana use. A campus with a strong campus policy had a lower prevalence of marijuana use compared to a campus with a weak policy. Strength of a university
Table 2

Demographic Characteristics of the Final Sample of Young Adult Ontario Undergraduates Students (N=4,966).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unweighted</th>
<th></th>
<th>Weighted</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1,363</td>
<td>27.6</td>
<td>74,471</td>
<td>40.7</td>
</tr>
<tr>
<td>Female</td>
<td>3,578</td>
<td>72.4</td>
<td>108,697</td>
<td>59.3</td>
</tr>
<tr>
<td>Marijuana use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>3,700</td>
<td>74.5</td>
<td>127,222</td>
<td>69.5</td>
</tr>
<tr>
<td>Yes</td>
<td>1,266</td>
<td>25.5</td>
<td>55,947</td>
<td>30.6</td>
</tr>
<tr>
<td>Tobacco use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>3,835</td>
<td>78.3</td>
<td>126,024</td>
<td>70.3</td>
</tr>
<tr>
<td>Yes</td>
<td>1,063</td>
<td>21.7</td>
<td>53,356</td>
<td>29.7</td>
</tr>
<tr>
<td>Concurrent use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>4,373</td>
<td>88.1</td>
<td>154,241</td>
<td>84.2</td>
</tr>
<tr>
<td>Yes</td>
<td>593</td>
<td>11.9</td>
<td>28,927</td>
<td>15.8</td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>908</td>
<td>18.3</td>
<td>31,224</td>
<td>17.0</td>
</tr>
<tr>
<td>Yes</td>
<td>4,058</td>
<td>81.7</td>
<td>151,944</td>
<td>82.9</td>
</tr>
<tr>
<td>Living with a smoker</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>3,711</td>
<td>74.7</td>
<td>133,053</td>
<td>72.6</td>
</tr>
<tr>
<td>Yes</td>
<td>1,255</td>
<td>25.3</td>
<td>50,115</td>
<td>27.4</td>
</tr>
<tr>
<td>Living arrangement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>1,069</td>
<td>21.5</td>
<td>30,807</td>
<td>16.8</td>
</tr>
<tr>
<td>Family home</td>
<td>1,206</td>
<td>24.3</td>
<td>84,727</td>
<td>46.3</td>
</tr>
<tr>
<td>Off campus</td>
<td>2,691</td>
<td>54.2</td>
<td>67,634</td>
<td>36.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M (SD)</th>
<th>M (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>4,966</td>
</tr>
<tr>
<td></td>
<td>183,168</td>
</tr>
<tr>
<td>Variables</td>
<td>Unweighted Marijuana use</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Males</td>
<td>1,363</td>
</tr>
<tr>
<td>Females</td>
<td>3,578</td>
</tr>
<tr>
<td>Tobacco use</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1,063</td>
</tr>
<tr>
<td>No</td>
<td>3,835</td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4,058</td>
</tr>
<tr>
<td>No</td>
<td>908</td>
</tr>
<tr>
<td>Living with a tobacco smoker</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1,295</td>
</tr>
<tr>
<td>No</td>
<td>3,711</td>
</tr>
<tr>
<td>Living arrangement</td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>1,069</td>
</tr>
<tr>
<td>Family home</td>
<td>1,206</td>
</tr>
<tr>
<td>Off campus</td>
<td>2,691</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M (SD)</th>
<th>M (SE)</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>4,966</td>
<td>20.3 (1.6)</td>
</tr>
</tbody>
</table>

** p<.001. *** p<.0001.
Table 4

Comparison of Strengths of Policy Measures of Marijuana Users among a Sample of Young Adult Ontario Undergraduates (N=4,966)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unweighted Marijuana use</th>
<th>N</th>
<th>%</th>
<th>Weighted Marijuana use</th>
<th>N</th>
<th>%</th>
<th>χ²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>652</td>
<td>35.3</td>
<td></td>
<td>101,313</td>
<td>34.2</td>
<td></td>
<td>46.5***</td>
</tr>
<tr>
<td>Moderate</td>
<td>2,767</td>
<td>22.6</td>
<td></td>
<td>49,343</td>
<td>24.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>1,544</td>
<td>26.6</td>
<td></td>
<td>32,462</td>
<td>28.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University town</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>1,757</td>
<td>28.9</td>
<td></td>
<td>127,491</td>
<td>32.7</td>
<td></td>
<td>8.4</td>
</tr>
<tr>
<td>Strong</td>
<td>3,200</td>
<td>23.6</td>
<td></td>
<td>54,969</td>
<td>25.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home town</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>168</td>
<td>17.9</td>
<td></td>
<td>4,160</td>
<td>22.7</td>
<td></td>
<td>5.6</td>
</tr>
<tr>
<td>Moderate</td>
<td>3,090</td>
<td>26.0</td>
<td></td>
<td>139,486</td>
<td>30.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>1,708</td>
<td>25.4</td>
<td></td>
<td>39,523</td>
<td>32.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** p<.001. *** p< .0001.
town by-law and the strength of a home town by-law were not found to be associated with marijuana use.

Table 5 shows the relationship between the students’ marijuana use and campus policy duration (in months), the duration (in months) of the by-laws in the university town, and home town by-law duration (in months). The duration of a campus policy, university town and home town by-law was not found to be associated with marijuana use.

Table 6 shows the relationship between student’s marijuana use and the exposure (in months) to campus tobacco control policies, the exposure (in months) to the tobacco by-laws in the university town, and the exposure (in months) to the by-laws in the home town. Student’s exposure to a campus policy, university town and home by-law were not found to be significantly associated with marijuana use.

5.7 Relationships between Demographic and Policy Characteristics and Marijuana Use

A series of logistic regressions was performed to determine the associations of the nine policy variables (home town by-law strength, home town by-law duration, students’ exposure to the home town by-law, university town by-law strength, university town by-law duration, students’ exposure to the university town by-law, and campus policy strength, campus policy duration, and students’ exposure to the campus policy) with students’ marijuana use. Unless stated otherwise, all assumptions for logistic regression analysis were met for all models. The covariate of interest was marijuana use, defined as ‘1’ in all models. The reference group for all strengths of policy analysis was "weak", and for living arrangement analysis, the reference group
Table 5

Comparison of Tobacco Control Policy Duration Measures (months) of Marijuana Users among a Sample of Young Adult Ontario Undergraduates (N=4,966)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Weighted Marijuana use</th>
<th>Unweighted Marijuana use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M(SE)</td>
<td>N</td>
</tr>
<tr>
<td>Campus</td>
<td>1072 (12.8)</td>
<td>183,169</td>
</tr>
<tr>
<td>University town</td>
<td>58.1 (6.1)</td>
<td>183,169</td>
</tr>
<tr>
<td>Home town</td>
<td>43.4 (1.2)</td>
<td>183,169</td>
</tr>
</tbody>
</table>

* p<.05, ** p<.01, *** p<.001
Table 6

Comparison of Tobacco Control Policy Exposure Measures (months) of Marijuana Users among a Sample of Young Adult Ontario Undergraduates (N=4,966)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unweighted Marijuana use</th>
<th>Weighted Marijuana use</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M(SD)</td>
<td>N</td>
</tr>
<tr>
<td>Campus</td>
<td>4,911</td>
<td>20.4 (12.9)</td>
<td>183,169</td>
</tr>
<tr>
<td>University town</td>
<td>4,911</td>
<td>20.9 (11.6)</td>
<td>183,169</td>
</tr>
<tr>
<td>Home town</td>
<td>4,867</td>
<td>24.6 (28.0)</td>
<td>183,169</td>
</tr>
</tbody>
</table>

** p<.001. *** p<.0001.
was "on campus". For yes/no categories, the "no" category was the reference group. For gender, "female" was the reference group.

Models 1 through 5 were used to build Model 6, which included all measures. The results of these analyses are presented in Tables 7 through 11 with information provided on the odds ratios and the 95% confidence intervals. In Table 7, the demographic characteristics (i.e., gender, living arrangement, alcohol use, tobacco use, living with a tobacco smoker and age) were entered to determine their influence on marijuana use among students. In Table 8, home town by-law variables (strength, duration, and students' exposure) were entered to determine their influence on marijuana use among students. In Table 9, university town by-law variables (strength, duration, and students' exposure) were entered to determine their influence on marijuana use among students. In Table 10, campus tobacco control policies (strength, duration and students' exposure) were entered to determine their influence on marijuana use among students. In Table 11, all nine policy variables were included, as well as the demographic characteristics that determine Ontario undergraduate students marijuana use. Finally, of the possible interaction terms that may arise from this analysis, only the significant terms (university town policy strength and university town policy exposure in Model 3; campus policy strength in Model 4) were combined in order to examine the differential effects between home town by-laws, university town by-laws, and campus smoking policies; significant interaction terms where entered into Model 6 along with all variables from the full model (tables not shown here).
5.7.1 Demographic Characteristics

As shown in Table 7, Model 1 revealed a number of significant associations between the demographic characteristics of the students and marijuana use. The odds ratio of being a marijuana user was higher for males, students who consume tobacco, students who consume alcohol and students who live with a tobacco smoker. Living in a family home significantly decreased the odds of student marijuana use compared to students living on campus. Living off campus was not significantly associated with marijuana use, and the odds of being a marijuana user was not associated with age.

5.7.2 Home Town Smoking By-Law and Marijuana Use

Table 8 presents the odds of marijuana use for home town by-law strength, home town by-law duration, and the students’ exposure to home town by-law after adjustment for demographic characteristics.

Individually, none of the following factors - home town policy strength, duration of home town policy, or students’ exposure to the home town by-laws, were significantly associated with marijuana use, following adjustment for demographic characteristics (gender, tobacco use, alcohol use, living with a smoker, living arrangement and age). However, the results of Model 2 suggest that when all home town policy variables were introduced into the model (as well as demographics characteristics), for every one month increase in the exposure of students to home town by-law policy, there was a 1.01 increase in the odds of being a marijuana user (95% CI 1.01-1.02). In contrast, for every one month increase in the duration of a home town by-law policy, there was 0.99 decrease in the odds of being a marijuana user (95% CI 0.98-0.99).
Table 7

The Odds Ratios (95% CI) of Marijuana Use for the Selected Demographic Characteristics among Young Adult Ontario Undergraduates (N=4,966).

<table>
<thead>
<tr>
<th>Marijuana users vs. Non-marijuana users</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.23</td>
<td>1.06-1.44</td>
</tr>
<tr>
<td>Tobacco use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3.16</td>
<td>2.70-3.70</td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.29</td>
<td>2.05-2.56</td>
</tr>
<tr>
<td>Living with a smoker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.85</td>
<td>1.57-2.17</td>
</tr>
<tr>
<td>Living arrangement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Family home</td>
<td>0.76</td>
<td>0.61-0.95</td>
</tr>
<tr>
<td>Off campus</td>
<td>1.13</td>
<td>0.90-1.41</td>
</tr>
<tr>
<td>Age</td>
<td>0.98</td>
<td>0.94-1.03</td>
</tr>
</tbody>
</table>
Table 8

The Odds Ratios (95% CI) of Marijuana Use for Home Town By-law Variables Adjusted for Demographic Characteristics among Young Adult Ontario Undergraduates (N=4,966).

<table>
<thead>
<tr>
<th>Marijuana users vs. Non-marijuana users</th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td></td>
</tr>
<tr>
<td><strong>Home town policy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>0.94</td>
<td>0.51-1.74</td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>1.10</td>
<td>0.58-2.06</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>0.99</td>
<td>0.98-1.00</td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>1.01</td>
<td>1.00-1.02</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.24</td>
<td>1.06-1.44</td>
<td></td>
</tr>
<tr>
<td><strong>Tobacco use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3.20</td>
<td>2.72-3.76</td>
<td></td>
</tr>
<tr>
<td><strong>Alcohol use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.25</td>
<td>2.02-2.52</td>
<td></td>
</tr>
<tr>
<td><strong>Living with a smoker</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.79</td>
<td>1.52-2.11</td>
<td></td>
</tr>
<tr>
<td><strong>Living arrangement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family home</td>
<td>0.85</td>
<td>0.68-1.07</td>
<td></td>
</tr>
<tr>
<td>Off campus</td>
<td>1.22</td>
<td>0.97-1.54</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>1.04</td>
<td>0.98-1.09</td>
<td></td>
</tr>
</tbody>
</table>
The contribution of the demographic characteristics in Model 2 were the same as seen in Model 1, i.e., there was an increased odds ratio for marijuana use among students who were male, used tobacco, used alcohol, lived with a tobacco smoker, and lived off campus. However, unique to this model was the factor "living in a family" which was less "protective" for marijuana use after adjusting for home town policy measures (see Model 1). Similar to the findings of Model 1, age was not significantly associated with marijuana use within any of the models that examined home town policy measures.

5.7.3 University Town Smoking By-Law and Marijuana Use

Table 9 presents Model 3, which examined collectively, the effect of all three measures of university town policy, while controlling for demographic characteristics.

Model 3 suggests, following adjustment for demographic characteristics (gender, tobacco use, alcohol use, living with a smoker, living arrangement and age), students living in a university town with a strong tobacco were at decreased odds (OR=0.61, 95% CI 0.50-0.74) of being a marijuana user (Table 9). Model 3 also shows that for every one month increase in the exposure of students to university town policy, there was a reduction in the odds of being a marijuana user (OR =0.99, 95% CI 0.98-0.99). The duration of a university town tobacco control policy was not found to be related to the odds of marijuana use.

When all policy variables were introduced into the university town model (Table 9), the length of exposure and the strength of the university town policy continue to be related to the odds of marijuana use. Similar to the models that
Table 9

The Odds Ratios (95% CI) of Marijuana Use for University Town By-law Variables Adjusted for Demographic Characteristics among Young Adult Ontario Undergraduates (N= 4,966).

<table>
<thead>
<tr>
<th>Marijuana users vs. Non-marijuana users</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
</tr>
<tr>
<td>University town policy</td>
<td></td>
</tr>
<tr>
<td>Strength:</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>1.00</td>
</tr>
<tr>
<td>Strong</td>
<td>0.61</td>
</tr>
<tr>
<td>Duration</td>
<td>1.00</td>
</tr>
<tr>
<td>Exposure</td>
<td>0.99</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.00</td>
</tr>
<tr>
<td>Male</td>
<td>1.33</td>
</tr>
<tr>
<td>Tobacco use</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>Yes</td>
<td>3.05</td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>Yes</td>
<td>2.28</td>
</tr>
<tr>
<td>Living with a smoker</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
</tr>
<tr>
<td>Yes</td>
<td>1.87</td>
</tr>
<tr>
<td>Living arrangement</td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>1.00</td>
</tr>
<tr>
<td>Family home</td>
<td>0.75</td>
</tr>
<tr>
<td>Off campus</td>
<td>1.40</td>
</tr>
<tr>
<td>Age</td>
<td>1.03</td>
</tr>
</tbody>
</table>
examined home town policy measures, the demographic characteristics of gender, tobacco use, alcohol use, and living with a tobacco smoker, were significantly related to the odds of marijuana use. Interestingly, when all university town policy measures were introduced, living off campus was found to increase (OR=1.40) the odds of marijuana use among students (95% CI 1.10-1.78). This is in contrast to the findings presented in Tables 7 and 8 in which living off campus was not related to the odds of marijuana use. In the university town models, "living with family" significantly decreased the odds of marijuana use (0.75, 95% CI 0.60-0.95).

5.7.4 Campus Tobacco Control Policy and Marijuana Use

Table 10 presents Model 4, which examined the effects of the strength, the duration, and the exposure of campus tobacco control policy on marijuana use, while controlling for demographic characteristics.

Model 4 reveals that a moderately strong campus smoking policy was significantly related to a decreased odds of marijuana use (OR=0.51, 95% CI 0.41-0.63 respectively), after adjusting for demographic characteristics (gender, tobacco use, alcohol use, living with a smoker, living arrangement and age). In contrast, when further controlling for duration and exposure length, the odds of marijuana use among students attending a campus with a strong tobacco control policy was no longer significant.

Following adjustment for all campus smoking policy measures, it was found that for every one month increase in the exposure of students to campus smoking policy, there was a reduction in the odds of being a marijuana user (OR=0.99, 95%
Table 10

The Odds Ratios (95% CI) of Marijuana Use for the Campus Tobacco Control Policy Variables Adjusted for Demographic Characteristics among Young Adult Ontario Undergraduates (N= 4,966).

<table>
<thead>
<tr>
<th>Marijuana users vs. Non-marijuana users</th>
<th>Model 4</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campus Policy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strength:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>0.51</td>
<td>0.41-0.63</td>
</tr>
<tr>
<td>Strong</td>
<td>0.83</td>
<td>0.61-1.14</td>
</tr>
<tr>
<td>Duration</td>
<td>1.00</td>
<td>1.00-1.00</td>
</tr>
<tr>
<td>Exposure</td>
<td>0.99</td>
<td>0.98-1.00</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.36</td>
<td>1.17-1.59</td>
</tr>
<tr>
<td>Tobacco use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.99</td>
<td>2.54-3.51</td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.26</td>
<td>2.02-2.54</td>
</tr>
<tr>
<td>Living with a smoker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.89</td>
<td>1.60-2.23</td>
</tr>
<tr>
<td>Living arrangement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Family home</td>
<td>0.68</td>
<td>0.54-0.86</td>
</tr>
<tr>
<td>Off campus</td>
<td>1.46</td>
<td>1.15-1.86</td>
</tr>
<tr>
<td>Age</td>
<td>1.03</td>
<td>0.97-1.09</td>
</tr>
</tbody>
</table>
CI 0.98-0.99). Similar to the university town models, the duration of a campus smoking policy was not significantly associated with marijuana use. Consistent with the university town models, when all campus smoking policy measures were included in the model, living off campus was found to be significantly associated with marijuana use (OR=1.46, 95% CI 1.15-1.86). This result is not consistent with the home town policy model presented in Table 8 where living in a family home or off campus was not related to the odds of marijuana use. All other demographic characteristics remained consistent in their association with marijuana use as shown in past models.

5.7.5 Final Model and Interaction Effect Model

Table 11 presents the final model (Model 5) in which all nine of the policy variables (home town by-law duration, home town by-law exposure, home town by-law strength, university town by-law duration, university town by-law exposure, university town by-law strength, campus policy duration, campus policy exposure, and campus policy strength) were examined while controlling for demographic characteristics (gender, tobacco use, alcohol use, living with a smoker, living arrangement and age).

A comparison of Model 2 (home town by-laws, Table 8) to the final model reveals that the exposure to a home town by-law was no longer related to the odds of marijuana use. In comparing Model 3 (university town by-laws, Table 9) to the final model, it can be seen that the strength of, and the exposure to, a university town by-law were no longer related to the odds of marijuana use. Finally, a comparison of Model 4 (campus policy, Table 10) to the final model indicates that a strong campus
Table 11

The Odds Ratios (95% CI) of Marijuana Use for the Summative Tobacco Control Policy Variables Adjusted for Demographic Characteristics among Young Adult Ontario Undergraduates (N= 4,966).

<table>
<thead>
<tr>
<th>Marijuana users vs. Non-marijuana users</th>
<th>Model 5</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td></td>
</tr>
<tr>
<td><strong>Home town strength:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>1.00</td>
<td>0.49-1.73</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>0.92</td>
<td>0.67-2.44</td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>1.28</td>
<td>0.98-1.02</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>1.00</td>
<td>0.98-1.02</td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>1.00</td>
<td>0.97-1.03</td>
<td></td>
</tr>
<tr>
<td><strong>University town strength:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>1.00</td>
<td>0.65-1.37</td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>0.94</td>
<td>0.99-1.00</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>1.00</td>
<td>0.97-1.03</td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>1.00</td>
<td>0.99-1.01</td>
<td></td>
</tr>
<tr>
<td><strong>Campus policy strength:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>1.00</td>
<td>0.36-0.76</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>0.52</td>
<td>0.53-1.17</td>
<td></td>
</tr>
<tr>
<td>Strong</td>
<td>0.79</td>
<td>1.00-1.00</td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>1.00</td>
<td>0.96-1.01</td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>0.99</td>
<td>1.17-1.61</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.00</td>
<td>2.59-3.59</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.37</td>
<td>2.01-2.52</td>
<td></td>
</tr>
<tr>
<td><strong>Tobacco use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>1.60-2.23</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3.05</td>
<td>0.56-0.91</td>
<td></td>
</tr>
<tr>
<td><strong>Alcohol use</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>1.15-1.87</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.25</td>
<td>0.97-1.10</td>
<td></td>
</tr>
<tr>
<td><strong>Living with a smoker</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1.00</td>
<td>2.01-2.52</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.89</td>
<td>1.60-2.23</td>
<td></td>
</tr>
<tr>
<td><strong>Living arrangement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On campus</td>
<td>1.00</td>
<td>0.56-0.91</td>
<td></td>
</tr>
<tr>
<td>Family home</td>
<td>0.71</td>
<td>1.15-1.87</td>
<td></td>
</tr>
<tr>
<td>Off campus</td>
<td>1.46</td>
<td>0.97-1.10</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>1.03</td>
<td>0.97-1.10</td>
<td></td>
</tr>
</tbody>
</table>
policy and exposure to a campus policy are no longer related to the odds of marijuana use. However, following adjustment for all the policy variables, a moderately strong campus policy remains significantly related to a decrease in the odds of marijuana use (OR=0.52, 95% CI 0.36-0.76). Similar to all other models, gender, tobacco use, alcohol use, living with a tobacco smoker, and living in a family home (but not age) were significantly related to the odds of marijuana use.

Similar to Models 8 and 9 on the influence of university town by-laws (Table 9), and Models 10, 12, and 13 on the effect of campus policies (Table 10), living off campus was found to significantly increase the odds of marijuana use. In order to investigate for differential effects between home town by-laws, university town by-laws, and campus smoking policies, 2 interaction terms were created from the significant policies measures campus strength, university town strength and university town exposure. The two interaction terms were entered into Model 6 along with all variables from the full model (Model 5). Neither of the interaction terms were found to be significant. (Tables not shown here).
CHAPTER 6: DISCUSSION

6.1 Correlates of Marijuana Use

Marijuana use and tobacco use were found to be highly correlated in the present study, which is consistent with previous research (Amos et al., 2004; Grunbaum et al., 2004; Leatherdale et al., 2006; Patton et al., 2005). Of all the correlates examined in this study, tobacco use has been most strongly linked to marijuana use. This result is expected as marijuana and tobacco users share similar sociodemographic characteristics (Amos et al., 2004; Leatherdale et al., 2006; Patton et al., 2005).

Through qualitative research, Amos and colleagues (2004) found marijuana was linked to tobacco smoking by young adult marijuana users either starting to smoke cigarettes, continuing to smoke cigarettes and actual and anticipated problems in quitting smoking cigarettes. In a cross sectional study design involving a Canadian national sample, Leatherdale and colleagues (2006) found current smokers had a substantially higher rate of marijuana use compared to non-tobacco smokers and this was consistent across all ages. A longitudinal study conducted by Patton and colleagues (2005) found weekly or more marijuana use during young adulthood was associated with increased risk of late initiation of tobacco use and progression to nicotine dependence. Literature clearly states among qualitative, cross-sectional and longitudinal research marijuana and tobacco are highly correlated. This study adds to the current body of research by suggesting a relationship between marijuana and tobacco among Ontario young adult undergraduates. To date this is the first study to reveal this expected concurrent relationship among this sample.
In the present study, students who use marijuana also tend to be male, consume alcohol, live away from home (versus with parents) and, live with tobacco smokers. These findings are consistent with previous literature showing marijuana use was significantly related to being male (Leatherdale et al, 2007; Swift et al, 2008; Bell et al, 1997), alcohol use (Bell et al, 1997; Hammersley & Leon, 2005) and living off campus without parents (Adlaf et al, 2003b).

Despite the fairly robust association between gender and marijuana use in the general population, there is much less evidence of a gender difference in the post-secondary student sample. For instance, Adlaf et al (2003b) found a weak relationship, Bates, Accordin and Hewes (2010) found no relationship and this study found a strong relationship between marijuana and gender. This difference could be attributed to neither Adlaf et al (2003b) nor Bates et al (2010) employing a weighting system to address the gender distribution difference found in their student samples. In the general population males and females are approximately equal. Among the student samples used by both Adlaf et al (2003b) and Bates, Accordin and Hewes (2010) females far outnumber males. Their lack of findings for gender and marijuana use could be the result of how many females and males were used in their analysis. As discussed in the methodology section, a weighting system was developed for the TURSOPS dataset specifically to address gender distribution. The weighting system was designed to allow the student sample collected to represent the gender distribution found in the general population.

In the present study, alcohol use was significantly related to marijuana use. Among international studies, the relationship between alcohol use and marijuana use is considered strong (Bell et al., 1997; Hammersley & Leon, 2005). Similar to this
study, Bell and colleagues (1997) used a large representative sample of students to assess student characteristics (including alcohol use) and marijuana use. They also examined this relationship through univariate and multivariate analysis (Bell et al, 1997). Interestingly, Bell and colleagues (1997) examined proximity to alcohol outlets and marijuana use. Univariate analysis found students near an alcohol outlet or on a campus with a pub were more likely to use marijuana. However, when included in multivariate analysis, proximity to alcohol outlets no longer was significantly related to marijuana use (Bell et al, 1997). Hammersley and colleagues (2005) conducted an exploratory study using a snow-ball sampling design where they found alcohol and marijuana to be related. They acknowledge the limitation in their study design but indicate future findings are unlikely to be fundamentally different. Also, one recommendation made included the need for theoretical models to better inform regression analysis (Hammersley et al, 2005). This study undertaken here employs theoretical modeling to inform regression analysis, further strengthening literature examining alcohol use and marijuana use.

In this study, consistent throughout all Models, students who live off campus without parents were at significantly increased odds of marijuana use compared to their counterparts living with parents. Based on Canadian undergraduate research this is expected (Adlaf et al, 2003b). Some similarities and differences do exist between this study and the study conducted by Adlaf and colleagues (2003b). A similarity is both studies employed a stratified sample design in order to create a representative sample (Canada and Ontario). This also highlights one difference being this study uses a representative sample of Ontario undergraduates while Adlaf et al (2003) uses a representative sample of Canadian undergraduates. The consistency between both a
provincial and national Canadian study finding a significant relationship between living arrangement and marijuana use further strengthens the current Canadian literature on living arrangement and marijuana use.

The association between marijuana use and living with a tobacco smoker has not been investigated in the literature. In the present study, living with a tobacco smoker was found to be a strong correlate of marijuana use among Ontario undergraduates. Students living with a tobacco smoker were at increased odds of marijuana use compared to students not living with a tobacco smoker. Although unique, this finding is to be expected given the strong concurrent relationship between tobacco use and marijuana use. Additionally, many research studies suggest licit and illicit drug use in the college or university setting is social in nature (Bell et al, 1997; Hammersley et al, 2005; Amos et al, 2004; Adlaf et al, 2003b).

Age as a correlate of marijuana use is presented with conflicting results in the literature. While U.S. studies indicate age is a correlate of marijuana (Bell et al., 1997; Brook et al., 1999), Canadian studies, including this one, have not found any relationship between age and marijuana use (Adlaf et al, 2003b; Leatherdale et al., 2007). Although Bell and colleagues (1997) conclude on its own, age was a significant correlate of marijuana use, upon inclusion of other student characteristics the relationship between age and marijuana use reverses. Specifically, univariate analysis found students younger than 24 years were at increased odds of marijuana use (OR=1.55, 95% CI 1.40-1.72) compared to students older than 24 years. When controlling for other student characteristics the opposite was found; a student younger than 24 years was protective for marijuana use (OR=0.85, 95% CI 0.73-0.99). Finally, upon controlling for student characteristics and college
characteristics, age was no longer significantly related to marijuana (Bell et al, 1997). The study by Bell and colleagues (1997) presents conflicting results for age as a correlate of marijuana use. In contrast, Brooks and colleagues (1999) using survival analysis, found of all the predictors of marijuana use examined, age to be the most important predictor of marijuana use from adolescence to young adulthood. Based on U.S. studies it remains unclear how age is related to marijuana use. Among Canadian literature, this study adds to the growing evidence that age does not seem to be a correlate of marijuana use.

6.2 Relationships between Tobacco Control Policies and Marijuana Use

This study shows no characteristics of hometown bylaws influence marijuana use, strength of university town bylaws may have an influence on marijuana use and strength of campus policies do have an influence on marijuana use among Ontario undergraduates. These results offer a unique insight into the unintended consequences of the implementation of health policy. Studies have examined the relationship between marijuana and various aspects of tobacco policies (Farrelly et al, 2001; Goel, 2009). They suggest changes imposed on the use of one drug are likely to affect the use of other drug. The variations in influence by policy settings (hometown, university town and campus) found in this study are likely a reflection of the characteristics of each policy and the environment they are implemented. Hometown policy characteristics (strength of, duration of, exposure to) where not found to be associated with the use of marijuana among this sample. With the results of the study indicating strength of a university town by-law and the strength of a campus policy having a significant association with marijuana use, it is likely a home
town policy characteristics are too far removed from the day to day activity of most students in sample to have a significant influence. Earlier living arrangement characteristics indicated relatively few students who completed the survey lived at home with parents compared to those of lived off campus without parents. This highlights the lack of influence a home town policy is likely to have on the built environment surrounding student life in an Ontario university.

The strength of a university town by-law may have an influence on the use of marijuana among this sample. Although similar in characteristics to a home town by-law, a university town by-law is consistent in having presence among all students sampled. Whether living at home with parents or off campus without parents, all students sample conduct their day to day activities in the presence of a university town by-law. This allows for the opportunity for the strength of a university town by-law to influence student behaviour. The consistency of this relationship is not as strong compared to the influence of a campus policy since the municipal by-law does not account for the built environment of the campus setting (i.e., smoking in campus pubs, residence).

The strength of a campus policy does have an influence on marijuana use among students surveyed in this study. All students regardless of living arrangement experience the strength of a campus tobacco control policy. Whether a student lives on campus or off campus, with or without parents, day to day activities in the built environment of a campus setting are governed by university policy including tobacco control. For instance, campus policies influence the setting where smoking is permitted (both indoor and outdoor) as well as the sale of tobacco products. An interesting finding was a moderately strong campus policy and not a strong campus
policy was found to reduce marijuana use among this sample. This variation is unexpected but likely is a result of the characteristics that differ between a moderately strong and a strong campus policy. A Strongly campus tobacco control policy restricts in a similar fashion to moderately strong campus policy with the additions of regulating outdoor smoking to designated smoking areas and banning the sale and advertising of tobacco. Although research finds these two characteristics to significantly influence the use of tobacco (Hammond, 2005; Lantz, 2003), based on the results of this study, the restricting of outdoor smoking to designated smoking areas and the ban of sales and advertising of tobacco does not influence the use of marijuana by students.

Interestingly, a moderately strong campus tobacco control policy but not a strong campus tobacco control policy was found to be significantly associated with marijuana use among this sample. Although this finding is counterintuitive, it does match findings among U.S research investigating strength of state level tobacco control policy and tobacco. Research by Tauras (2004), Chaloupka and Wechsler (1997), Chaloupka and Saffer (1992), & Chaloupka (1992) all indicate significant reductions in cigarette use when clean air policies are introduced to move from a weak or no control toward a moderate level of control, but not when moving from moderate restrictions toward strong restrictions. Stronger restrictions such as banning tobacco sales, advertisements were not found to be significantly associated with reduced tobacco. This study provides a similar finding with regard to marijuana use.
6.3 Strengths and Limitations

In the present study, there are a number of strengths and limitations worth discussing. First, a large, sample of Ontario undergraduates drawn from a provincially representative sample of institutions was used to examine how tobacco control policies are related to marijuana use. Additionally, a weighting system was applied to the data to help ensure confidence in the generalizability of the results of this study. To the degree that this sample is representative of Ontario undergraduate students, it highlights the fairly widespread use of marijuana among Ontario undergraduates. Likewise, the generalizability of the relationship between tobacco control policies and marijuana use will allow for policy makers across the province to use the findings of this study to develop their tobacco control policies knowing the relationship these controls have on marijuana use.

Second, the investigation of the relationship between marijuana use and tobacco control policies in the home towns where undergraduates grew up (home town tobacco control by-laws), in the community where they attended university (university town tobacco control by-laws), and on the campus of the university which they attended (campus tobacco control policies) is a strength of this study, as no previous study has examined the independent relationships of these tobacco control policies with marijuana use. Although it was suggested by Farrelly and colleagues (2001) that marijuana use could be reduced by tobacco control initiatives, their study only examined the impact of cigarette taxation on the prevalence of marijuana use, and did not study any individual components of tobacco control initiatives.
The present study does have a number of limitations that need acknowledged and discussed. First, data for this study were obtained through self-reported measures, and as such are subject to non-sampling errors, such as misreporting, misunderstanding of the question, or other factors that are inherent to self-reporting. Since the use of marijuana constitutes a criminal offense in Canada, it is likely that marijuana use was under reported in the present study. While all efforts were made by the researchers administrating the TURSOPS survey to convey the presence of confidentiality to student participants, this limitation is innately present.

Second, the sample used in this study did differ from the sample excluded from this study on a couple of the tobacco policy measures. Among the included participant group, the duration of exposure to a university town tobacco by-law was greater compared to the excluded participant group. Similarly, among the included participant group, the exposure to a campus tobacco policy was greater compared to the excluded participant group. Strength of a campus tobacco control policy did differ with more students attending a campus with a moderately strong control policy in the excluded participant group compared to the included participant group. Of these measures, strength of a campus tobacco control policy was found to be significantly associated with marijuana use.

Third, the level of enforcement of the tobacco control policies is not accounted for in this study. Enforcement is considered as an important component to the success of any policy; however, research to date has not produced an accurate method of measuring policy enforcement.

Fourth, the response rate was low for the sample used. A low response rate can lead to findings that are not representative; however, a stratified random selection
of institutions was used in generating this sample. Additionally, a weighting system was administered to reflect the generation population. Two studies (Owen-Smith, Burgess-Allen, Lavelle & Wilding, 2008; Dey, 1997) have found weighing procedures to be effective means at reducing non-response bias.

Fifth, the timeframe of data presented in the Municipal By-Law Report (2005) could have been out of date by the time respondents completed the TURSOPS questionnaire. In January 2006, the Ontario Smoke Free Act came into effect and may have resulted in some municipalities taking on more stringent tobacco control measures prior to the TURSOPS administration. Moreover, it is quiet feasible the municipalities coded as weak (or moderate) in the tobacco control policy dataset could have actually been either moderate or strong by the time the respondents were surveyed. This may have resulted in tobacco control policy strength categories being not reflective of the true setting experienced by respondents.

Sixth, the TURSOPS survey was administered through each institutions registrar’s office. This could have presented a conflict for potential respondents as the registrar’s office houses their personal information and can hand down punishments to students in violation of school policies and legislation. In this instance, the TURSOPS survey asks about illicit drug use (through the registrar’s office) which, if used on campus, can result in punishment to respondents.

Seventh, as detailed in the methodology section, the TURSOPS survey was administered all respondents in a one-time email. No follow-up or reminder emails were sent to potential respondents. This likely contributed to the low response rate.

Seventh, the reward presented to potential respondents for completing the TURSOPS survey was a 1 in 10 chance to win a $10 dollar Chapter’s gift card. This
likely did not present enough of an incentive for potential respondents, who, combined with the timeframe of data collection, mostly likely did not feel the reward presented was worth their time. This could have also contributed to the low response rate.

Finally, inherent to the use of a secondary data set, is the lack of control over the development of the survey questions, as well as how they are administered. A number of limitations therefore result from using this source. First, the purpose of the TURSOPS data set was to determine the prevalence of tobacco use, as well as smoking behaviours of young adult undergraduates in Ontario. As such, the examination of marijuana use was not considered during the development and implementation of the data collection. Likewise, the tobacco control policy measures were not originally obtained with the intention of examining marijuana use. For instance, the exposure to a tobacco control policy in the home town setting assumes a student attended high school in one location, which is likely not the case for all participants. Similarly, exposure to a university town tobacco control policy assumes that the student attended the same university throughout the duration of their undergraduate degree. Once again, this may not be the case as not all students complete their undergraduate work at one institution.

Second, the placement of the marijuana use question in the TURSOPS questionnaire could not be addressed. The marijuana use question was second to last in the survey. This likely contributed to the low response rate surrounding the marijuana use question.

Third, the timing of data collection was also a limitation and likely influenced the response rate found. Data collection, as outlined in the methodology section,
started in November 2005 and ended in January 2006. It is likely the end of the
school term and subsequent holiday break contributed to the low response rate as it
decreased the number of students who either viewed the email invitation or
completed the TURSOPS questionnaire.

Fourth, inherent to using a secondary data source, prior knowledge of
development, administration or collection issues experienced by the researchers in
charge of the survey could have had an influence on the decisions made on the use of
key measures used in this study. This lack of control in the development of
questions, as well as the lack of control over the administration of the survey may
introduce some random and systematic error to the measures examined in the study.

6.4 Implications for Practice
Since the results of the present study indicate that 52.1% of marijuana users also use
tobacco, that there are very strong odds of marijuana use among tobacco users, and
that there is an influence, in the campus setting, of tobacco control policy strength on
marijuana use, it seems that continued efforts in reducing tobacco use in the campus
setting through tobacco policy may result in reductions in marijuana use among
Ontario young adult undergraduates. With the present study indicating the strength of
campus tobacco control policy is related to the prevalence of marijuana use it
suggests that universities may play an important role in reducing marijuana use
among young adults through tobacco control policy.

Since current research indicates marijuana use is associated with negative
health consequences (Aldington et al., 2008; Iversen, 2005; Tashkinet al., 2002;
Tashkin et al., 1991), efforts are needed to help reduce the rise in marijuana use.
Implications for campus clinicians include asking a tobacco smoker if he/she is using marijuana when he/she indicates that he/she is trying to quit. The concurrent nature of tobacco smoking and marijuana use, and the fact that marijuana use undermines one's ability to quit (Timberlake et al., 2007) supports such an initiative.

Both living off campus and living with a smoker appear to be risk factors for marijuana use, university administrators need to address marijuana use not just for students in residence, but also for students living off campus. This is especially important given most students live off campus after their first year of university.

The finding that a moderately strong campus tobacco control policy is associated with a lower marijuana use is also of importance to university campus administrators. Efforts should be made to university settings with weak campus tobacco control policies to strengthen such policies as this has the potential to reduce marijuana use among Ontario undergraduates.

6.5 Future Research

Further examination of what aspects of tobacco policy are related to marijuana use is needed. This study found in the campus setting restrictions that included bans on indoor smoking, restricted outdoor smoking were related to marijuana, but not the restriction of outdoor smoking to designated smoking areas and banning of tobacco sales and advertising. Future policies studies could examine other aspects such as taxation and access to contraband cigarettes and their relation to marijuana use.

With the finding of a significant association between living with a tobacco smoker and marijuana use, it would be of interest to determine whether living with a marijuana user is associated with marijuana use. The concurrent nature of tobacco use and
marijuana use makes it seem likely there is an association, however, to date this has not been examined empirically.

A longitudinal study is needed examine the nature of any causality for the cross sectional findings of the present study. Although the present study has presented solid results that indicate significant relationships between some variables associated with marijuana use, the direction of these relationships cannot be determined through a cross-sectional design. As the present study was the first to examine tobacco control policies (strength of, duration of and exposure to) and their relationship with marijuana use, it represents a starting point for an in depth investigation of these relationships, preferably through the use of a longitudinal design. For instance, longitudinal research could involve examining duration of and exposure to tobacco control policies over time and the relation to marijuana use. Also, future research could examine the direction of causality of marijuana use leading to tobacco versus tobacco use leading marijuana and the relation to tobacco control policies.

Since the Ontario Smoke Free Act (OSFA) was enacted in May 2006, prohibited smoking in all enclosed public places and workplaces, it would be of interest to see how this legislation has altered (hopefully strengthened) the results found in the present study. The new legislation has eliminated the variability in tobacco control policy at the community and university levels through standard restrictions on outdoor smoking (i.e., smoking shelters) and banning smoking in campus pubs. However, on many university campuses, there is still considerable variability in tobacco control policies, such as restrictions on smoking around building entrances or smoking in campus residences.
6.6 Conclusions

The present study revealed tobacco control policies in the campus setting are related to the prevalence of marijuana use among Ontario young adult undergraduates. Students attending a campus with a moderately strong tobacco control policy were less likely to use marijuana monthly compare to students attending a campus with a weak tobacco control policy. The results of this study add further support to the growing body of literature on the unexpected side effects of targeted health policy. Researchers and policy makers can use this information to develop more effective strategies to help curb marijuana use among young adult students. Policy makers in campus settings can use the results of this study to further warrant the development of comprehensive tobacco control policies not only to reduce tobacco use but assist with the reduction of marijuana use as well. Researchers interested in issues and strategies pertaining to marijuana use and control strategies can further explore the concurrent relationship between marijuana and tobacco use and how the policies aimed at reducing one can affect another.
References


Public Policy Source. (2000). *A Frasier institute occasional paper: The history of tobacco regulation forward to the past*. Frasier Institute, British Columbia, Canada


Statutes of Canada (1996) Controlled Drugs and Substances Act (CDSA)


DATE: July 12, 2005
FROM: Linda Rose-Krasnor, Chair  
Research Ethics Board (REB)
TO: Kelli-an LAWRENCE, Applied Health Sciences
FILE: 04-416 LAWRENCE
TITLE: Tobacco Use in a Representative Sample of Ontario Post-Secondary Students.

The Brock University Research Ethics Board has reviewed the above research proposal.

DECISION: Accepted as clarified, however, please forward copies of ethics clearance statement obtained from other institutions for our files.

This project has received ethics clearance for the period of July 12, 2005 to December 31, 2005 subject to full REB ratification at the Research Ethics Board’s next scheduled meeting. The clearance may be extended upon request. *The study may now proceed.*

Please note that the Research Ethics Board (REB) requires that you adhere to the protocol as last reviewed and approved by the REB. During the course of research no deviations from, or changes to, the protocol, recruitment, or consent form may be initiated without prior written approval from the REB. The Board must approve any modifications before they can be implemented. If you wish to modify your research project, please refer to [http://www.brocku.ca/researchservices/forms](http://www.brocku.ca/researchservices/forms) to complete the appropriate form Revision or Modification to an Ongoing Application.

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants and the continuation of the protocol.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research protocols.

The Tri-Council Policy Statement requires that ongoing research be monitored. A Final Report is required for all projects upon completion of the project. Researchers with projects lasting more than one year are required to submit a Continuing Review Report annually. The Office of Research Services will contact you when this form Continuing Review/Final Report is required.

Please quote your REB file number on all future correspondence.
Certificate of Ethics Approval

This is to certify that the Carleton University Research Ethics Committee has examined the application for ethical approval for the research project entitled *Tobacco Use in a Representative Sample of Ontario Post-Secondary Students* submitted by Professor Linda Jessup, Ph.D. (Co-Investigator) Department of Health Studies & Gerontology, University of Waterloo and Professor Kelli-an Lawrance, Ph.D. (Principle Investigator) Department of Community Health Science, Brock University.

The committee found this project to meet appropriate ethical standards as outlined in the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans and the Carleton University Policies and Procedures for the Ethical Conduct of Research.

This certification is valid for one year from the date indicated below.

X No conditions apply
☐ Conditions apply (see below)

Date: 7 November 2005

Leslie J. MacDonald-Hicks
Research Ethics Committee Coordinator
For the Chair of the Carleton University Research Ethics Committee
Prof. Antonio Gualtieri
November 1, 2005

Researchers: Dr. Kelli-an Lawrance  
Community Health Sciences  
Brock University  
Dr. Linda Jessup  
Health Studies and Gerontology  
University of Waterloo  

Coordinator: Jillian Giesler  
University of Waterloo  
200 University Avenue West  
Waterloo, ON N2L 3G1  

Dear Researchers:

Re: REB Project #: 019 05-06  
Granting Agency name: Ontario Tobacco Research Unit  
Granting Agency Project #: N/A

Based on the recommendation of the Research Ethics Board, I am pleased to grant ethical approval to your research project entitled, “Tobacco Use in a Representative Sample of Ontario Post-Secondary Students”.

The Research Ethics Board requests an annual progress report and a final report for your study in order to be in compliance with Tri-Council Guidelines. This annual review will help ensure that the highest ethical and scientific standards are applied to studies being undertaken at Lakehead University.

Completed reports may be forwarded to:

Office of Research  
Lakehead University  
955 Oliver Road  
Thunder Bay, ON P7B 5E1  
FAX: 807-346-7749

Best wishes for a successful research project.

Sincerely,

Dr. Richard Maundrell  
Chair, Research Ethics Board

cc: Research Office
This is to certify that the research proposal entitled *Tobacco Use in a Representative Sample of Ontario Post-Secondary Students, File #2005-10-19*, submitted by Kelli-an Lawrance, Brock University, with Linda Jessup, Health Studies, U. of Waterloo on 10/28/2005 has passed an expedited ethics review by the Laurentian University Research Ethics Board.

Conditions:

Signed: [Signature]
Chair, LU Research Ethics Board

Signatures of Members

[Signature]

Department

CRaNHR

Date: Nov. 20/05

Note: this approval covers only the documents submitted, in the language in which they have been submitted. Any changes to questionnaires or procedures must be re-submitted to the Board, as stated on the form.

Start Date: November 15, 2005
Finish Date: March 30, 2006
Report Date(s): June 30, 2006
Date: Sun, 20 Nov 2005 14:04:25 -0500
From: Daphne Maurer <mrebc@chair@mcmaster.ca>
To: kell-an.lawrance@brocku.ca, ljessup@uwatertoo.ca, Michael Wilson <ethicsoffice@mcmaster.ca>
Cc: jbgiesle@uwatertoo.ca, Alison Miculan <miculan@mcmaster.ca>
Subject: Ethics protocol 04-416 (Brock); 2005-163 (McMaster)

Dear Jillian, Kelli-an, and colleagues:

The reviews are back for your protocol, Tobacco use in a representative sample of Ontario post-secondary students. The reviewers are convinced that you handled the concerns appropriately and, like me, impressed overall with the protocol.

There are two minor suggestions from the reviewers that I pass on as collegial advice. They do not require a response.

1. Survey, page 1 under Citizenship Status, the choices are Canadian and Other. If a participant identifies as Aboriginal/Native, the two choices might be confusing.
2. It would be nice to end the survey with a blurb thanking the individual for participation and contribution for research--as a respectful way of acknowledging his/her contribution. It could also mention the importance of writing down the ID number so that a participant can ask later for his/her responses to be withdrawn.

I am approving the protocol on behalf of the McMaster Research Ethics Board. You will be receiving written confirmation of approval, but in the meantime are free to begin the McMaster component of the study.

Regards,

Daphne

Daphne Maurer, Ph.D.
Chair, McMaster Research Ethics Board
Professor of Psychology
Title: "Tobacco Use in a Representative Sample of Ontario Post-Secondary Students"

Principal Researcher: Dr. Kelli-an Lawrance (Brock), Dr. Linda Jessup (Waterloo)
Jillian Giesler (Coordinator)

Faculty/Department: Multi-Centred (Brock leading)

Date of Review Decision: October 14, 2005

The Ethical Review Committee has completed the examination of your research proposal. As Chair, it is my pleasure to inform you that your proposal meets all the requirements of the ethical review.

Best Wishes with your research

Sincerely,

[Signature]

Dr. Peter Joong, Chair
Dear Ms Giesler,

On behalf of Dr. Sarah McKinnon, Vice-President, Academic, I am writing to confirm that the Ontario College of Art & Design’s Research Ethics Board has reviewed and accepted the research proposal Tobacco Use in a Representative Sample of Ontario Post-Secondary Students and therefore, our university will participate in this study. We understand that the researchers will supply our institution with the 'invitation to participate' email text to be emailed out to our students. You may contact me directly for assistance with this.

Thank you,

Hillary Barron, MA
Senior Assistant to the Vice-President, Academic
Secretary to Academic Council

T 416.977.6000 x322
F 416.598.0885
E hbarron@ocad.on.ca

ONTARIO COLLEGE OF ART & DESIGN
100 McCaul Street, Toronto, Canada M5T 1W1
www.ocad.ca <http://www.ocad.ca/>

for

Sarah M. McKinnon, PhD
Vice-President, Academic

T 416.977.6000 x233
F 416.598.0885
30 October 2005

REB #200506-004
Title: Tobacco use in a representative sample of Ontario post-secondary students

Dear Dr. Lawrance,

The Research Ethics Board (REB) has given approval to your proposal entitled “Tobacco use in a representative sample of Ontario post-secondary students”.

Please note that some issues arose in our review that may warrant consideration as you proceed with this research. These points are attached for your reference.

In accordance with the Tri-Council Guidelines (article D.1.6) your project has been approved for one year. If this research is ongoing past that time, please submit a Research Ethics Annual Update form, available through the Office of Research and Graduate Studies.

Please note that you are reminded of your obligation to advise the REB before implementing any amendments or changes to the procedures of your study that might affect the human participants. You are also advised that any adverse events must be reported to the REB.

On behalf of the Trent Research Ethics Board, I wish you success with your research.

With best wishes,

Laura J. Summerfeldt, Ph.D., C.Psych.
Associate Professor, Department of Psychology
Chair, Research Ethics Board

Phone: (705) 748-1011 ex. 1526
Fax: (705) 748-1580
Email: lsummerfeldt@trentu.ca

c.c.: Cathy Smith, Office of Research & Graduate Studies
30 October 2005

REB #200506-004
Title: Tobacco use in a representative sample of Ontario post-secondary students

Please note that the points below are provided solely for your consideration, as per Tri-Council Guidelines. No revision to your project or your ethics application is required.

Procedure
1. we recommend that provide participants with information or a web-link about the Ontario Tobacco Strategy and its accountability.
2. If book certificates are being provided courtesy of Chapters (as a corporate sponsor) that information should be given to participants somewhere in the study documentation. If the gift certificates have merely been purchased as part of the study's budget then that acknowledgement is not needed.
Dear Researcher:

The recommended revisions/additional information requested in the initial ethics review of your ORE application:

Title: Tobacco Use in a Representative Sample of Ontario Post-Secondary Students
ORE #: 12524
Principal/Co-Investigator: Dr. Kelli-an Lawrance (kelli-an.lawrance@brocku.ca)
Principal/Co-Investigator: Dr. Linda Jessup (ljessup@healthy.uwaterloo.ca)
Collaborator: Jillian Giesler (jbgiesle@uwaterloo.ca)

have been reviewed and are considered acceptable. As a result, your application now has received full ethics clearance.

A signed copy of the Notification of Full Ethics Clearance will be sent to the Principal Investigator or Faculty Supervisor in the case of student research.

ADDITIONAL REVISIONS OR RESPONSES TO COMMENTS:
N/A

******************************************************************************
Note 1: This clearance is valid for four years from the date shown on the certificate and a new application must be submitted for on-going projects continuing beyond four years.

Note 2: This project must be conducted according to the application description and revised materials for which ethics clearance have been granted. All subsequent modifications to the protocol must receive prior ethics clearance through our office and must not begin until notification has been received.

Note 3: Researchers must submit a Progress Report on Continuing Human Research Projects (ORE Form 105) annually for all ongoing research projects. In addition, researchers must submit a Form 105 at the conclusion of the project if it continues for less than a year.

Note 4: Any events related to the procedures used that adversely affect participants must be reported immediately to the ORE using ORE Form 106.

Best wishes for success with this study.

----------------------------------------
Susanne Santi, M. Math.,
Manager, Research Ethics
Office of Research Ethics
NH 1027
519.888.4567 x7163
ssanti@uwaterloo.ca
Office of Research Ethics
The University of Western Ontario
Room 00045 Dental Sciences Building, London, ON, Canada N6A 5C1
Telephone: (519) 661-5036 Fax: (519) 660-2466 Email: ethics@uwo.ca
Website: www.uwo.ca/research/ethics

Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Ms. M. Bawden
Review Number: 11854E
Protocol Title: Tobacco Use in a Representative Sample of Ontario Post-Secondary Students
Department and Institution: Nursing, University of Western Ontario
Sponsor: Ontario Tobacco Research Unit
Ethics Approval Date: November 9, 2005
Expiry Date: January 31, 2006
Documents Reviewed and Approved: UWO Protocol, Letter of Information, Email Invitation
Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research,
Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement and
the Health Canada/ICH Good Clinical Practice Practices; Consolidated Guidelines; and the applicable laws and
regulations of Ontario has reviewed and granted expedited approval to the above named research study on the approval
date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in
Division 5 of the Food and Drug Regulations.

This approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the
HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to
that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without
prior written approval from the HSREB except when necessary to eliminate immediate hazards to the subject or when the
change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number).
Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed
information/consent documentation.

Investigators must promptly also report to the HSREB:
a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) all adverse and unexpected experiences or events that are both serious and unexpected;
c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment
advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this
office for approval.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not
participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

Chair of HSREB: Dr. John W. McDonald
Deputy Chair: Susan Haddow

Ethics Officer to Contact for Further Information
Karen Kueneman  Janice Sutherland  Susan Underhill  Jennifer McEwen

This is an official document. Please retain the original in your files.

UWO HSREB Ethics Approval
2005-09-05 (MB-EDP)

11854E
September 28, 2005

Kelli-an Lawrance, Brock University
Linda Jessup, University of Waterloo
Department of Applied Health Sciences

Dear Drs. Lawrance and Jessup:


Since this project has been approved by the Brock University Research Ethics Board, I have reviewed your proposal and, on behalf of the Research Ethics Board, determined that it is ethically sound.

If the research plan and methods should change in a way that may bring into question the project’s adherence to acceptable ethical norms, please contact me as soon as possible and before the changes are put into place.


Yours sincerely,

Bill Marr, PhD
Chair, University Research Ethics Board

BM/jb
Date: Tue, 11 Oct 2005 15:53:30 -0400
From: Kelli-an Lawrance <kelli-an.lawrance@brocku.ca>
To: mhmul@uwindsor.ca
Cc: linda Jessup <lJessup@healthy.uwaterloo.ca>, "Jillian Giesler, MSc" <jbgiesle@ahsmail.uwaterloo.ca>
Subject: Re: REB Clearance-Lawrance

thank you
when the results are available, we will be sure to contact Linda to have them posted on the Windsor REB website.
~ Kelli-an

At 02:48 PM 10/11/2005, you wrote:

>Dear Kelli-Ann Lawrance,
>
>  The expedited reviewers have reviewed your project entitled "A study of tobacco use in a representative sample of Ontario post-secondary students"
>  REB #05-18. You now have clearance for this project. Linda Bunn will send you a formal letter of ethics clearance in the next few days.
>  
>  We are asking that you post the results of your study on the University of Windsor REB Study Results website. Linda can tell you more about how to do this.
>
>  We wish you success in your research endeavour.
>
>Sincerely,
>
>Dr. Muldoon
>
>Dr. Maureen Muldoon
>Chair, Research Ethics Board
>University of Windsor
>Windsor, Ontario
>N9B 3P4
>
>Telephone: 519-253-3000, #2401
>E-Mail: mhmul@uwindsor.ca

Kelli-an Lawrance, Ph.D.
Associate Professor, Community Health Science Department
Faculty of Applied Health Sciences
Brock University
500 Glenridge Avenue
St. Catharines, Ontario
L2S 3A1
(p) 905-688-5550, ext.4288
(f) 905-688-8954
Memo

To: Professor Maxine Gallander Wintre et al, Psychology
From: Alison M. Collins-Mrakas, Manager, Research Ethics
Date: Monday November 21st, 2005
Re: Ethics Approval

Tobacco Use in a Representative Sample of Ontario Post-Secondary Students

I am writing to inform you that the Human Participants Review Sub-Committee has reviewed and approved the above project.

Should you have any questions, please feel free to contact me at: 416-736-5914 or via email at: acollins@yorku.ca.

Yours sincerely,

Alison M. Collins-Mrakas M.Sc.
Manager, Research Ethics
Secretary, Human Participants Review Committee
APPENDIX B

Suggested email script for Introductory ‘Invitation to Participate’

<Institution Name> students are invited to participate in an anonymous survey.

Researchers from Brock University and the University of Waterloo are conducting a study entitled: Tobacco Use in a Representative Sample of Ontario Post-Secondary Students. Non-smokers and smokers are invited to participate. If you decided to take part in the study, you will link to a high-security website to complete an anonymous, online consent form and questionnaire. It will take you 10-15 minutes to complete the questionnaire, and when you're done, you'll be prompted to send an email that enters you in a prize draw for a 1-in-10 chance to win a $10 electronic gift certificate for Chapters Bookstore. (Note that a research coordinator will monitor email entries for the prize draw. Your email can not be traced back to your questionnaire answers, and will be held in absolute confidence until deleted immediately after the prize draws).

Your participation in the study is completely voluntary, and any information you choose to provide will always be kept secure and confidential. For more information about the study please visit www.youthvoice.ca. Visiting the site in no way obligates you to participate in the survey.

If you wish to do the questionnaire...

Use this code to enter the site: α # #
Click this link to get to the site: www.youthvoice.ca

When you finish the questionnaire, click the email link to be entered in the prize draw.

This study is funded by the Ontario Tobacco Strategy (Ontario Tobacco Research Unit). It has been reviewed by and received ethics clearance from the Research Ethics Board at Brock University (REB file # 04-416), the Office of Research Ethics at University of Waterloo (ORE file # _______) and the Research Ethics Board at <Institution Name> (REB file # ______). If you wish to discuss the study, or your rights as a participant, please contact:

the Research Ethics Officer at <Institution Name>, phone number, email>
Dr. Kelli-an Lawrence, Co-Principal Investigator, 905-668-5550 ext. 4288, kelli-an.lawrence@brocku.ca
Dr. Linda Jessup, Co-Principal Investigator, 519-888-4567 ext. 5642, ljessup@healthy.uwaterloo.ca

-------------------------------------------------------------------------------
Tobacco Use in a Representative Sample of Ontario Post–Secondary Students
Researchers: Kelli-an Lawrance PhD, Brock University; Linda Jessup PhD, University of Waterloo; and Jillian Giesler MSc, University of Waterloo
[REB #s listed]

Overview
Researchers from Brock University and the University of Waterloo are investigating tobacco use by post-secondary students in Ontario. Non-smokers and smokers are invited to participate in this research. If you take part in the study, you will:

1. read the information below
2. click an icon to show you consent to be in the study
3. fill in the anonymous on-line questionnaire
4. enter a draw for a 1-in-10 chance to win a $10 voucher for ‘Chapters Bookstore’

Background & Purpose of the Study
While most smoking initiation takes place by the end of high school, over 20% of smokers make the transition to regular smoking shortly after leaving high school. U.S. data shows that daily smoking by full time post-secondary students rose approximately 60% over the period 1990 to 1999 in comparison to a rise of 25% for non-students. Much less is known about smoking by Canadian post-secondary students. This study will shed light on patterns of smoking and not smoking by Canadians post-secondary students, and whether the U.S. experience is mirrored in Ontario.

If you decide to take part in the study, you can expect to spend 10-15 minutes answering questions about your own use or non-use of tobacco; your past and current educational experiences; your family background; your social network; and your opinions of smoking policies and laws. Although you may not benefit personally from your participation in this study, the information that you and your peers provide will add significantly to the understanding of tobacco use by college and university students and should lead to better tobacco programming at Canadian post-secondary institutions.

A total of 26 Ontario-based university and college campuses are participating in this research. It is expected that a minimum of 5,000 students or slightly more than 1% of the entire full-time post-secondary population of Ontario will participate in the study.

Research Procedures & Confidentiality of Your Data
On-line Questionnaire. This site uses SSL-enabled (128 bit encryption) security, with encryption at both access to the site and access to the database it produces. (This level of security encryption is used by financial institutions). Email hyperlinks to and from this site can not be traced back to you. Furthermore, all email correspondence between you and the research personnel will be password protected, and occur from a single computer located in a locked office on the University of Waterloo campus. Only one researcher will have access to your email address and correspondence; and that individual will never have concurrent access to your data (i.e., the data will be stored in a separate file ensuring that none of the researchers can ever link you and your email address to your answers). In this way, your anonymity and the anonymity of your data remain secure.
The researchers want you to be aware that they judge the risks associated with participation in this study to be minimal. They would also like to stress that you can choose not to participate without risk of any penalty, and you may choose not to answer any particular question or questions.

**Your 'Identification' Number.** To maintain your anonymity, you are not pre-assigned an identification number. Instead, a number is randomly generated by computer software when you initiate the questionnaire. At the end of the questionnaire, a screen will appear advising you of this number. You are the only person who knows what your identification number is. You should write it down: if you ever decide withdraw from the study, this number offers the only way that your data can be identified for deletion from the dataset.

(If you decide to withdraw from the study while completing the questionnaire, you will not receive an identification number because incomplete data will be excluded from analyses anyway. You will, however, be prompted to enter the prize draw if you wish to.)

**Prize Draw.** The on-line questionnaire concludes with a thank you letter and a message advising you to click the link provided if you wish to enter the prize draw to win a $10 Chapters Bookstore gift certificate. By clicking the prize draw link, you are signifying your consent to be entered in the prize draw. (If you decide to withdraw from the study while completing the survey, click the <WITHDRAW> button: it ends the questionnaire and opens the prize draw link.)

The link will automatically generate an email letter addressed to youthvoice@brocku.ca. Ensure that your email address is included in that letter so you can be contacted if you win! Emails to youthvoice@brocku.ca will be monitored by one researcher and retained in a secure electronic database separate from your questionnaire responses. The researcher will conduct prize draws and send email addresses of the prize winners to Chapters Bookstore personnel. Chapters Bookstore personnel will then email winners their unique electronic gift certificate and instructions about how to use it. Electronic Gift Certificates never expire. They can be applied to purchases made online (www.chapter.indigo.ca), but are not redeemable at in-store locations.

**Handling of Data.** Your answers to the questionnaire go straight into an anonymous, high-security database that includes only your randomly-generated identifier code, never your email address. All the information you provide will always be kept secure and confidential; your data remain completely anonymous to all of the researchers. The electronic data set will be password protected and treated confidentially, accessible only to the researchers, research assistants in their employ, or students under their supervision. Electronic data sets will be stored indefinitely in locked cabinets in a locked office. The information you provide will be used for research purposes only. In future, the researchers may reanalyse the data to answer tobacco-related questions that were not addressed in initial analyses. Such analyses will be conducted for research purposes only, under conditions of strict anonymity, by the researchers or under their supervision.

**Reporting of Results.** The results of this study will be reported through lay, professional, and academic venues (e.g., conferences, journal articles, web pages, etc.). All reports will refer to grouped data and not to any individuals. You and your answers can not be identified in any way. For your own copy of the results, see www.LeaveThePackBehind.org in early summer, 2006.

**Other Information about the Study**

This study is funded by the Ontario Tobacco Strategy (Ontario Tobacco Research Unit) and has received ethics clearance through the Research Ethics Board at Brock University (REB file # 04-416), Lakehead University (REB file # ______), McMaster University (REB file # ______), Nipissing University (REB file # ______), Ontario College of Art & Design (REB file # ______), Queens University (REB file # ______), Trent University (REB file # ______), University of Ontario Institute of Technology (REB file # ______), University of Waterloo (REB file # ______), University of Western Ontario (REB file # ______), University of Windsor (REB file # ______), Wilfrid Laurier University (REB file # ______), and York University (REB file # ______).
If you wish to discuss issues arising from participation, please contact: <roll-over>
Dr. Kelli-an Lawrence, Co-Principal Investigator, 905-688-5550 ext. 4288, kelli-an.lawrence@brocku.ca
Dr. Linda Jessup, Co-Principal Investigator, 519-888-4567 ext. 5642, ljessup@healthy.uwaterloo.ca
Or the Research Board at your institution:
Brock University – Linda Rose-Krasnor, Chair, Research Ethics Board, 905-688-5550 ext. 3870, Linda.Rose-krasnor@brocku.ca
Lakehead University – Lisa Norton, Research Ethics and Administration Officer, (807) 343-8110 ext. 8283, lisa.norton@lakeheadu.ca
McMaster University - Mr. Michael Wilson, Research Ethics Officer, Office of Research Services, 905-525-9140, ext. 23142, ethicsoffice@mcmaster.ca
Nipissing University – Janet Ross, Research Ethics Coordinator, 705-474-3461 ext. 4558, janetr@nipissingu.ca
Ontario College of Art & Design - Hillary Barron, Senior Assistant to the Vice-President, Academic, 416-977-6000 ext. 322, hbarron@ocad.on.ca
Queens University - Dr. Joan Stevenson, Chair, General Research Ethics Board, 613-533-6288, stevens@post.queensu.ca
Trent University – Office of Research, 705-748-1011 ext. 7245, research@trentu.ca
University of Ontario Institute of Technology - Jennifer Freeman, Manager, Office of Research Services, 905.721.3111 ext. 3176, jennifer.freeman@uoit.ca
University of Waterloo – Dr. Susan Sykes, Director, Office of Research Ethics, 519-888-4567 ext. 6005, ssyskes@uwaterloo.ca
University of Western Ontario - Susan Hoddinott, Director, Office of Research Ethics, 519-661-3036 ext. 84692, hoddinott@uwo.ca
University of Windsor – Ms Linda Bunn, Research Ethics Coordinator, 519-253-3000 ext. 3916, lbunn@windsor.ca
Wilfrid Laurier University - Dr. Bill Marr, Chair, University Research Ethics Board, 519-884-0710 ext. 2468, bmarr@wlu.ca
York University – York University’s Human Participants Review (‘Ethics’) Sub-Committee, 416-736-5055, research@york.ca

If you wish to withdraw, at any time, for any reason, with no penalty, send an email to lbbsstudy@brocku.ca, being sure to use your identification number on that correspondence. The mailbox is monitored by an Administrative Assistant who has never has access to you data. She will advise the researchers only of your identification number and instructions to withdraw that data from the study. Your email address will never be shared, and you email correspondence will be immediately deleted.

Questions? Click FAQ in the navigation bar.

Thank you for your interest in our study!

Bookmark this website to access the information / consent page at any time.
PRINT this information / consent page for your personal records.
Statement of Consent

I agree to participate in the study entitled ‘Tobacco Use in a Representative Sample of Ontario Post-Secondary Students’. I have made this decision based on the information I have received in the on-line information letter. I have had the opportunity to request any additional details I want about this study (by clicking the FAQ button or contacting the research office), and any questions I may have had have been answered. As a participant in this study, I realize that I will be asked to complete an on-line questionnaire, I may choose not to answer specific questions, and I can withdraw my consent to participate at any time, for any reason, without penalty. I understand that, by clicking the hyperlink to enter the prize draw, I am giving consent to prize draw procedures. I have been informed of the names and phone numbers of the researchers, and the Ethics Officers at Brock University and the University of Waterloo, and the ethics officers at my own institution.

I consent to participate. I decline.

AGREE EXIT

This screen must be completed before access to the survey is granted.
In order to determine whether you are eligible, enter the institutional code we emailed you, and your age.

Institution Code: ____________________________

Age Today: (in years/months) ____________

Let’s begin with some information about you, and your family. Indicate the answer that comes closest to describing you.

Gender
☐ 1. female
☐ 2. male
☐ Refuse to answer

Date of birth ____________

If you weren’t born in Canada, when did you arrive in Canada? ____________

Citizenship status:
☐ 1. Canadian
☐ 2. Other (please specify) ____________________________
☐ Refuse to answer

What is your first language? ____________________________

Marital status:
☐ 1. Single
☐ 2. Other (please specify) ____________________________
☐ Refuse to answer

How many children do you have? ____________

How many children do you have that live with you? ____________

Do you consider yourself to have moved out permanently from the home of your parent(s) or guardian(s)?
☐ 1. Yes
☐ 2. No
☐ Refuse to answer
What option best describes where you live?
☐ 1. in campus residence
☐ 2. at my family home
☐ 3. with another family (boarding)
☐ 4. off campus – alone
☐ 5. off campus – with other students
☐ 6. off campus – with non students
☐ 7. off campus – with students and non students
☐ 8. off campus – with romantic partner or spouse
☐ Refuse to answer

Screen #2

The next series of questions ask about your friends' and your family members' use of cigarettes.

How many people do you consider to be in your immediate family? ____________

How often do the members of your immediate family smoke cigarettes?

<table>
<thead>
<tr>
<th></th>
<th>0. Never</th>
<th>1. Once or twice a month</th>
<th>2. On some days each week</th>
<th>3. Almost every day</th>
<th>4. Every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family member 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family member 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family member 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family member 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family member 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Think of your 4 closest male friends. How often do your 4 closest male friends smoke cigarettes?

<table>
<thead>
<tr>
<th></th>
<th>0. Never</th>
<th>1. Once or twice a month</th>
<th>2. On some days each week</th>
<th>3. Almost every day</th>
<th>4. Every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Friend 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Friend 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Friend 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Friend 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Think of your 4 closest female friends. How often do your 4 closest female friends smoke cigarettes?

<table>
<thead>
<tr>
<th></th>
<th>0. Never</th>
<th>1. Once or twice a month</th>
<th>2. On some days each week</th>
<th>3. Almost every day</th>
<th>4. Every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Friend 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Friend 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female Friend 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Think about room-mates, or people who are not immediate family with whom you share housing (people with whom you share a dorm room, or an apartment or a house).

How many people do you share housing with? 

How often do your room-mates smoke cigarettes? (If you don’t have roommates skip this question)

<table>
<thead>
<tr>
<th></th>
<th>0. Never</th>
<th>1. Once or twice a month</th>
<th>2. On some days each week</th>
<th>3. Almost every day</th>
<th>4. Every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room-mate 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Room-mate 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Room-mate 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Room-mate 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Room-mate 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Are any of your room-mates also among your “closest friends”? (If you don’t have roommates skip this question)

☐ 1. Yes
☐ 2. No
☐ Refuse to answer

If Yes, specify who (e.g. Male Friend #2 and Roommate#1 are the same person):

________________________________________

Think about the house, apartment, or room that you live in right now. Not counting yourself, how many people smoke every day or almost every day?

Think about the place where you live right now. In that living arrangement is indoor smoking restricted?

☐ 1. Yes
☐ 2. No
☐ Refuse to answer

(If Yes) Do you follow these restrictions?

☐ 1. Never
☐ 2. Sometimes
☐ 3. Always
☐ Refuse to answer

To the best of your knowledge, are the indoor smoking restrictions in your living arrangement:

☐ 1. University/College policy
☐ 2. Municipal by-law
☐ 3. Provincial law
☐ 4. limited to your living arrangement
Tobacco Use in a Representative Sample of Ontario Post-Secondary Students.

☐ Refuse to answer

Think about the place where you live right now. In that living arrangement is outdoor smoking restricted?
☐ 1. Yes
☐ 2. No
☐ Refuse to answer

(If Yes) Do you follow these restrictions?
☐ 1. Never
☐ 2. Sometimes
☐ 3. Always
☐ Refuse to answer

To the best of your knowledge, are the outdoor smoking restrictions in your living arrangement:
☐ 1. University/College policy
☐ 2. Municipal by-law
☐ 3. Provincial law
☐ 4. limited to your living arrangement
☐ Refuse to answer

Screen #3

Before we ask about your own experiences with cigarettes and smoking, we would like to know more about your high school experiences and your current post-secondary education. Please indicate the answer that comes closest to describing you.

What is your highest level of education prior to your current program:
☐ 1. Grade 11 – from Quebec or Nfld only
☐ 2. Grade 12 – from any province other than Quebec, Nfld.
☐ 3. CEGEP – Quebec
☐ 4. OAC – Ontario
☐ 5. Community College Diploma or Certificate
☐ 6. Specialized training (e.g. hairdressing, welding, massage therapy, trade apprenticeship, etc.)
☐ 7. University Undergraduate Degree
☐ 8. Other (specify) _______________________
☐ Refuse to answer

When did you finish secondary school (e.g. high school)? (month/year) _______________________

Where was your secondary school (e.g. high school) located? (city/province)______________________

Indicate how well each of these statements describes your overall secondary school (e.g. high school) experience.
I got along well with my teachers.
Strongly disagree
5.

I did as little as possible; I just wanted to get by.
Strongly disagree
5.

I paid attention to the teachers.
Strongly disagree
5.

I was interested in what I was learning in class.
Strongly disagree
5.

I felt like an outsider or like I was left out of things at school.
Strongly disagree
5.

I had friends at school to whom I could talk about personal things.
Strongly disagree
5.

I liked to participate in many school activities e.g. clubs, sports, drama.
Strongly disagree
5.

People at school were interested in what I had to say.
Strongly disagree
5.

Among all students at your previous school (e.g. high school) what percent do you believe smoked cigarettes? __________ %

Among the students who smoked, how many do you believe smoked every day?
- 1. None or almost none
- 2. Minority
- 3. About half
- 4. Majority
- 5. Nearly all or all
- Refuse to answer

Current Institution:
- Alfred College
- Algonquin College
- Boreal College
- Brock University
- Cambrian College
- Canadore College

5
Tobacco Use in a Representative Sample of Ontario Post-Secondary Students.

- Carleton University
- Centennial College
- Conestoga College
- Confederation College
- Durham College
- Fanshawe College
- Fleming College
- George Brown College
- Georgian College
- Guelph University
- Humber College
- Kemptville College
- Lakehead University
- Lambton College
- Laurentian College
- Loyalist College
- McMaster University
- Michener College
- Mohawk College
- Niagara College
- Nipissing College
- Northern College
- Ontario College of Art & Design
- Ottawa University
- Queen's University
- Ridgetown College
- Royal Military College
- Ryerson University
- Sault College
- Seneca College
- Sheridan College
- St. Clair College
- St. Lawrence College
- Toronto University
- Trent University
- University of Ontario Institute of Technology
- Waterloo University
- Western University
- Wilfrid Laurier University
- Windsor University
- York University
- Refuse to answer

Current Faculty or Program of Study: ________________

Year of study in your current program: ________________

Status:
- I. Part-time
Tobacco Use in a Representative Sample of Ontario Post-Secondary Students.

☐ 2. Full-time
☐ Refuse to answer

Did you take time off school before beginning your current college/university program?
☐ 1. Yes
☐ 2. No
☐ Refuse to answer

(If yes) How long? _______

Indicate how well each of these statements describes your overall college or university experience to date

I get along well with my professors.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

I do as little as possible; I just want to get by.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

I pay attention to the professors.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

I am interested in what I am learning in class.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

I feel like an outsider or like I am left out of things at school.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

I have trouble keeping up with the workload.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

I have become good friends with other students at school.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

I feel like I am just a number to the school.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

I have friends at school that I can talk to about personal things.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

I like to participate in many university activities e.g. clubs, sports, drama.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
Tobacco Use in a Representative Sample of Ontario Post-Secondary Students.

1. 2. 3. 4. 5.

People at school are interested in what I have to say.
Strongly disagree Disagree Neither agree nor disagree Agree Strongly agree
1. 2. 3. 4. 5.

Among all students at your college or university, what percent do you believe smoke cigarettes? ________%

Among just those students who smoke, what percent do you believe smoke every day?
☐ 1. None or almost none
☐ 2. Minority
☐ 3. About half
☐ 4. Majority
☐ 5. Nearly all or all
☐ Refuse to answer

Are there smoking regulations that restrict indoor smoking at your school?
☐ 1. Yes
☐ 2. No
☐ Refuse to answer

(If Yes) Do you follow these regulations?
☐ 1. Never
☐ 2. Sometimes
☐ 3. Always
☐ Refuse to answer

To the best of your knowledge, are the indoor smoking restrictions at your school:
☐ 1. University/College policy
☐ 2. Municipal by-law
☐ 3. Provincial law
☐ Refuse to answer

Are there smoking regulations that restrict outdoor smoking at your school?
☐ 1. Yes
☐ 2. No
☐ Refuse to answer

(If Yes) Do you follow these regulations?
☐ 1. Never
☐ 2. Sometimes
☐ 3. Always
☐ Refuse to answer

To the best of your knowledge, are the outdoor smoking restrictions at your school:
☐ 1. University/College policy
We would like to ask some questions about your smoking and health. Indicate the answer that comes closest to describing you, or to describing your opinion.

At university/college entrance, and at this time, would you consider yourself a:

1. non-smoker, who never smokes
2. non-smoker, who smokes sometimes
3. light smoker
4. regular smoker
5. ex-smoker who has totally quit smoking

1. Have your ever smoked even a puff of a cigarette?
   ☐ 1. Yes
   ☐ 2. No
   ☐ Refuse to answer

   (If Yes) How old were you when you smoked your first puff of a cigarette?

2. Have you ever smoked a whole cigarette?
   ☐ 1. Yes
   ☐ 2. No
   ☐ Refuse to answer

   (If Yes) How old were you when you smoked your first whole cigarette?

3. Have you smoked 100 cigarettes in your life?
   ☐ 1. No
   ☐ 2. Yes
   ☐ Refuse to answer

4. Have you ever been a smoker?
   ☐ 1. Yes
   ☐ 2. No
   ☐ Refuse to answer

   (If Yes) How old were you when you became a smoker?
5. Are you an ex-smoker?
   - 1. No
   - 2. No, I still smoke occasionally or regularly
   - 3. Yes, I quit within the last 6 months
   - 4. Yes, I quit more than 6 months ago → How old were you when you quit?
   - Refuse to answer

6. Do you currently smoke – even just a bit? ★ Screening Question
   - 1. No
   - 2. Yes
   - Refuse to answer

7. In the past 30 days, how often did you smoke a cigarette, even a puff?
   - 1. every day
   - 2. almost every day
   - 3. on some days each week
   - 4. once or twice all together
   - 5. I did not smoke at all
   - Refuse to answer

8. On the days that you smoked, how many cigarettes did you usually smoke?
   - 1. None (I did not smoke in the past 30 days)
   - 2. A few puffs or less
   - 3. 1-2 cigarettes per day
   - 4. 3-5 cigarettes per day
   - 5. 6-10 cigarettes per day
   - 6. 11-19 cigarettes per day
   - 7. 20 or more cigarettes per day
   - Refuse to answer

9. In the past month, how many times have you intentionally quit smoking for at least 24 hours?

10. Are you now seriously thinking of quitting smoking?
    - Yes, within the next 7 days
    - Yes, within the next 8 to 30 days
    - Yes, within the next 6 months
    - No, not thinking of quitting
    - Refuse to answer

11. When you are free to smoke whenever you want, how soon after waking do you smoke your first cigarette?
    - 1. Within 5 minutes
    - 2. Within 6 to 30 minutes
    - 3. Within 31 to 60 minutes
    - 4. Within 1-2 hrs

10
12. Think of the past week. Indicate the number of cigarettes you smoked on each day (write 0 if you did not smoke on that day). Please mark an 'L' beside any days where the majority of time was spent in leisure activities (e.g. hobbies, sports, travel, hangin' out)

<table>
<thead>
<tr>
<th># of Cigarette(s)</th>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thur</th>
<th>Fri</th>
<th>Sat</th>
<th>Sun</th>
</tr>
</thead>
</table>

13. During the past week, was your use of cigarettes:
   - 1. Greater than usual?
   - 2. Less than usual?
   - 3. About the same as usual?
   - Refuse to answer

14. Think of the past week.
   Indicate the number of tobacco products you used on each day (write 0 if you did not use that tobacco product on that day). Please mark an 'L' beside any days where the majority of time was spent in leisure activities (e.g. hobbies, sports, travel, hangin' out)

<table>
<thead>
<tr>
<th># of Cigar(s)</th>
<th>Mon</th>
<th>Tues</th>
<th>Wed</th>
<th>Thur</th>
<th>Fri</th>
<th>Sat</th>
<th>Sun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chew</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15. During the past week, was your use of cigars:
   - 1. Greater than usual?
   - 2. Less than usual?
   - 3. About the same as usual?
   - Refuse to answer

16. During the past week, was your use of chew tobacco:
   - 1. Greater than usual?
   - 2. Less than usual?
   - 3. About the same as usual?
   - Refuse to answer

Screen #5

Do you ever feel that your friends are putting pressure on you to smoke, or to smoke more often, even when you do not feel like smoking?
   - 0. Never
   - 1. Rarely
   - 2. Occasionally
Tobacco Use in a Representative Sample of Ontario Post-Secondary Students.

3. Fairly often
4. Very often
Refuse to answer

Would a non-smoker joining you feel out of place?
4. Never
3. Rarely
2. Occasionally
1. Fairly often
0. Very often
Refuse to answer

During the past month was there an occasion when you were about to smoke a cigarette but resisted the urge?
1. Yes
2. No,
Refuse to answer

In what situations do you think students at your college or university are most likely to smoke and in what situations do you smoke? (mark an 'X' beside all that apply)

<table>
<thead>
<tr>
<th>At a party</th>
<th>At a bar</th>
<th>With friends who smoke</th>
<th>In times of stress</th>
<th>Alone</th>
<th>I do not smoke</th>
</tr>
</thead>
</table>

Most Students at this University

You

People should be allowed to smoke indoors at a bar
1. Yes
2. No
3. Unsure
Refuse to answer

People should be allowed to smoke indoors at a private party
1. Yes
2. No
3. Unsure
Refuse to answer

Do you know of any programs on campus that address tobacco and smoking?
1. Yes
2. No
Refuse to answer

What are they? (Please name as many as you can)
Tobacco Use in a Representative Sample of Ontario Post–Secondary Students.

Since September, have you visited your campus’s Student Health Care facility?

☐ 1. Yes
☐ 2. No
☐ Refuse to answer

(If yes) Did a health professional at your campus’s Student Health Care facility ask you whether you use tobacco?

☐ 1. Yes
☐ 2. No
☐ Refuse to answer

(If yes) Which health professional(s) asked about your smoking?

☐ 1. doctor
☐ 2. nurse
☐ 3. counselor
☐ 4. therapist
☐ 5. other
☐ Refuse to answer

Did the health professional(s) at your Student Health Facility advise you to quit?

☐ 1. No, because I don’t smoke
☐ 2. No, none of the health professionals advised me to quit
☐ 3. Yes, at least one health professional advised me to quit
☐ Refuse to answer

(If yes) Were you offered any of these types of assistance?

☐ 1. resources, such as pamphlets, booklets, brochures, etc.
☐ 2. verbal information about how to use nicotine gum or the patch
☐ 3. a prescription for smoking cessation medication (e.g., Zyban)
☐ 4. referred you to another health professional
☐ 5. advice to to make a follow-up appointment to talk about quitting
☐ 6. verbal information about campus programs (e.g., Leave The Pack Behind)
☐ Refuse to answer

In general, compared to others your age, would you say your health is:

☐ 5. Excellent
☐ 4. Very good
☐ 3. Good
☐ 2. Fair
☐ 1. Poor
☐ Refuse to answer

Do you consider yourself to be (choose one)?

☐ 1. Very overweight
☐ 2. Somewhat overweight
☐ 3. Normal weight
Tobacco Use in a Representative Sample of Ontario Post–Secondary Students.

☐ 4. Somewhat underweight
☐ 5. Very underweight
☐ Refuse to answer

What is your present weight? (Please indicate in the text box and include whether this is in pounds or kilograms.)

How tall are you? (Please indicate in the text box and include whether this is in cm or feet and inches)

Screen #6

Please recall that you can choose not to answer any particular question or questions.

We are interested in your relationship with the parent(s) or guardian(s) you lived with as a teenager. In answering the questions, think about the parent(s) or guardian(s) you lived with the majority of the time while you were in high school.

What do you think was usually true or usually false about your father (stepfather, male guardian) when you were in high school? Select not applicable if you did not live with him the majority of the time.

I could count on him to help me out, if I had some kind of problem.
☐ Usually true ☐ Usually false ☐ Not applicable

He kept pushing me to do my best in whatever I did.
☐ Usually true ☐ Usually false ☐ Not applicable

He kept pushing me to think independently.
☐ Usually true ☐ Usually false ☐ Not applicable

He helped me with my school work if there was something I did not understand.
☐ Usually true ☐ Usually false ☐ Not applicable

When he wanted me to do something, he explained why.
☐ Usually true ☐ Usually false ☐ Not applicable

What do you think was usually true or usually false about your mother (stepmother, female guardian) when you were in high school? Select not applicable if you did not live with her the majority of the time.

I could count on her to help me out, if I had some kind of problem.
☐ Usually true ☐ Usually false ☐ Not applicable
She kept pushing me to do my best in whatever I did.

- Usually true
- Usually false
- Not applicable

She kept pushing me to think independently.

- Usually true
- Usually false
- Not applicable

She helped me with my school work if there was something I didn’t understand.

- Usually true
- Usually false
- Not applicable

When she wanted me to do something, she explained why.

- Usually true
- Usually false
- Not applicable

When you got a poor grade in high school, how often did your parent(s) or guardian(s) encourage you to try harder?

- Never
- Sometimes
- Usually
- Refuse to answer

When you got a good grade in high school, how often did your parent(s) or guardian(s) praise you?

- Never
- Sometimes
- Usually
- Refuse to answer

When you were in high school, how much did your parent(s) or guardian(s) really know who your friends were?

- Didn’t know them at all
- Knew them a little
- Knew them a lot
- Refuse to answer

When you were in high school, how often did your parent(s) or guardian(s) just spend time talking with you.

- Almost every day
- A few times a week
- A few times a month
- Almost never
- Refuse to answer

When you were in high school, how often did your family do something fun together.

- Almost every day
- A few times a week
- A few times a month
- Almost never
- Refuse to answer

During your last year of high school, in a typical week what was the latest you could stay out on a SCHOOL NIGHT (Monday to Thursday)?

- Not allowed out
- Before 8:00
- 8:00 to 8:59
- 9:00 to 9:59
- 10:00 to 10:59
- 11:00 or later
- As late as I wanted
- Refuse to answer

During your last year of high school, what was the latest you could stay out on FRIDAY or SATURDAY NIGHT?

- Not allowed out
- Before 9:00
- 9:00 to 9:59
- Refuse to answer
Tobacco Use in a Representative Sample of Ontario Post–Secondary Students.

When you were in high school did your parent(s) or guardian(s) know exactly where you were most afternoons after school?
☐ Yes  ☐ No  ☐ Refuse to answer

When you were in high school, how much did your parent(s) or guardian(s) TRY to know where you went at night?
☐ Didn’t try at all  ☐ Tried a little  ☐ Tried a lot  ☐ Refuse to answer

When you were in high school, how much did your parent(s) or guardian(s) TRY to know what you did with your free time?
☐ Didn’t try at all  ☐ Tried a little  ☐ Tried a lot  ☐ Refuse to answer

When you were in high school, how much did your parent(s) or guardian(s) TRY to know where you were most afternoons after school?
☐ Didn’t try at all  ☐ Tried a little  ☐ Tried a lot  ☐ Refuse to answer

When you were in high school, how much did your parent(s) or guardian(s) REALLY know where you went at night?
☐ Didn’t know at all  ☐ Knew a little  ☐ Knew a lot  ☐ Refuse to answer

When you were in high school, how much did your parent(s) or guardian(s) REALLY know what you did with your free time?
☐ Didn’t know at all  ☐ Knew a little  ☐ Knew a lot  ☐ Refuse to answer

When you were in high school, how much did your parent(s) or guardian(s) REALLY know where you were most afternoons after school?
☐ Didn’t know at all  ☐ Knew a little  ☐ Knew a lot  ☐ Refuse to answer

Screen #7

Finally, we would like to ask some questions about your use of substances other than Tobacco. Indicate the answer that comes closest to describing you, or to describing your opinion. For the following questions, cannabis includes marijuana, grass, pot, hash oil etc. And an alcoholic drink includes a bottle of beer or a bottled cooler, a 4 oz glass of wine, or a 1 oz shot of spirits.

Think of the past 30 days. In the past 30 days, how often did you use cannabis?
☐ 4. every day
☐ 3. almost every day
☐ 2. on some days each week
☐ 1. once or twice all together
Tobacco Use in a Representative Sample of Ontario Post-Secondary Students.

- 0. not at all
- Refuse to answer

During the past 30 days, was your use of cannabis:
- 1. Greater than usual?
- 2. Less than usual?
- 3. About the same as usual?
- Refuse to answer

How old were you when you first consumed cannabis?

_________

Among all students at your previous school (e.g. high school) what percent do you believe used cannabis? _________%

Among all students at your college or university, what percent do you believe use cannabis?

_________

Among just those students who use cannabis, how many do so at least once a week?
- None or almost none
- Minority
- About half
- Majority
- Nearly all or all
- Don’t know
- Refuse to answer

Think about the past 30 days. In the past 30 days, how often did you consume alcohol?
- 4. every day
- 3. almost every day
- 2. on some days each week
- 1. once or twice all together
- 0. not at all
- Refuse to answer

During the past 30 days, was your use of alcohol:
- 1. Greater than usual?
- 2. Less than usual?
- 3. About the same as usual?
- Refuse to answer

How old were you when you first consumed a whole alcoholic drink?

_________

Among all students at your previous school (e.g. high school) what percent do you believe drank alcohol?

_________ %
Among all students at your college or university, what percent do you believe drink alcohol?

% 

Among just those students who drink alcohol, how many do so at least once a week?

- None or almost none
- Minority
- About half
- Majority
- Nearly all or all
- Don't know
- Refuse to answer

Is there anything else you would like to say about the study?
Disclaimer: Ontario Municipal Bylaw Report, updated February 2, 2005

The information provided in this report has been interpreted by OCAT staff from municipal bylaws. Please note that these by-laws may be amended from time to time. OCAT assumes no responsibility for the accuracy of the information contained herein. For complete clarification, please refer to the actual bylaw, or speak with the municipal clerk.

The following smoke-free bylaw analysis is divided into five groups:

1. 100% smoke-free public place and/or workplace bylaws
2. Public place and/or workplace smoke-free bylaws
3. Smoke-free municipally owned buildings bylaws
4. Municipalities with no smoke-free bylaws
5. "Proprietor's choice" smoke-free bylaws

There are 445 municipalities in Ontario. In this report, every municipality is represented in one of the five groups above. Please refer to the Association of Municipalities website (www.amo.on.ca/amomore.htm) to view groupings of municipalities based on regions, counties, and districts.

Exclusions:

1. Smoking "policies" (as distinct from "bylaws"). This means that some municipalities are placed into group four, despite having a minimal level of protection. Policies will never be stronger than restricting or prohibiting smoking in municipal buildings.
2. Bylaws that do not apply to the entire municipality, but only particular areas prior to amalgamation.

1. 100% smoke-free public place and/or workplace bylaws

100% smoke-free bylaws are "Gold" standard bylaws. "Gold" standard bylaws are those considered by the Ontario Tobacco-Free Network (OTN) (www.otfn.org) to have 100% smoke-free restaurants, bars, bowling alleys, billiard halls and bingo halls with no allowance for DSRs. Private club exemptions are permitted. The bylaws in this group include those which have passed but are not yet implemented, and those that are currently in force. Assignment to this category is based on final date of implementation (i.e. a phased-in bylaw that is "Silver" first but is "Gold" on the final date of implementation will be put into group one.

The categories examined in group one are: eating establishments, bars, bingo halls, bowling alleys, billiards, casinos, slots, taxis, private clubs, patios, municipal buildings, workplaces, proprietors' obligations, enforcement, DSR (designated smoking room), OTN (Ontario Tobacco-Free Network) standard, and implementation date (month/day/year). Selection of categories is limited due to size considerations. The omission of a public place and/or workplace category (i.e. senior residences) does not mean it does not appear in some bylaws.

2. Public places and/or workplaces smoke-free bylaws

Group two consists of smoke-free bylaws that are not "Gold" in their final date of implementation. "Silver" (www.thewm.org) bylaws are included into group two ("Silver" standard bylaws must have at least 100% smoke-free restaurants, but may exempt bars, bingo halls, bowling alleys and billiards. DSRs are also permitted). The weakest group two bylaws are those which do not regulate any of the examined chart categories, but do provide regulations for public places and/or workplaces other than municipal buildings (group three).

The categories examined in group two are: eating establishments, bars, bingo halls, bowling alleys, billiards, casinos, slots, taxis, private clubs, patios, municipal buildings, workplaces, proprietors' obligations, enforcement, DSR (designated smoking room), OTN (Ontario Tobacco-Free Network) standard, and implementation date (month/day/year). Selection of categories is limited due to size considerations. The omission of a public place and/or workplace category (i.e. senior residences) does not mean it does not appear in some bylaws.

Definitions of Categories:

Public Place – Refers to a place to which the public has access by right or by invitation, expressed or implied, whether by payment of money or not, but does not include a place when used exclusively by one or more individuals for a private gathering or personal purpose.
Workplace – Refers to a place to which an employee works (employee can also mean “volunteer” depending on the definition of employee), and generally includes washrooms, corridors, lounges, eating areas, reception areas, elevators, foyers, hallways, stairways, parking garages, factory floors, etc. Private dwellings that are also workplaces are exempted.

Designated Smoking Room (DSR) – Refers to a separately-enclosed, separately-ventilated room. The DSR must satisfy certain ventilation and size criteria. Please note that a “yes” or “no” designation in the DSR category applies only to those categories included in the chart. There may be a DSR for a category not listed.

Eating establishments – This is a general term that applies to places where food is the major source of sales. Such places include restaurants, cafes, food courts, cafeterias, ice cream parlors, tea or lunch rooms, dairy bars, coffee shops, donut shops, snack bars, places of refreshment, dinner theatres, and banquet rooms. Some bylaws will include bars under their definition of an eating establishment.

Private Club – Refers to places used exclusively by one or more individuals for private use. Private clubs include Canadian Legion Branches. Private Clubs are usually defined by the following criteria:

- Fixed membership, membership fees, membership cards
- Not open to the public and does not solicit business from the public.
- Elected executive
- Governing constitution and bylaws
- Operated on a not-for-profit basis
- Members cannot consume food or alcohol unless accompanied by a member.

Smoke-free bylaws cover private clubs in the following ways:

1. Private clubs are fully exempt, despite any other public place or workplace provisions.
2. Under a public place bylaw, private clubs are exempt only if they are not open to the public.
3. Under a workplace bylaw, private clubs are exempt only if they do not have paid employees and/or volunteers (many newer bylaws are including “volunteer” in the definition of “employee” in order to cover all types of workers and therefore ensure private clubs are not exempt from workplace regulations).
4. Under a workplace and public place bylaw, private clubs are exempt only if they are not open to the public and/or not a workplace with paid employees and/or volunteers.

Keep in mind the above scenarios when reviewing the bylaw summaries for the various municipalities. For example, while private clubs may be listed as being exempt from a municipal bylaw, under certain conditions, it may be covered if it is open to non-members and/or has employees, paid or volunteers.

Municipal Buildings – Refers to buildings owned by the municipality. Includes libraries, civic centres, community centres, recreational complexes, administration buildings, Town Halls and other municipally owned or municipally operated facilities.

N/A – “Not applicable” is designated to municipalities which do not have casinos or slots (includes racetracks), or specific provisions for these types of establishments.

Please note that specific bylaw provisions for any category will override general provisions made for public places and/or workplaces.

3. Smoke-free municipally-owned buildings bylaws

Municipalities that fall into this category do not have public place and/or workplace bylaws, but have bylaws that prohibit or restrict smoking in one or more municipal buildings. Municipal buildings covered include libraries, civic centres, community centres, recreational complexes, administration offices/buildings, Town Halls and other municipally owned or operated facilities. Some smoke-free bylaws in this category will prohibit smoking in all municipal buildings, whereas some will only prohibit smoking in particular buildings, or rooms.

4. Municipalities with no smoke-free bylaws

This group includes those municipalities that do not have public place and/or workplace or municipal building smoke-free bylaws.

5. “Proprietor’s choice” smoke-free bylaws

These bylaws allow proprietors the choice to maintain a 100% smoke-free business, or permit smoking in designated areas.

Please scroll down to the next page for group one smoke-free bylaws