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**Dimensions of Ethnicity as Predictors
of Adolescent Cigarette Smoking**

by

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A thesis submitted in conformity with the requirements
for the degree of Master of Science
Graduate Department of Community Health
University of Toronto

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Abstract

Cigarette smoking is the major source of preventable disease and death in Canada (Ashley, 1995) and the United States (U.S.D.H.H.S., 1994). Although there is some evidence that the prevalence and patterns of cigarette use may vary among different ethnic groups, the influence of ethnicity on adolescent smoking has not been studied. In light of the recent increase in rates of youth smoking and the diverse ethnic and cultural makeup of Canada's population, the issue of ethnicity and adolescent smoking requires further investigation. The purpose of the present study is to examine the relationship between ethnicity and adolescent smoking.

OBJECTIVES: The objectives of the present study were: 1) to identify differences in smoking status among adolescents from various ethnic backgrounds, and 2) to determine whether dimensions of ethnicity, namely level of acculturation, strength of ethnic identity and immigration status, were significant predictors of adolescent smoking. **RESEARCH**

DESIGN: Self-report questionnaires were administered to 445 students (mean age = 16.64 years, $SD = .71$) in Grade 11 classrooms at six randomly selected and ethnically diverse high schools in Toronto. Based on self-reported ethnic background, students were divided into the following broad ethnic categories (which is consistent with the ethnic makeup of students in Toronto): Anglo (22.2%), Asian (27.4%), European (28.3%) and Other (22.0%). Smokers were defined as those students who smoked one or more cigarettes in the past 12 months.

RESULTS: Smoking status of students differed significantly between ethnic groups, $\chi^2 (3, N = 427) = 22.86, p < .001$. Anglo students were most likely to be smokers (46.32%), followed by European (43.80%), Other (34.04%) and Asian (18.8%). A significantly higher percentage of Canadian-born students were smokers compared to Foreign-born students (45.71% vs. 21.43%) and second generation students were more likely to be smokers than first generation students (46.56% vs. 30.51%). Logistic regression analysis identified age, socioeconomic status, strength of ethnic identity, place of birth and friends' smoking as significant predictors of smoking status. **CONCLUSIONS:** The results indicate that there are differences in smoking status among adolescents from different ethnic backgrounds. Furthermore, it appears that as foreign-born adolescents immerse into Canadian society, they may be more likely to engage in cigarette use. Tobacco control programs should not only take into account ethnic differences in rates of smoking but should also address various aspects of ethnicity, such as the acculturation process, as important factors in youth smoking.

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Review of Literature

Adolescent Cigarette Smoking: Overview

Today, cigarette smoking continues to be the major source of preventable disease and death in both Canada (Health Canada, 1996) and the United States (USDHHS, 1994). Health Canada estimates that nearly 30 percent of all deaths in this country are caused by smoking (Ashley, 1995) and one-half of all regular smokers are expected to die as a result of smoking (USDHHS, 1988). Although adolescents have been a central target of tobacco control interventions, many young people continue to experiment with and take up cigarette use.

In light of the observation that 90 percent of adult smokers take up smoking as teenagers (Chollat-Traquet, 1992), adolescent tobacco use represents an important public health concern and a critical focus in cancer prevention. While rates of tobacco use among adolescents and young adults declined markedly in the 1970's and early 80's, this pattern has leveled off and youth smoking appears to be on the rise once more (Health Canada, 1996; Johnstone, O'Malley, & Bachman, 1995). Data from the 1994 Youth Smoking Survey indicated that twenty-four percent of Canadians between ages 15 and 19 are current smokers compared to twenty-one percent in 1990 (Health Canada, 1995). Ten percent of Canadian youth between the ages of 10 to 19 years smoke cigarettes on a daily basis (Health Canada, 1996). The most recent Ontario Student Drug Use Survey, a bi-annual survey of students in grades 9 to 13, showed a significant increase in rates of smoking among high school students in the last two years (Adlaf, Ivis, Smart, & Walsh, 1995; Adlaf, Ivis, Smart, & Walsh, 1997), with 28 percent of students reporting cigarette use in the past 12 months.

The long-term health consequences of cigarette smoking, including cardiovascular disease, respiratory illness and stroke, and different types of cancer, are well documented (USDHHS, 1988; USDHHS, 1989). Smoking also leads to acute health problems among children and adolescents such as lowered fitness level, shortness of breath, diminished lung function and respiratory disease (Perry & Stauffer, 1996; USDHHS, 1988). Early uptake of cigarette use is associated with heavier use (i.e., more cigarettes smoked per day) and more years of smoking, both of which significantly increases the risk of developing smoking-related diseases (Shopland & Burns, 1993). Furthermore, adolescent smoking has been linked, though not causally, with poor academic performance, school absenteeism, violence and aggression and precocious sexual behaviours (USDHHS, 1994). Tobacco is considered as a “gateway” drug for teenagers, leading to experimentation with and potential abuse of alcohol and illicit drugs (Gold, 1995). Ultimately, continued cigarette use during adolescence leads to nicotine addiction. It is estimated that smoking will be responsible for the premature death of over half of today’s fifteen year old smokers (Villeneuve & Morrison, 1994).

Predictors and Correlates of Adolescent Smoking

During the past several decades, considerable research has been directed toward gaining a better understanding about cigarette smoking among youth and the multiple factors which influence this health behaviour. Numerous demographic, personal, behavioural, social and environmental factors have been identified as forces which play a role in adolescent tobacco use.

Demographic factors: According to Canada’s Youth Smoking Survey, age is a dominant factor related to cigarette smoking. Smoking consistently increases as a function of

age and grade level (Health Canada, 1996). The proportion of daily smokers rises dramatically between ten to fifteen years of age with a peak at thirteen to fourteen years and declines thereafter. With regard to socioeconomic status, children and adolescents belonging to families from lower socioeconomic backgrounds are considered to be at higher risk for tobacco use (Conrad, Flay, & Hill, 1992; Perry & Staufacker, 1996; Lowry, Kann, Collins, & Kolbe, 1996). Although young males continue to be heavier smokers (i.e., smoke more number of cigarettes per day), young females are more likely to be current smokers (15.6% versus 14.9%, respectively) (Health Canada, 1996). Furthermore, the functional meanings attached to cigarette use and the progression to regular smoking may differ by gender (Grunberg, Winders, & Wewers, 1991).

Personal factors: Personal or psychological factors which have been associated with cigarette smoking include lower self-images or self-esteem (Conrad et al., 1992), positive attitudes, beliefs and intentions towards smoking (Bhatia, Hendricks, & Bhatia, 1993), positive perceptions about the functions and utility of smoking (Perry, Murray, & Klepp, 1987), and lower self-efficacy in resisting offers to smoke (Stacy, Sussman, Dent, Burton, & Flay, 1992). Although early tobacco prevention initiatives focused on disseminating information about the negative health effects of cigarette smoking to young people, it is now known that adolescents' general knowledge about the health consequences of smoking is a poor predictor of subsequent cigarette use (Miller & Slap, 1989; Royal College of Physicians, 1992). Adolescents likely perceive the negative outcomes of health-endangering behaviours, such as cigarette smoking, as remote and of little relevance because they will not happen until the long-term future (Chassin, Presson, Sherman, & McConnell, 1995).

Behavioural factors: Certain patterns of adolescent behaviour have also been related to cigarette smoking. For example, poor academic achievement, higher truancy rates and limited educational aspirations are associated with increased likelihood of smoking (Conrad et al., 1992; Chassin, Presson, & Sherman, 1990; Newcomb, McCarthy, & Bentler, 1989). Furthermore, it has been observed that cigarette smoking “clusters” with other health-compromising or problem behaviours, including alcohol and other drug use, risk-taking and rebelliousness, and deviant or antisocial behaviours, among adolescents (Jessor & Jessor, 1977; Fleming, Leventhal, Glynn, & Ershler, 1989; Conrad et al., 1992; Chassin, Presson, & Sherman, 1989).

Social factors: Social factors have also been associated with smoking by teenagers. Indeed, by far the strongest and most consistent observation supported by the literature has been that friends, peers and families have a considerable influence on the smoking behaviour of adolescents. For example, initial experimentation with cigarettes often occurs in the presence of peers and friends (Hahn et al., 1990), and having a best friend who smokes significantly increases the likelihood that a teenager will smoke (Elder, Molgaard, & Gresham, 1988). Numerous studies, both cross-sectional and prospective, substantiate the relationship between peer smoking behaviours and attitudes and youth smoking (Leventhal, Fleming, & Glynn, 1988; USDHHS, 1994). The influence of peers can be both direct, in the form of cigarette offers or provocation, and/or indirect, in the form of modeling smoking behaviours and promoting smoking as a normative, acceptable behaviour (Flay et al., 1994).

There is also a positive relationship between sibling smoking behaviour and initiation of smoking by teenagers (Miller & Slap, 1989; USDHHS, 1994). Finally, studies have

identified parental smoking and parental attitudes toward smoking as significant predictors of adolescent smoking (Bauman, Foshee, Linzer, & Koch, 1990; Nolte, Smith, & O'Rourke, 1983), although parental influence may be more important in the preparatory or initial trying stages of smoking than during the transition to regular smoking (USDHHS, 1994). Without question, the smoking behaviour of adolescents is strongly influenced by the significant others in their lives.

Environmental factors: Finally, environmental factors which have been linked to adolescent smoking include the availability of and accessibility to cigarettes in the community, perceptions about the general extent and acceptability of smoking, pricing of cigarettes and tobacco advertising or promotion in the mass media. For example, a greater number of cigarette vending machines coupled with poor enforcement of non-smoking policies in schools increases the likelihood of smoking initiation and continuation among children and teenagers (CDC, 1992). Indeed, accessing cigarettes does not appear to be difficult for teenagers. Forty-one percent of youth between the ages of ten to nineteen years report purchasing cigarettes for themselves from a corner store (Health Canada, 1996). Similarly, eighty-eight percent of U. S. students consider it “very easy” or “fairly easy” to obtain cigarettes (Johnstone et al., 1995). Youth decisions to smoke are also found to be influenced by price changes in tobacco products (Ferrence, Garcia, Sykora, Collishaw, & Farinon, 1991).

Although a vast literature about the multiple predictors and correlates of adolescent smoking has been accumulated, current understanding about this complex phenomenon is far from complete. Adolescents have generally been treated as a homogeneous study population, with little consideration being given to the possible influence of ethnic or cultural factors on

smoking behaviour. To date, few research initiatives have been directed toward determining the prevalence of cigarette use or understanding the factors that influence smoking among ethnic groups and/or immigrants in Canada (Edwards & MacMillan, 1990). National surveys have not yielded comprehensive data about ethnicity and smoking in young people. Consequently, the impact of processes such as increasing immigration or acculturation on adolescent health and health behaviours are not well understood (Raphael, 1996). Only recently have researchers begun to focus attention on studying ethnic or racial differences in tobacco use and identifying correlates of smoking among various ethnic groups. The need for such research is great in light of the distinct ethnic and cultural makeup of Canada's population.

Canada's Multi-Ethnic Population

Canada is comprised of individuals from widely diverse ethnic origins. In the 1991 Census, a profile of cultural groups indicated that 16 percent of the population are immigrants and that more than 30 percent of Canadians report an ethnic background that is neither British nor French (Statistics Canada, 1993). In 1986, 3.5 million Canadians reported a mother tongue other than English or French (Shah, 1994). Locally, data from the Toronto Board of Education indicate that 46 percent of secondary students in the city of Toronto, Canada's most ethnically diverse city, come from racial backgrounds other than "white", 43 percent of students were born outside of Canada, and 45 percent are native speakers of a language other than English or French (Cheng, Yau, & Zeigler, 1996). Immigrants represent 21 percent of the household population in Canada (Chen, Ng, & Wilkins, 1996). Over two million immigrants live in Ontario, making up 23 percent of the province's total population. Furthermore, shifts in the sources of immigration in the past several decades from European to non-European sources

have reshaped Canada's ethnic and linguistic demographic composition (Statistics Canada, 1993). In Metropolitan Toronto alone, it is estimated that the racial minority will climb from 20.7 percent of the population in 1986 to 28.4 percent in the year 2001 (Turner, 1990).

Population projections show that immigration will play a major role in the growth and diversity of the demographic makeup of Canada during the coming decades (Perrault, Declos, Costa, Larrivee, & Loh, 1990).

Cigarette Smoking among Different Ethnic Populations

There is evidence, mostly from U. S. studies, to suggest that the prevalence and patterns of cigarette use varies significantly among different ethnic groups. For example, data from the National Health Interview Survey in the U. S. indicate that Anglos are more likely to be current smokers than Blacks and Mexican Americans (Rogers & Crank, 1988). A longitudinal study of adolescents also demonstrated significant ethnic differences in smoking behaviour (Maddahian, Newcomb, & Bentler, 1988). White and Hispanic students were more likely to be current smokers than Blacks or Asians. Most recent studies indicate that African-American adolescents are less likely to smoke than their White counterparts (Andreski & Breslau, 1993; Nelson et al., 1995; Najem, Batuman, Smith, & Feuerman, 1997; Robinson & Klesges, 1997; Williams & Covington, 1997). Also, the odds of heavy smoking for Black adults are far less than for White adults (Novotny, Warner, Kendrick, & Remington, 1988).

While some studies suggest that minority ethnic populations have lower rates of smoking than majority groups, others indicate that smoking is a special problem for minority populations. Indeed, minority groups may be edging ahead of the majority population in prevalence of adult smoking and risk of tobacco-related diseases (Ramirez & Gallion, 1993).

Both the Monitoring the Future Study (Bachman et al., 1991) and the Minnesota Student Survey (Neumark-Sztainer et al., 1996) in the U. S. showed that Native American students had the highest prevalence of smoking while Asian students had the lowest prevalence. While the prevalence of cigarette smoking among African American adolescents is relatively low, there may be a cross-over effect later in life. Rates of smoking among African American adults emerge as the highest among all ethnic subgroups (Feigelman & Lee, 1995). Puerto Rican (McGraw, Smith, Schensul, & Carrillo, 1991), Latino (Moreno et al., 1994), Vietnamese (Wiecha, 1996), and Mexican (Elder et al., 1988) teenagers have also been identified as being at increased risk for smoking compared to the general adolescent population in the United States. In one study, Black students reported higher intentions to smoke cigarettes than either Whites or Asians while Hispanics had more intention to smoke than Asians (Maddahian et al., 1988). Furthermore, regardless of socioeconomic status, Black Americans are significantly less likely than Whites to quit once regular smoking is initiated (Novotny et al., 1988).

Overall, minority ethnic groups in Canada appear to have relatively low rates of smoking. In a national survey of Canadian adults from different ethnic origins, 16 percent of foreign-born Canadians reported being regular smokers compared to 25 percent of Canadian-born residents (Health Canada, 1992). There were also variations in smoking among different minority ethnic groups. For example, Canadian Aboriginals reported the highest rates of smoking (about 59 percent are regular smokers) compared to only 11 percent among Asian Canadians (Millar, 1992). A survey of students in Ontario revealed that the highest daily cigarette consumption was reported by students of Western European descent, followed by

Jewish and Eastern European students. Oriental students reported the lowest consumption levels (Adlaf, Smart, & Tan, 1989).

However, in-depth interviews with various immigrant ethnic groups revealed that immigrants generally increase their consumption of cigarettes after arriving in Canada (Beardall & Edwards, 1995). While the 1994-95 National Population Health Survey showed that recent non-European immigrants were significantly more likely than the Canadian-born to have never smoked, the proportions of immigrants who were smokers generally increased with time spent living in Canada (Chen et al., 1996). Although studies from both the U. S. and Canada point to notable differences in smoking behaviour between different ethnic populations, definitive ethnic or cultural patterns of cigarette use have yet to be confirmed. Thus, no conclusions regarding the relationship between ethnicity and adolescent smoking can be drawn at this time.

Ethnicity and Adolescent Smoking

While a number of studies explore smoking among youth and smoking prevalence among different ethnic or racial groups respectively, little effort has been made to combine these two areas by examining cigarette smoking specifically among adolescents from different ethnic backgrounds. Most research on adolescent smoking has been limited to middle-class, Anglo populations (McGraw et al., 1991). Cultural and economic contexts have generally been overlooked. Studies which include ethnicity as a variable focus on simply describing differences in smoking prevalence between various groups rather than attempting to examine how *ethnicity itself* might influence tobacco and other drug use (Adlaf et al., 1989). Few attempts have been made to examine ethnic differences in the antecedents and predictors of

youth smoking behaviour. Theoretical explanations for ethnic variations in smoking behaviour have yet to be offered (Cheung, 1990-91a). Recently, researchers have begun to explore the potential factors which may underlie the disparate rates of cigarette smoking observed among different ethnic groups.

Ethnic Differences in Correlates and Predictors of Adolescent Smoking

One possible explanation for ethnic differences in smoking prevalence may be that the predictors and correlates of teenage smoking which have been identified in the literature are not necessarily salient and/or differ in the degree of importance to adolescents across different ethnic groups (Parker, Sussman, Crippens, Scholl, & Elder, 1996). A single set of predictors may not be applicable for all ethnic groups who may differ in cultural values, beliefs and practices (Landrine, Richardson, Klonoff, & Flay, 1994). For example, one study of a culturally diverse sample of adolescents revealed that peer smoking was the best predictor of smoking among White adolescents but had less predictive power for Latino, Asian and Black youth (Landrine et al., 1994). Other studies have also found that having friends who smoke predicts smoking among White adolescents but not among their Black (Headen, Bauman, Deane, & Koch, 1991; Vega, Zimmerman, Warheit, Apospori, & Gil, 1993; Farrell, Danish, & Howard, 1992) or other minority counterparts (Klesges & Robinson, 1995). Conversely, risk-taking tendencies appear to be powerful predictors for Black adolescents, while accounting for little of the variance in smoking among White adolescents (Castro, Maddahian, Newcomb, & Bentler, 1987; Sussman, Dent, Flay, Hansen, & Johnson, 1987). A recent study demonstrated that both smoking incidence and risk factors for smoking initiation are less prevalent among African American adolescents than European Americans. For example,

African American students reported less exposure to smoking models, both parents and peers, which may be responsible for lower smoking rates (Robinson & Klesges, 1997). In another study, parental influence and academic performance were found to play a less influential role in smoking among Black youth than White youth (Botvin, Baker, Goldberg, Dusenbury, & Botvin, 1992).

Disparities in smoking rates may also be related to different attitudes, beliefs and perceptions about cigarette smoking held by various ethnic or cultural groups. For example, in comparison to European American adults, African American adults appear to have more negative views about cigarette smoking and be more likely to restrict smoking in the household by teenagers (Koepke, Flay, & Johnson, 1990; Klesges & Robinson, 1995; Parker et al., 1996). Interviews with immigrants from different ethnic backgrounds revealed distinctive patterns of norms regarding acceptability of and reasons for smoking. For example, one study found that while some ethnic groups (e.g. Chinese, Cambodian, Vietnamese) expressed distaste for smoking among women, female smoking was seen as equally acceptable to male smoking for other ethnic groups (e.g. Polish, Eastern European) (Beardall & Edwards, 1995). Moreover, socioeconomic factors may play a role in differences in the adoption of health-risk behaviours such as cigarette smoking among adolescents from different ethnic backgrounds (Lowry et al., 1996; Neumark-Sztainer et al., 1996; Williams & Rucker, 1996).

Researchers have also suggested that racial/ethnic differences in tobacco and other drug use by teenagers may be attributable, at least in part, to differences in background and lifestyle variables including parents' education level, family structure and region of residence (Wallace & Bachman, 1991). Ethnic variations in rates of smoking may also result from being

differentially exposed to known risk factors for drug use. For example, one study found that Black and Hispanic adolescents were more vulnerable to depressive mood and low self-esteem than White adolescents, which in turn may lead to initiating cigarette use. Ethnic subgroups appeared to have distinct patterning of risk factors and differential vulnerability to their effects (Vega et al., 1993). Thus, social, developmental and cultural factors may interact in unique ways to influence the health behaviours of adolescents from diverse ethnic backgrounds (Neumark-Sztainer et al., 1996). Although there is evidence to suggest that the smoking behaviour of adolescents from different ethnic backgrounds may be influenced by different risk factors and that attitudes and beliefs about cigarette smoking may vary between ethnic or cultural groups, no clear patterns have been discerned due to the scarcity of research in this area.

Acculturation and Cigarette Use

In addition to differences in the predictors or correlates of smoking between different ethnic groups, there is also evidence that inconsistencies in smoking behaviour, both between ethnic groups and within ethnic groups, may be due to the acculturation process. That is, smoking may be influenced by the extent to which adolescents, particularly those from minority ethnic backgrounds, make behavioural and cultural adaptations in response to contact with the mainstream culture. For example, one study suggested that as the degree of acculturation among Hispanic adolescents increases, the cultural protectors which once helped them to resist pressures to smoke are weakened (Markides, Coreil, & Ray, 1987). Lowered age of experimentation with tobacco among minority youth populations and increased likelihood of smoking among minority ethnic women may also be associated with higher

levels of acculturation or immersion into mainstream society (Ramirez & Gallion, 1993; McGraw et al., 1991; Ferrence, Brewster, Edwards, Joseph, & Northrup, 1996). A recent study of a Punjabi community showed that increased levels of acculturation were associated with increased lifetime use of alcohol and more liberal attitudes toward alcohol use (Weber, 1996).

Furthermore, studies have found that Hispanics who were more acculturated smoked a greater number of cigarettes per day than their less acculturated counterparts (Marin, Perez-Stable, & Marin, 1989) and that Hispanic-Latino youth who came from bi-cultural families, speaking both English and Spanish, had increased odds of being current smokers than those who came from homes where only Spanish was spoken (Dusenbury, Epstein, Botvin, & Diaz, 1994). Likewise, a study of a multi-ethnic sample of high school students showed that those using mostly English at home (high acculturation) were more likely to drink alcohol than students who mostly used a combination of English and an ethnic language (medium acculturation). Students using only an ethnic language at home, representing a low level of acculturation, were least likely to be alcohol drinkers (Cheung, 1993b). Increased smoking and alcohol use may be associated with diminished family orientation as acculturation proceeds (Balcazar, Peterson, & Cobas, 1996). Thus, changes in attitudes, norms and values of individuals exposed to a different culture appear to be important facets of the acculturation process and may in turn lead to changes in health behaviours (Lovato et al., 1994).

The Influence of Place of Birth, Generational Status & Ethnic Identification

Other dimensions of ethnicity which are closely related to the acculturation process, including place of birth, generational status and ethnic identification, have also been associated

with adolescent smoking and other drug use. For example, Canadian-born students are more likely to drink alcohol regularly than their foreign-born counterparts (Cheung, 1993b). Puerto Rican students who were born in and had lived in New York their entire lives were significantly more likely to be smokers than Puerto Rican students who were born outside of New York (Velez & Ungemack, 1995). However, with prolonged exposure to the host environment, differences in the rates of smoking between native and foreign-born Puerto Rican students dissipated. The generational status of Puerto Rican youth was found to be systematically related to differences in the occurrence of factors which put them at risk for drug use involvement. Indeed, loss of family control during the migrant experience has been identified as an important factor contributing to increased prevalence of deviant behaviour among immigrant youth populations (Velez & Ungemack, 1995).

It has been suggested that the health behaviours of immigrant teenagers likely change as they spend more time in and begin adopting practices of the host country (Brindis, Wolfe, McCarter, Ball, & Starbuck-Morales, 1995; Khoury, Warheit, Zimmerman, Vega, & Gil, 1996). A recent study of Hispanic adolescents showed that immigrant youth who lived in the U.S. for two years or less had the lowest lifetime rates of cigarette and other substance use. However, rates of lifetime use almost doubled for immigrant girls who had lived in the U.S. longer than two years (Khoury et al., 1996). Likewise, Vietnamese girls who had been in the United States for ten years or longer were much more likely to smoke than more recent immigrants (Wiecha, 1996). Adult immigrant groups also report increased consumption of cigarettes after arriving in Canada (Beardall & Edwards, 1995). Ethnic identification or the extent to which an individual feels attached to his or her ethnic group also appears to be related

to adolescent substance use. For example, students expressing stronger attachment to their ethnic group reported less alcohol use than those with less strong levels of ethnic identity (Cheung, 1993b).

Are Minority Ethnic Adolescents at Increased Risk?

In light of the fact that adolescence is a common period for initiating health-risk behaviours such as cigarette smoking and observations that rates of smoking may differ between ethnic groups, it appears crucial to examine the role that ethnicity plays in adolescent smoking behaviour. One particularly important question is whether minority ethnic teenagers may be at increased risk for engaging in cigarette smoking. Addressing this question would have important implications for the future direction of tobacco control interventions for youth in culturally diverse communities. At present, there is evidence to both support and refute the possibility that minority ethnic youth are at increased risk.

While adolescence represents a challenging developmental period for teenagers in general, the transition from childhood to adolescence may present special challenges for minority ethnic teenagers that teenagers from the majority culture do not directly encounter (Goodenow & Espin, 1993). For example, making the transition into high school may present heightened difficulties for minority teenagers by producing feelings of exclusion, rejection and inadequacy (McGraw et al., 1991; Rosenberg, 1965). Minority teenagers may experience stress and ambiguity as they discover that the cultural values and behaviours at home are not valued among majority peer groups (Phinney, Lochner, & Murphy, 1990; Hovey & King, 1996). As they are introduced to attitudes and practices which conflict with the expectations of their parents and other members of their own ethnic group, immigrant children and teenagers

may feel caught between contradictory messages (Bullrich, 1989). Engaging in health-risk behaviours such as cigarette smoking may represent a means for minority adolescents to approximate an image of the majority culture or become more “westernized”.

While changes in self-concept and sense of identity are hallmarks of development for all adolescents, the process of identity formation may be especially complicated for ethnic and racial minorities (Earls, 1993). Contrasts in cultures over appropriate sex roles can surface for minority ethnic teenagers (Goodenow & Espin, 1993). Negative health-risk behaviours such as cigarette smoking may be motivated by its ability to help minority adolescents gain entrance into and achieve social acceptance among majority peer groups. In particular, immigrant teenagers may engage in practices of the host country as a way to assimilate or blend into their new surroundings. Furthermore, cigarette smoking may be adopted as a way to cope with identity formation problems, feelings of marginality and social isolation. For some minority adolescents, substance use may be a way to deal with ethnic identity problems, discrimination and racism (Trimble, 1996). Thus, as minority and/or immigrant adolescents attempt to function in contrasting cultures, they may be at increased risk for engaging in tobacco and other drug use.

Conversely, it is also possible that teenagers from minority ethnic backgrounds may not be at risk for initiating or maintaining cigarette smoking. Minority teenagers are faced with the formidable tasks of simultaneously retaining their unique ethnic and cultural roots and negotiating a place for themselves within the dominant groups in society. But having close ties to and strong social support from the family, which is characteristic of some minority ethnic groups, may help to shield them from engaging in health-risk behaviours (Balcazar et al.,

1996). The cultural traditions and parental controls of immigrant families may provide a “buffer” and discourage minority ethnic teenagers from accepting and adopting deviant behaviours (Gonzales & Cauce, 1995). For example, one study of Hispanic youth demonstrated that family social support reduced the influence of deviant peers on tobacco use (Frauenglass, Routh, Pantin, & Mason, 1997). Furthermore, in light of the relatively low prevalence of tobacco use among adult minority populations (Millar, 1992), minority children and adolescents are more likely to be exposed to non-smoking familial and community role models, have fewer opportunities to learn to smoke, and be less likely to develop positive attitudes toward smoking. Finally, minority ethnic teenagers may have less vulnerability to tobacco use because of long-standing ethnic, cultural or religious values and practices which are incompatible with tobacco use among young people.

Due to the scarcity of research in this area, no definitive conclusions regarding whether or not minority ethnic teenagers are at risk for engaging in cigarette smoking can be made. Adolescent tobacco use, among both majority and minority populations, is a complex and dynamic behaviour which is influenced by a combination of personal, social, cultural and environmental factors. To date, the smoking behaviour of adolescents from diverse ethnic backgrounds is not well understood due to a number of methodological and conceptual challenges in this area of research.

Limitations of Current Research

Lack of Canadian Research

Studies which examine smoking among ethnic groups have a number of limitations. First, Canada is noticeably underrepresented in the literature regarding ethnicity and adolescent

smoking. Most of the studies on youth smoking and on ethnic or racial differences in smoking behaviour have originated from the United States, with strong emphasis on Hispanic and African-American populations. At present, national smoking rates conceal wide variations in smoking prevalence between ethnic groups (Millar, 1992). There has been a paucity of research directed towards culture-specific factors which influence tobacco use in groups which comprise Canada's multicultural society (Edwards & MacMillan, 1990). Clearly, the ethno-cultural make-up of Canada differs significantly from the United States. For example, the 1991 Canadian Census reports substantial representation from such diverse backgrounds as French, Chinese, Italian, East Indian, Polish, Filipino, Caribbean and many others (Statistics Canada, 1993). Given the lack of research initiatives directed toward investigating smoking prevalence or etiological factors of smoking among minority and/or immigrant populations, the influence of increasing immigration and the experience of acculturation on adolescent health and health behaviours are not well understood.

Moreover, a shift in the sources of immigrants in the past decade from European to non-European backgrounds has modified and will continue to alter Canada's ethnic and linguistic composition (Ontario Ministry of Citizenship, 1991). While the American and Canadian cultures are similar and results from studies of U. S. populations are invaluable, Canadian culture is also distinct from the U. S. in terms of issues such as immigration policy and patterns, ethnic composition, and attitudes regarding multiculturalism. Clearly, the lack of research about cultural groups in Canada hinders a clear understanding of smoking prevalence among adolescent subgroups and of the distinct reasons for why minority ethnic and majority ethnic teenagers may or may not engage in cigarette smoking.

Methodological Inconsistencies

Another major limitation of studies which examine ethnicity and smoking is the lack of uniformity or consistency among them. Studies vary widely in the samples which are chosen and the sampling techniques employed to obtain them. For example, while some studies yield nationally representative (very large) samples (e.g., Bachman et al., 1991), others use relatively small samples from specific geographic regions (e.g., Maddahian, Newcomb & Bentler, 1988). There is also considerable variation in the age range of subjects included in samples in studies focusing on adolescent smoking. For example, grade levels of subjects can range from tenth to twelfth grades (e.g., Castro, Maddahian, Newcomb & Bentler, 1987) to sixth to twelfth grade (e.g., Presson, Chassin, Sherman, Olshavsky, Bensenberg & Corty, 1984). Meanwhile, other studies sample from a single grade in several schools (e.g., Botvin et al., 1992). Samples from some studies are subjects who are a part larger scale longitudinal studies of smoking (e.g., Maddahian, Newcomb & Bentler, 1988) while other studies sample, randomly or purposively, exclusively from school populations (e.g., Elder, Molgaard & Gresham, 1988). Researchers also use disparate methods for measuring the rate or frequency of cigarette smoking, making comparisons across studies difficult.

The lack of consistency in age range, sampling procedures, measurement techniques and ethnic group representation among studies presents challenges in interpreting results and precludes making conclusions about the relationship between ethnicity and adolescent smoking. Complete descriptions of samples, including the mean age and range, the ethnic make-up and specific sampling procedures, are often nonexistent in the literature. Despite the recent accumulation of studies which point to ethnic or racial variations in cigarette smoking

and other drug use, the relationship between ethnicity and drug use, particularly in the Canadian context, remains poorly understood (Cheung, 1990-91a).

Ethnicity as a Research Variable

Although there is evidence of varied rates of drug use between members of different ethnic groups, studies which have examined ethnicity have been beset with limitations (Adlaf et al., 1989). The variable of ethnicity has not been properly conceptualized and measured in most studies of drug use (Cheung, 1990-91b). Although ethnicity is used widely as a background or sociodemographic variable to be “controlled for”, it has not been considered as a complex and multifaceted concept. Definitions of ethnicity in studies are often vague or nonexistent. Studies which examine smoking behaviour among ethnic or racial groups vary widely in number and types of ethnic groups represented. While some studies use biracial samples such as White versus Black groups (e.g., Klesges et al., 1988) or Hispanic versus non-Hispanic groups (e.g., VanOss Marin, Marin, Perez-Stable, Otero-Sabogal & Sabogal, 1990), others include wide ranging ethnic representation. For example, one study surveyed students from eight different ethnic groupings including categories such as Eastern European, Oriental and Jewish (Adlaf et al., 1989).

In addition, participants in ethnicity studies are often artificially designated into heterogeneous categories which may not necessarily reflect true ethnic differences (Edwards & MacMillan, 1990). Birthplace, ancestry and subjective descriptions have all been used, alone or in combination, as indicators of ethnicity in different studies. However, by assigning individuals to broad ethnic categories, differences among individuals *within* any particular group are often overlooked. Rather than focusing merely on intergroup differences, it may be

more important to recognize differences among members of different or the same ethnic group with respect to factors such as ethnic identification, cultural incorporation, ethnic community involvement and adaptation problems (Cheung, 1990-91b).

Evidently, there is little consistency in how the ethnicity of subjects are identified, what groups are studied and how ethnicity is defined and measured. These issues merit greater attention and planning on the part of researchers because the choice of ethnic categories and the operationalization of ethnicity have an important influence on the interpretation of study results (Edwards, 1992). Cheung (1993a) concludes that, “the lack of uniformity and sophistication in the treatment of the concept of ethnicity has made it difficult for meaningful comparisons to be made of ethnic variations found in different studies” (p. 1211). Clearly, the concept of ethnicity requires closer examination. In light of the fact that there appears to be no agreement about defining the concept of ethnicity, perhaps research would be better served by focusing on how belonging to a certain culture or ethnic group within a particular context influences how young people choose to behave rather than formulating definitions which do not capture or reflect teenagers’ social experiences.

Ethnicity: A Multidimensional Concept

The treatment of the concept of ethnicity represents a difficult challenge for studies which aim to gain a better understanding about the relationship between ethnicity and smoking. To date, researchers have not captured the full domain of the concept of ethnicity (Adlaf et al., 1989). For example, variables such as level of acculturation, immigrant status and strength of ethnic identity represent important components of ethnicity which have yet to be explored fully. Indeed, the concept of ethnicity can encompass multiple aspects or dimensions including

family structure, religious beliefs and practices, social networks and support, cultural values, ethnic traditions and so on. Furthermore, the experience of belonging to a particular ethnic group is likely mediated by other factors such as socioeconomic status, level of education and length of time spent in the host country (Lowry et al., 1996; Wallace & Bachman, 1991; Brindis et al., 1995).

Summary

Adolescent cigarette smoking is a serious public health concern. Research has shown that youth smoking is influenced by a complex interplay of demographic, personal, behavioural, social and environmental factors. As youth smoking rates continue to rise and as Canada's population becomes increasingly ethnically and culturally diverse, it appears crucial to elucidate the potential relationship between ethnicity and adolescent smoking. While results from some studies point to significant ethnic differences in rates of youth smoking, national studies have not yielded reliable data regarding these differences nor have studies examined the potential reasons and factors underlying the observed disparities. Not only are studies focused on ethnicity and adolescent health behaviours overdue, future research efforts must also aim to treat ethnicity as a complex and multidimensional concept. A greater understanding about the smoking behaviour of adolescents from various ethnic backgrounds will facilitate the development of tobacco control programs that are culturally relevant for the distinct teenage populations in this country.

The Present Study

Theoretical Framework

The choices of research variables and the hypotheses in the present study were guided by various theories and theoretical perspectives which have been developed to understand and explain adolescent health behaviour.

Social Learning Theory

Social Learning Theory (Bandura, 1977) has been one of the most influential theories to explain health behaviours. According to this theory, health behaviours such as cigarette smoking are dependent upon both the person and the environment. Particularly, certain aspects of the social environment such as family members, friends and peers guide individual behaviour and provide cues about what behaviours are acceptable and desirable and what types are unacceptable. Applied to the area of tobacco use, social learning theory suggests that peers and family members are key models who can either promote or inhibit smoking and other health risk behaviours by children and adolescents. For example, peers are often the most influential models in day-to-day learning (McAlister, 1987). Also, celebrities and other mass media figures serve as key models in shaping teenagers' behaviours. It has been suggested that by observing attractive role models who smoke, adolescents learn that smoking and other drug use are vehicles for becoming mature and sophisticated.

Teenagers also learn about smoking behaviour from parents and peers through both socialization practices, observational learning and reinforcement. For example, teenagers living with parents who smoke can learn how to smoke and acquire expectations regarding smoking

through observation and imitation (Evans, 1988; Frauenglass et al., 1997). Furthermore, as cigarette use is continued, the positive associations or pairing of smoking with feelings of reduced stress and anxiety, are strengthened and make cessation a difficult task.

Developmental Perspective

From a developmental perspective, the influence of peers becomes increasingly salient as adolescents begin to establish an identity outside of the family unit (Millstein & Igra, 1995). As teenagers broaden their social circle and place more importance on relationships with friends, acceptance into peer groups or the “popular crowd” can act as a positive reinforcement for cigarette smoking. At this age, teenagers face powerful social pressures to conform to peer group expectations (Gonzales & Cauce, 1995). In modern Western cultures, adolescents are encouraged to emancipate themselves from their parents, seek activities and social relationships outside of the family unit, and move toward adult decision-making and behaviours (Goodenow & Espin, 1993). Health risk behaviours may serve to fulfill these developmental needs and expectations. Cognitively, teenagers generally perceive themselves to be invulnerable to harm. The negative health consequences of cigarette use seem remote and irrelevant because they will not occur for a long time (Sussman, Dent, Burton, Stacy, & Flay, 1995). From a developmental perspective, the emergence of health risk behaviours such as cigarette smoking during the adolescent life stage are expected in light of the profound physiological, psychosocial and cognitive changes which characterize the teenage years (Millstein & Litt, 1990).

Problem Behaviour Theory

Another influential theory of adolescent health behaviours is Problem Behaviour Theory (Jessor & Jessor, 1977). This theory is based on the premise that problem behaviours such as cigarette smoking among adolescents are functional, purposeful and goal-oriented rather than arbitrary or pathological (Millstein & Igra, 1995). For adolescents, cigarette smoking can serve as a way to gain access to peer groups, to express solidarity with peers, to demonstrate identification with youth subcultures, to cope with anxiety and frustration, and to affirm maturity. Smoking may also be an expression of opposition to adult authority and of repudiation of conventional societal norms. Thus, Problem Behaviour Theory predicts that experimentation with and use of drugs by adolescents is difficult to abolish and unlikely to diminish. Smoking should not necessarily be viewed as a deviant behaviour but a functional behaviour which serves important personal and social functions for adolescents (Jessor, 1991).

Theory of Reasoned Action

The Theory of Reasoned Action (TRA) has also been used extensively to explain health risk behaviours and to develop interventions for substance abuse. It suggests that there is a close association between an individual's beliefs (behavioural and normative), attitudes, intentions and subsequent behaviours (Ajzen & Fishbein, 1980). According to TRA, individual behaviour can be predicted from the person's intentions toward acting out the behaviour. Furthermore, people's intentions are formed by their attitudes about performing the behaviour and their normative beliefs regarding the behaviour (Montano, Kasprzyk, & Taplin, 1997). Thus, a teenager will likely engage in cigarette smoking if he or she has positive

attitudes toward smoking and perceives smoking to be a behaviour that is accepted or esteemed by important referent individuals in their life and/or to society in general. Individual beliefs are not necessarily rational, logical or correct by some objective standard. Rather, social behaviour is driven by individuals' subjective perceptions. If smoking is perceived to be a valued and acceptable behaviour among parents or peers, it is not surprising that teenagers will smoke. According to TRA, all individuals process information from various sources and are motivated to act on it. Thus, adolescents' attitudes, beliefs and intentions about cigarette and other drug use develop as a result of many factors including their experiences with family members, friends or peers, cultural traditions and societal norms. Whether a teenager will smoke will depend on his or her subjective perceptions and experiences related to cigarette use.

Social Ecology Theory

In addition to the smoking behaviour and related attitudes of parents and peers, other contextual factors also contribute to adolescent smoking behaviour. The social world of adolescents can be understood from a social ecological paradigm (Bronfenbrenner, 1979). While microsystems (including the family and peer groups) play a central role in adolescent health behaviours, macrosystems (including cultural, economic and environmental contexts) are also key determinants of tobacco use. Factors such as socioeconomic status and ethnic group membership interact with social norms, models, opportunities and reinforcements to serve as a background for participation in risky behaviours (Millstein & Igra, 1995). Patterns of adolescent behaviours are influenced by and reflect prevailing societal ideologies and contexts. The interaction between microsystems and macrosystems sets the stage for individual developmental outcomes. For example, the combination of living in a dysfunctional

family system and impoverished conditions would place an adolescent at increased risk for engaging in health-compromising behaviours.

Acculturation Theory

One aspect or dimension of ethnicity that has been identified as a factor which may influence health behaviours such as cigarette smoking is acculturation, which refers to the process by which individuals learn about and adapt to a new culture (Lovato et al., 1994; Hovey & King, 1996). According to the Acculturation Theory or hypothesis, the experience of being exposed to and living in a new cultural environment will lead to changes in individual and group attitudes, norms and values. In turn, lifestyle choices and health related behaviours will also be modified. In the case of cigarette smoking, it is hypothesized that as minority ethnic populations acculturate to mainstream Anglo culture, rates of smoking among these groups will begin to approximate those of the host society (Deosaransingh et al., 1995; Velez & Ungemack, 1995; McGraw et al., 1991; Marin et al., 1989).

This “acculturation-smoking uptake” phenomenon is especially pronounced among minority ethnic adolescents, who are at a developmental stage when acceptance into peer groups and appearing the same as everyone else are particularly important. As a young person becomes more acculturated, peer influences may become increasingly more important than parental or family influences (Balcazar et al., 1996; Deosaransingh et al., 1995). The Acculturation Theory suggests that cultural factors which help minority ethnic adolescents resist pressures to smoke are weakened as the degree of acculturation is strengthened (Ramirez & Gallion, 1993). Minority ethnic adolescents striving for an independent identity may engage in health risk behaviours as a means to embrace a new culture. Moreover, immigrant children

and adolescents must quickly adapt to entering a new country, attending new schools, speaking a different language and being exposed to different cultural mores and practices (Bullrich, 1989). For adolescents, the incongruence between values and practices at home and those encountered in mainstream societal contexts may lead to problems in adjustment (Velez & Ungemack, 1995). Loneliness, social isolation and depression related to the immigration experience may be reasons for uptake or continuation of cigarette use (Beardall & Edwards, 1995). Consequently, the desire to fit into peer groups in a new setting, coupled with problems related to the acculturation process, increases the minority adolescents' vulnerability to tobacco and other drug use (Trimble, 1996).

Evidently, various theories or theoretical perspectives serve as a basis for understanding adolescents and their health behaviours. The theoretical perspectives which have been presented are complimentary and together point to the importance of studying the relationship between ethnicity and adolescent smoking. The present study aims to contribute to current knowledge in this area.

Objectives

The purpose of this research is to examine the relationship between ethnicity and adolescent cigarette smoking. The objectives of the present study were: 1) to determine the extent of cigarette smoking among adolescents from various ethnic backgrounds, and 2) to determine whether various dimensions of ethnicity, namely level of acculturation, immigrant status and strength of ethnic identity, along with socioeconomic status, peer smoking and parent smoking are significant predictors of adolescent smoking status.

Hypotheses

The hypotheses of the present study were as follows:

Central Hypotheses

1. Based upon the patterns of smoking observed among Canadian adults, there will be a significant difference in smoking status among students from different ethnic groups; students who report an Anglo ethnic background (British, English, Scottish, Irish or French) will be more likely to be current smokers than students reporting any other ethnic backgrounds.
2. The dimensions of ethnicity (namely, strength of ethnic identity, level of acculturation and immigrant status), along with socioeconomic status (SES), peer smoking and parent smoking will be significant predictors of students' smoking behaviour.

Secondary Hypotheses

3. Students who report a lower SES will be more likely to be smokers than students who report a higher SES.

4. Students with stronger ethnic identity will be less likely to be smokers than students with weaker ethnic identity.
5. Canadian-born students will be more likely to smoke than Foreign-born students.
6. Students who show a higher level of acculturation will be more likely to be smokers than students who show a low level of acculturation.
7. Students whose friends smoke will be more likely to smoke than students whose friends do not smoke.
8. Students whose parent(s) smoke will be more likely to smoke than students whose parents(s) do not smoke.

Method

Sample

The target population in the present study was students attending Grade 11 in public secondary schools in the Toronto Board of Education and the sampling frame was lists of Grade 11 home room classes. Adult learning centers and alternative schools were not included. In accordance with instructions from the Toronto Board of Education Research Review Committee, six secondary schools from a list of all Toronto secondary schools with a Grade 11 population of 150 or greater were asked to participate in the present study. Three schools were randomly selected, by using a random number table, from two geographical regions of the city, North-East and West-Central, respectively. Five of the six principals of the originally selected schools agreed to participate in the study and one principal of a North-East school refused to participate. Subsequently, another school from that region was randomly selected and that principal agreed to take part (see Appendix A). All students in Grade 11 homeroom classes of the selected schools were surveyed. Grade 11 students were chosen for the present study because this group has the highest rates of cigarette smoking among secondary school students. Approximately 42% of Grade 11 students in Ontario reported smoking cigarettes during the last 12 months (Adlaf et al., 1995).

Each of the six schools represented a randomly selected cluster. It was assumed that the populations in the clusters (i.e., Grade 11 classes) would not differ from each other nor with other schools in this school board with respect to the smoking or other research variables. Probability sampling was not used because of the exploratory nature of the study and because the focus was to examine associations between smoking and other variables rather than to

predict epidemiological risk. Random selection helped to enhance the external validity of the results. Stratifying the city into two regions ensured equal representation from all areas of the city.

In order to estimate the approximate size of sample needed, other school-based studies were examined and a power analysis was performed. Other school-based drug use surveys in the literature undertaken in one city have average sample sizes of approximately 700. For a regional study, a sample of about 700 is suitable (Sudman, 1983). A small effect size was expected in the present study because studies in the literature have generally yielded small effects, with predictors accounting for small amounts of variance in smoking outcome. The sample must be large enough to detect an existing effect and to minimize chance error. According to Cohen's (1992) power analysis, a sample size of 726 is required in a multiple regression model with seven predictors, at the .05 significance level.

In the six participating schools, there were 1730 eligible students in 81 Grade 11 homerooms. However, 21 of 81 (25.9%) of the homeroom teachers refused to participate or did not respond to communication attempts, leaving 1385 students (80.1%) of eligible students from whom active parental consent was sought. Of these, consent was refused for only 20 (1.4%); however, 836 (60.3%) did not return the parental consent form. Consequently, active consent was received from 529 students, representing 38.2% of those from whom consent was sought, and 30.1% of all eligible Grade 11 students. Of the 529 students with active parental consent, 445 (84.1%) took part in the survey, and 427 (80.7%) provided complete and usable surveys. Appendices B and C summarize these data.

The majority of school-based studies of substance use employ passive consent procedures for obtaining parental permission which is known to yield high participation levels. However, in accordance with the Toronto School Board's policies, active consent procedures were employed in the present study. One Canadian longitudinal study which also used active consent yielded parent consent from 43.1% of eligible students (Pederson, Koval, & O'Connor, 1997). Similarly, another classroom survey using active consent yielded a consent rate of 66.5% (Vega et al., 1993). Thus, the relatively low return rates in the present study were not unexpected.

Procedure

The present study employed a cross-sectional survey method. Prior to data collection, formal permission to enter schools was obtained from the Toronto Board of Education Research Review Committee. Principals of each sampled school were informed about the study by the Research Manager of the school board and were asked for their permission to conduct the survey at their respective schools. Once permission was secured, lists of Grade 11 homerooms were obtained from each school. Grade 11 homeroom teachers were notified by principals about the study. Each Grade 11 homeroom teacher was provided with letters informing parents about the present study and parent consent forms (Appendix D) to distribute to students in their classes. Teachers were also instructed to collect parent consent forms as they were returned by the students.

Approximately two weeks after letters and parent consent forms were sent home with students, classes were surveyed during a homeroom period. Only students with signed consent forms from parents or guardians and/or those who were 18 years old and older were allowed

to take part in the survey process. Prior to completing the questionnaires, students also signed a student consent form (Appendix E). The self-report questionnaires (Appendix F), which took approximately 10 to 15 minutes to complete, were distributed and collected by the homeroom teachers. Once the questionnaires were completed, students were given a debriefing letter (Appendix G) by the teacher which explained the nature of the study and thanked them for their participation. The survey took place between the months of April and June of 1997.

Instrumentation

The self-report questionnaire (Appendix F) begins with questions about the student's age, sex and grade in school. The format of these questions are the same as the questions used in the Ontario Student Drug Use Survey (OSDUS) (Adlaf et al., 1995) and have been shown to be both valid and reliable. The other research variables were defined and measured as follows:

1. Strength of Ethnic Identity: Ethnic identification refers to the extent to which an individual feels attachment to a group on the basis of ethnic origin (Cheung, 1993b). The Multigroup Ethnic Identity Measure (MEIM) (see questions 4 to 24) is a 20-item self-report scale which measures strength of identification with the individual's own ethnic group and with other ethnic groups. Phinney (1992) reported Cronbach's alphas of .81 and .90 for the Strength of Ethnic Identity Subscale among ethnically diverse high school and college samples, respectively. Respondents are asked to write down the name of the ethnic group they consider themselves as being part of and then rate items along a 4-point scale ranging from strongly agree to strongly disagree. Examples of items include "I have a strong sense of belonging to my own ethnic group" and "I feel a strong attachment towards my own ethnic group". In

cases where multiple ethnic groups were identified by participants, the first ethnic group identified was used to define the student's ethnic group membership.

Mean scores for the Strength of Ethnic Identity Subscale were calculated for each participant by summing scores of the 14 items (items 5, 6, 7, 9, 10, 12 reversed, 14 reversed, 15, 16, 17, 18, 20, 22 and 24) and dividing by 14, with the lowest possible mean score being 0, representing weak ethnic identity, and the highest possible mean score being 3, representing strong ethnic identity. The original instructions were modified slightly in order to better suit Canadian students.

2. Level of Acculturation: Acculturation is defined as a process of change among individuals or groups as a result of contact between different cultures (Gonzales & Cauce, 1995; Hovey & King, 1996). Two language-use questions and one question about the ethnic background of students' friends (questions 25-27) were used as a proxy measure of level of acculturation. There are no known standard scales to measure this construct for an ethnically diverse sample. Language-use has frequently been employed as a measure of level of acculturation in other studies (e.g., Bettes, Dusenbury, Kerner, James-Ortiz & Botvin, 1990; Deosaransingh et al., 1995; Landrine et al., 1994). A level of acculturation score was generated for each participant by summing scores of the two language-use questions (language use with parents and language use with friends), with the lowest possible score being 0, representing low acculturation, and the highest possible score being 4, representing high acculturation. For statistical analyses, students with scores between 0 and 2 were classified as having a low level of acculturation and students with scores between 3 and 4 were classified as having a high level of acculturation.

3. Immigrant Status: Immigrant status, another dimension of ethnicity, was measured by a question (questions 28) about students' place of birth. Those students who indicated that they were born in Canada were coded as Canadian-born while those students who indicated that they were not born in Canada were coded as Foreign-born. This question is modeled after the place of birth question used in the Every Secondary Student's Survey (Cheng et al., 1996).

4. Generational Status: Generational status was measured by two items (questions 31 and 32) which asked about parents' place of birth. In cases where neither parent was born in Canada, students were coded as first generation. Those students reporting that at least one parent was born in Canada were coded as second or higher generation.

5. Socioeconomic Status (SES): SES was measured by two items (question 33-34) asking students to report which parent(s) they live with and their parents' highest level of education. These items are similar to those used in the Every Secondary Student Survey to measure SES. Parent education level has been shown to be a non-threatening and valid measure of SES and is a widely used indicator of SES (Lowry et al., 1996). In cases where the student was living with only one parent or guardian, the highest level of education of that parent or guardian was used to indicate SES. In cases where students reported that their two parents had different levels of education, the highest level indicated was used.

6. Smoking Status: The dependent variable of smoking status was measured by one item (question 35) asking students to report their smoking behaviour in the past 12 months. This question is identical to the question which assesses smoking in the Ontario Student Drug Use Survey (Adlaf et al., 1995). Based on self-reported smoking behaviour, students were classified as a non-smoker if they had not smoked a cigarette in the last 12 months and as a

smoker if they indicated smoking a cigarette or more per day in the last 12 months. These definitions are consistent with those used in the OSDUS (Adlaf, 1997).

7. Intention to Smoke: Students' intention to smoke was measured by one item (question 36) asking them to indicate the likelihood that they would smoke one or more cigarettes in the next 12 months.

8. Perceived Acceptability of Smoking: Perceived acceptability of smoking was measured by two items (questions 37-38) asking students to rate their level of agreement with statements regarding the acceptability of smoking among people in their own ethnic group and among people in Canada (ranging from strongly agree to strongly disagree).

9. Friends' Smoking: Friends' smoking was measured by one item (question 39) asking students to estimate the proportion of their friends who smoke at least one cigarette per week (Cheung, 1993a).

10. Parent Smoking: Parent smoking was measured by one item (question 40) asking students whether at least one parent or guardian in their household smokes cigarettes.

Ethical Considerations

It was not anticipated that participants would experience any physical, mental or emotional harm. Both the University of Toronto Ethics Review Committee and the Toronto Board of Education Research Review Committee have strict ethical standards which were adhered to in the present study. Furthermore, informed active consent was secured from both parents and students (see Appendix D and E). An advantage of administering the questionnaire in the classroom setting was that homeroom teachers were present to ensure that students were not disturbed in any way. Students were informed that their responses were completely

confidential, that participation was voluntary and that they could withdraw their participation from the study at any time. Furthermore, students did not put their names on the questionnaires and were informed that teachers and parents would not see the completed questionnaires. Because ethnicity, socioeconomic status and smoking behaviour are potentially sensitive issues for teenagers, the survey questions were carefully designed to be as non-threatening as possible and efforts were made to keep the length of the questionnaire as short as possible.

The questionnaire was previously pilot tested on five Grade 11 students (not from the same school board) who reported that the questions were easy to comprehend and non-threatening. By giving the same questionnaire to all the students in sampled classes as a class exercise, individual students were not singled out based on ethnic group membership or any other reason. Letters were also sent to school principals and homeroom teachers after the data collection process to thank them for their support and assistance. Upon completion of the study, a comprehensive research report will be submitted to the Toronto Board of Education Research Review Committee.

Results

Descriptive Statistics

The mean age of the 427 students in the present sample was 16.64 years ($SD = .71$). Sixty percent ($n = 256$) were males and 40% ($n = 171$) were females. Table 1 shows the grade and school distributions of the sample, respectively. The majority of students were in Grade 11. Students who were not in Grade 11 but were in Grade 11 homerooms were also surveyed. As such, some Grade 10, 12 and 13 students were also included in this sample. Students' self-report of ethnic group membership revealed widely diverse backgrounds. Over 64 different ethnic backgrounds were named by students (see Appendix H). Based on self-reported ethnic background, students were grouped into the following broad ethnic categories: Anglo, Asian, European, African, Central & South American, Caribbean, Middle Eastern and Other. These categories were consistent with those established by the Toronto Board of Education in the Every Secondary Student Survey and were representative of the ethnic categories of adolescents living in Toronto (Cheng et al., 1996). The criteria for categorizing students are outlined in Appendix I. Due to the relatively small number of participants belonging to the African ($n = 22$), Central & South American ($n = 16$), Caribbean ($n = 36$), Middle Eastern ($n = 6$) or Other ($n = 14$) categories, these students were aggregated into a single category named Other. Thus, 22.2% of students ($n = 95$) belonged to the Anglo group, 27.4% ($n = 117$) belonged to the Asian group, 28.3% ($n = 121$) belonged to the European group, and 22.0% ($n = 94$) made up the Other group. Table 2 illustrates the ethnic distribution of this sample of students. The ethnic distributions of students closely resembled the ethnic distributions of the respective school populations.

Table 1. Distribution of Students by School and Grade (N = 427).

School	Grade				Total (n)
	Grade 10	Grade 11	Grade 12	Grade 13	
School 1	0% (n = 0)	86.5% (n = 11)	13.5% (n = 5)	0% (n = 0)	37
School 2	6.0% (n = 3)	82.0% (n = 41)	12.0% (n = 6)	0% (n = 0)	50
School 3	1.9% (n = 1)	86.5% (n = 45)	9.6% (n = 5)	1.9% (n = 1)	52
School 4	2.4% (n = 4)	80.4% (n = 135)	14.9% (n = 25)	2.4% (n = 4)	168
School 5	7.2% (n = 5)	68.1% (n = 47)	23.2% (n = 16)	1.4% (n = 1)	69
School 6	11.8% (n = 6)	76.5% (n = 39)	7.8% (n = 4)	3.9% (n = 2)	51
Total (n)	19	339	61	8	N = 427

Table 2. Distribution of Students by Ethnic Group (N = 427).

Broad Ethnic Group	Percent
Anglo	22.2 (n = 95)
Asian	27.4 (n = 117)
European	28.3 (n = 121)
Other*	22.0 (n = 94)

* this category is an aggregate of African (5.2%, n = 22), Central & South American (3.7%, n = 16), Caribbean (8.4%, n = 36), Middle Eastern (1.4%, n = 6) and Other (3.3%, n = 14) students.

Among all of the students, 57.4% ($n = 245$) were Canadian-born and 42.6% ($n = 182$) were Foreign-born (i.e., born outside of Canada). This is virtually identical to figures from the Toronto Board of Education's Every Secondary School Survey which showed that 43% of students were born outside of Canada (Cheng et al., 1996). Furthermore, 69.1% ($n = 295$) of students were first generation Canadians and 30.7% ($n = 131$) belonged to the second or higher generation. Table 3 illustrates the distribution of socioeconomic status (SES) among students. Parents' highest level of education was used as a proxy measure of SES. The mean score on the Strength of Ethnic Identity Subscale of the Multigroup Ethnic Identity Measure (MEIM) was 3.01 ($SD = .53$) and the Cronbach's alpha reliability was .87. Scores on this subscale for the present sample closely paralleled those from another multi-ethnic high school sample. Phinney (1992) reported a mean of 2.94 ($SD = .50$) and an alpha of .81. Based on language use with parents and friends, students were classified as having a high or low level of acculturation. Sixty-two percent of all students were highly acculturated while 38.26% had a low level of acculturation.

In the present sample, 35.4% of students reported having smoked cigarettes in the past twelve months. As shown in Figure 1, this rate is very consistent with the results from the 1995 Ontario Student Drug Use Survey which showed that 34.7% of Metro Toronto Grade 11 students were current smokers (Adlaf, 1997). Compared to results from the 1994 Youth Smoking Survey, which reported that approximately 24% of adolescents between the ages of 15 and 19 years were smokers, the rate of smoking in the present sample was slightly higher. However, it should be noted that a different question was used in the national survey to measure smoking behaviour. In the Youth Smoking Survey, current smokers were defined as

Table 3. Distribution of Students by Socioeconomic Status (SES) (N = 427).

SES*	Percent
elementary school	6.3 (n = 27)
secondary school	19.9 (n = 85)
community college	15.7 (n = 67)
university	41.9 (n = 179)
i don't know	15.9 (n = 68)
missing	0.2 (n = 1)
Total	N = 427

* SES was measured by students' reports of highest level of parental education.

Figure 1. Comparing Smoking Rates of Grade 11 Students

note: the unpublished data of Metro Toronto students from the OSDUS 1995 was obtained from Dr. Adlaf through personal communication

those who have smoked at least 100 cigarettes in their lifetime and had smoked during the 30 days preceding the survey and non-smokers were defined as those who had smoked fewer than 100 cigarettes in their lifetime (Health Canada, 1996). Tables 4 and 5 illustrate the smoking status and the frequency of smoking in the present sample of students, respectively.

Among students, cigarette smoking was generally perceived as an acceptable behaviour. Twenty-nine percent of all students reported that smoking is a somewhat or very unacceptable behaviour in Canada whereas 69.1% reported that smoking is somewhat or very acceptable. Sixty-six percent of students reported that their parents did not smoke cigarettes while 33.7% reported that at least one parent or guardian in the household smoked one or more cigarettes per week. The majority of students reported that their friends smoke cigarettes. For example, 59.6% reported that one-quarter or more of their friends smoked one or more cigarettes per week. Only 17.4% responded that none of their friends smoke.

Bivariate Analyses

Pearson chi-square analyses were conducted in order to examine the bivariate relationships between smoking status of students and other variables. The data indicated that cigarette smoking was significantly associated to a number of the predictor variables recorded in this study. As hypothesized, smoking status (smoker versus non-smoker) differed significantly between ethnic groups, $\chi^2 (3, N = 427) = 22.86, p < .001$. Figure 2 shows that students reporting an Anglo ethnic background were most likely to be smokers (46.32%), followed by students reporting European (43.80%), Other (34.04%) and Asian (18.80%) backgrounds. There was also a significant positive relationship between smoking status and

Table 4. Smoking Status of Students (N = 427).

Smoking Status*	Percent
non-smoker	64.6 (n = 276)
smoker	35.4 (n = 151)
Total	N = 427

* smokers are defined as those students reported having used cigarettes in the past 12 months.

Table 5. Smoking Pattern of Students (N = 427).

Smoking Pattern	Percent
I have never smoked cigarettes in my lifetime	45.0 (n = 192)
I have smoked cigarettes but not in the last 12 months	10.5 (n = 45)
I tried one cigarette in the last 12 months	9.1 (n = 39)
I had less than 1 cigarette a day in the last 12 months	8.2 (n = 35)
I had 1 or 2 cigarettes a day in the last 12 months	3.7 (n = 16)
I had 3 to 5 cigarettes a day in the last 12 months	6.1 (n = 26)
I had 6 to 10 cigarettes a day in the last 12 months	7.7 (n = 33)
I had 11 to 15 cigarettes a day in the last 12 months	4.2 (n = 18)
I had 16 to 20 cigarettes a day in the last 12 months	1.6 (n = 7)
I had more than 20 cigarettes a day in the last 12 months	3.7 (n = 16)
Total	N = 427

Figure 2. Smoking Status by Ethnic Group (N=427)

age, $\chi^2 (3, N = 427) = 12.74, p < .01$. As age increased, the likelihood of being a smoker also increased (see Figure 3). For example, 11% of 15 year olds were smokers compared to 46.15% of 18 year olds. In the present sample, smoking status did not differ between male and female students. However, smoking behaviour varied significantly between the schools that were sampled in this study, $\chi^2 (5, N = 427) = 28.33, p < .001$. For example, 55.07% of students from School 4 were smokers compared to only 16.22% of students from School 1 (see Table 6).

As expected, there was a significant association between smoking status and place of birth, $\chi^2 (1, N = 427) = 26.95, p < .001$. As shown in Figure 4, Canadian-born students were more likely to be smokers (45.71%) than foreign-born students (21.43%). Furthermore, students belonging to the second or higher generation were more likely to be smokers (46.56%) than first generation students (30.51%), $\chi^2 (1, N = 426) = 10.22, p < .01$ (see Figure 5). In terms of the relationship between acculturation and smoking, the results were congruent with the hypothesis that students with higher levels of acculturation would be more likely to be current smokers than those with low acculturation, $\chi^2 (1, N = 427) = 24.26, p < .001$ (see Figure 6). Finally, as expected, students with stronger ethnic identity were less likely to be current smokers than those with weaker ethnic identity, $r_{pb} = -.16 (N = 414), p = .001$.

In the present sample, there was no significant association between students' smoking status and parents' smoking status. However, smoking status was significantly related to friends' smoking behaviour, $\chi^2 (3, N = 418) = 128.67, p < .001$. As shown in Table 7 and Figure 7, the likelihood of being a smoker increased systematically as a function of the proportion of friends who smoke. For example, students who reported that none of their

Figure 3. Smoking Status as a Function of Age (N = 427)

Table 6. Smoking Status by School (N = 427).

School	Percent		Total
	Smoker	Non-Smoker	
1	16.2 (n = 6)	83.78 (n = 31)	n = 37
2	18.0 (n = 9)	82.0 (n = 41)	n = 50
3	48.1 (n = 25)	51.9 (n = 27)	n = 52
4	33.3 (n = 56)	66.7 (n = 112)	n = 168
5	55.1 (n = 38)	44.9 (n = 31)	n = 69
6	33.3 (n = 17)	66.7 (n = 34)	n = 51
Total	n = 151	n = 276	N = 427

* smoking status differed significantly between schools, χ^2 (5, N = 427) = 28.33, $p < .0001$.

Figure 4. Smoking Status and Place of Birth (N = 427)

Figure 5. Smoking Status and Generational Status (N = 426)

Figure 6. Smoking Status and Level of Acculturation (N = 427)

note: Language use with parents and friends was the proxy measure for level of acculturation

Table 7. Smoking Status and Proportion of Friends Who Smoke (N = 426).

Proportion of Friends Who Smoke	Percent	
	Smoker	Non-Smoker
none	9.5 (n = 7)	90.5 (n = 67)
less than one-quarter of them	7.1 (n = 7)	92.9 (n = 91)
about one-quarter of them	32.8 (n = 19)	67.2 (n = 39)
about one-half of them	42.9 (n = 30)	57.1 (n = 40)
about three-quarters of them	59.7 (n = 37)	40.3 (n = 25)
all or most of them	79.7 (n = 51)	20.3 (n = 13)
Total	n = 151	n = 275

Figure 7. Smoking Status as a Function of Proportion of Friends Who Smoke (N = 426)

friends smoked one or more cigarettes per week were least likely to be smokers (9.5%) while students who reported that all or most of their friends smoked were most likely to be smokers (79.7%).

Two findings in this study were of particular interest. First, socioeconomic status (SES), as measured by highest parent education level (see Measures section for detailed definition), was significantly related to student smoking status. However, it was found that students belonging to higher SES families (e.g. parents had higher levels of education) were more likely to be smokers than those students belonging to lower SES families (e.g. parents had lower levels of education), $\chi^2 (3, N = 358) = 8.93, p < .05$. As depicted in Figure 8, students with university-educated parent(s) were more likely to be smokers (45.25%) than students with parent(s) whose highest level of education was elementary school (22.22%). This finding was not expected.

In the present sample, students reporting lower SES backgrounds were concentrated in minority ethnic groups (i.e., all non-Anglo ethnic groups), $\chi^2 (12, N = 426) = 68.06, p < .001$. Furthermore, both level of SES ($\chi^2 (20, N = 426) = 129.45, p < .001$) and ethnic group distribution ($\chi^2 (15, N = 427) = 193.44, p < .001$) differed significantly between schools. For example, 61.7% of Anglo students reported that their parents' highest level of education was university compared to 22.2% of Asian students. Meanwhile, 71% of students in School 5 reported that their parents' highest level of education was university compared to 20.2% of students in School 4. It appears that minority ethnic groups tended to report lower SES and were concentrated among particular schools while Anglo students generally reported higher

Figure 8. Smoking Status as a Function of SES (N = 358)

note: parent education level was the proxy measure for SES;
69 students did not respond to this question

SES and were concentrated among other schools. Smoking status differed significantly as a function of school, broad ethnic group and SES. Table 8 summarizes these data.

Second, perceived acceptability of smoking differed significantly both between smokers and non-smokers, $\chi^2 (3, N = 418) = 13.74, p < .01$, and also between ethnic groups, $\chi^2 (9, N = 418) = 36.82, p < .001$. Interestingly, however, a greater proportion of non-smokers reported that smoking was somewhat or very acceptable (74.63%) than smokers (63.33%). In terms of ethnic group, the highest proportion of students responding that smoking was somewhat or very acceptable belonged in the Other group (80.5%), followed by Asians (74.8%), Other Europeans (66.4%) and Anglos (60.9%). Figure 9 illustrates this distribution.

Several subgroup analyses were also of interest. Among minority ethnic students (all students reporting non-Anglo ethnic backgrounds), smoking status was significantly related to both place of birth and generational status. Figures 10 and 11 illustrate that Canadian-born minority ethnic students were more likely to be smokers than foreign-born minority ethnic students, $\chi^2 (1, N = 318) = 22.18, p < .001$, and minority ethnic students belonging to the second or higher generation were more likely to smoke than first generation students, $\chi^2 (1, N = 317) = 9.09, p < .01$, respectively. Separate chi-square tests indicated that smoking status was positively associated to friends' smoking within each ethnic group (Anglo: $\chi^2 (5, N = 95) = 28.74, p < .001$; Asian: $\chi^2 (5, N = 117) = 37.82, p < .001$; European: $\chi^2 (5, N = 121) = 21.33, p < .001$; Other: $\chi^2 (5, N = 93) = 48.82, p < .001$). The results showed that within each broad ethnic group, having friends who smoke significantly increases the likelihood that an adolescent will be a smoker.

Table 8. Differences in Ethnic Distribution, SES and Smoking Status among Schools.

Ethnic Distribution					SES*				Smoking Status		
Anglo	Asian	European	Other	Elementary School	Secondary School	Community College	University	I Don't Know	Smoker	Non-Smoker	
School 1	8.1% (n = 3)	67.6% (n = 25)	10.8% (n = 4)	13.5% (n = 5)	2.7% (n = 1)	21.6% (n = 8)	18.9% (n = 7)	43.2% (n = 16)	13.5% (n = 5)	16.2% (n = 6)	83.8% (n = 31)
School 2	8.0% (n = 4)	76.0% (n = 38)	12.0% (n = 6)	4.0% (n = 2)	6.0% (n = 3)	40.0% (n = 20)	8.0% (n = 4)	22.0% (n = 11)	24.0% (n = 12)	18.0% (n = 9)	82.0% (n = 41)
School 3	59.6% (n = 31)	5.8% (n = 3)	17.3% (n = 9)	17.2% (n = 9)	1.9% (n = 1)	7.7% (n = 4)	17.3% (n = 9)	69.2% (n = 36)	1.9% (n = 1)	48.1% (n = 25)	51.9% (n = 27)
School 4	10.7% (n = 18)	26.8% (n = 45)	31.0% (n = 52)	31.6% (n = 53)	13.1% (n = 22)	20.2% (n = 34)	19.0% (n = 32)	20.2% (n = 34)	27.4% (n = 46)	33.3% (n = 56)	66.7% (n = 112)
School 5	34.8% (n = 24)	5.8% (n = 4)	33.3% (n = 23)	25.9% (n = 18)	0% (n = 0)	15.9% (n = 11)	11.6% (n = 8)	71.0% (n = 49)	1.4% (n = 1)	55.1% (n = 38)	44.9% (n = 31)
School 6	29.4% (n = 15)	3.9% (n = 2)	52.9% (n = 27)	13.7% (n = 7)	0% (n = 0)	15.7% (n = 8)	13.7% (n = 7)	64.7% (n = 33)	5.9% (n = 3)	33.3% (n = 17)	66.7% (n = 34)

* parents' highest level of education was the proxy measure for SES.

note: ethnic distribution differed significantly between schools, $\chi^2 (15, N = 427) = 193.44, p < .001$; SES differed significantly between schools, $\chi^2 (20, N = 426) = 129.45, p < .001$; Smoking status differed significantly between schools, $\chi^2 (5, N = 427) = 28.33, p < .001$.

Figure 9. Perceived Acceptability of Smoking by Ethnic Group

**Figure 10. Minority Ethnic Students: Smoking Status
and Place of Birth (N = 318)**

note: minority ethnic groups consist of all students who are not Anglo

Figure 11. Minority Ethnic Students: Smoking Status and Generational Status (N = 317)

note: minority ethnic groups are all groups which are not Anglo

While no significant gender difference in smoking was observed in the entire multi-ethnic sample, smoking status differed significantly between males and females in one ethnic group. Among Asian adolescents, males (26.2%) were significantly more likely to be smokers than females (10.7%), $\chi^2 (1, N = 117) = 4.60, p < .05$. In fact, among Asian adolescents who were born outside of Canada, only 5.1% of females reported using cigarettes in the past 12 months compared to 22.9% of males, $\chi^2 (1, N = 87) = 5.36, p < .05$.

Multivariate Analyses

The second objective of the present study was to determine whether various dimensions of ethnicity, namely level of acculturation, immigrant status and strength of ethnic identity, along with socioeconomic status, peer smoking and parent smoking are significant predictors of adolescent smoking status. To meet this objective, the following predictor variables were entered in a hierarchical logistic regression analysis to predict smoking status: Block 1- school, age, gender and SES, Block 2- broad ethnic group membership, strength of ethnic identity and place of birth, Block 3- friends' smoking and parent smoking. Block 1 represents the background or control variables, Block 2 represents the dimensions of ethnicity and Block 3 represents the social influence variables. It should be noted that level of acculturation was not included as a dimension of ethnicity in the logistic regression model as originally planned because it correlated highly with place of birth, ϕ coefficient = .52, ($N = 427$), $p < .001$. The significant association between these variables suggested that these two constructs were multicollinear and may have been essentially measuring the same acculturation dimension. Given that language use has yet to be proven as a valid and reliable measure of

acculturation, place of birth was used as a proxy for level acculturation in the multivariate analysis instead.

Logistic regression was the appropriate statistical procedure for the present model which attempted to predict a dichotomous dependent variable using both continuous and categorical predictor variables (Norman & Streiner, 1994). With this method, the effect of each predictor variable is identified after controlling for the effect of all other variables (McGee & Stanton, 1993). Table 9 shows the logistic coefficients, odds ratios and confidence intervals for this logistic regression model.

The logistic regression revealed several factors to be independently and significantly predictive of smoking status. Among the background variables, age was a significant predictor of smoking status such that older students had increased odds of being smokers (OR = 2.16; 95% C.I. 1.41, 3.30). With regard to socioeconomic status, it was found that contrary to the original hypothesis, students who come from higher SES backgrounds were more likely to be smokers. For example, compared to students with parents' whose highest level of education was elementary school, students with university-educated parents were 10 times more likely to be smokers (95% C.I. 2.65, 38.08). Strength of ethnic identity and place of birth were the dimensions of ethnicity which emerged as significant predictors of smoking status in this multivariate model. As hypothesized, students with a stronger sense of ethnic identity were less likely to be smokers than those with weaker ethnic identity (OR = .45; 95% C. I. .26, .79). Furthermore, Canadian-born students were more likely to be smokers than foreign-born students (OR = .44, 95% C.I. .22, .87). When the other predictor variables in the model were accounted for, ethnic group membership was not a significant predictor of smoking status.

Finally, the social influence variable found to be predictive of smoking status was friends' smoking. In fact, the likelihood of a student being a smoker increased as the proportion of friends who smoke increased. Compared to students who reported that none of their friends smoke cigarettes, students with less than one quarter of friends who smoke were .54 more likely to be smokers (95% C.I. .16, 1.75), students with about one quarter of friends who smoke were 3 times more likely to be smokers (95% C.I. 1.13, 9.90), students with about one half of friends who smoke were 7 times more likely to be smokers (95% C.I. 2.57, 19.81), students with about three quarters of friends who are smokers were 12 times more likely to be smokers (95% C.I. 4.13, 35.22), and students who reported that all or most of their friends are smokers were almost 33 times more likely to be smokers (95% C.I. 10.54, 101.37). The logistic regression analysis indicated that parents' smoking was not a significant predictor of adolescent smoking status for the present sample. The Hosmer & Lemeshow goodness-of-fit statistic showed that the observed values did not differ significantly from those predicted by the model (see Table 9).

Table 9. Hierarchical Logistic Regression Analysis of Predictors of Smoking Status^a (N = 411).

Predictor	β	S.E. (β)	Odds Ratio	95% Confidence Interval
Block 1: Background Variables				
School				
school 1 ^b	-	-	1.00	-
school 2	.49	.79	1.63	(.34, 7.61)
school 3	-.07	.81	.93	(.19, 4.56)
school 4	.35	.72	1.42	(.34, 5.79)
school 5	.25	.76	1.29	(.29, 5.67)
school 6	.16	.78	1.17	(.25, 5.40)
Age	.77	.22	2.16***	(1.41, 3.30)
Sex				
female ^b	-	-	1.00	-
male	-.10	.30	.90	(.50, 1.63)
SES				
elementary school ^b	-	-	1.00	-
secondary school	1.27	.66	3.54**	(.97, 12.93)
community college	1.71	.71	5.51	(1.38, 21.93)
university	2.30	.68	10.04	(2.65, 38.08)
i don't know	.50	.70	1.65	(.42, 6.47)
Block 2: Dimensions of Ethnicity				
Broad Ethnic Group				
Anglo ^b	-	-	1.00	-
Asian	.30	.53	1.34	(.48, 3.79)
European	.59	.39	1.81	(.85, 3.87)
Other	.64	.46	1.89	(.77, 4.64)
Strength of Ethnic Identity	-.79	.28	.45**	(.26, .79)
Place of Birth				
Canada ^b	-	-	1.00	-
other	-.83	.35	.44*	(.22, .87)
Block 3: Social Influences				
Friends' Smoking				
none ^b	-	-	1.00	-
less than 1/4 of them	-.62	.60	.54***	(.16, 1.75)
about 1/4 of them	1.21	.55	3.34	(1.13, 9.90)
about 1/2 of them	1.97	.52	7.14	(2.57, 19.81)
about 3/4 of them	2.49	.58	12.06	(4.13, 35.22)
all of most of them	3.49	.58	32.69	(10.54, 101.37)
Parents' Smoking				
yes ^b	-	-	1.00	-
no	-.18	.31	.84	(.46, 1.52)

^a -2 Log likelihood: $\chi^2 = 346.198$, $df = 22$, $p < .001$. Hosmer & Lemeshow Goodness of Fit: $\chi^2 = 5.946$, $df = 8$, $p = .653$. ^b reference category.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Discussion

Descriptive Findings

This study represents one of the first efforts to explore the relationship between ethnicity and adolescent cigarette smoking in Canada. Among the present multi-ethnic sample of students, smoking status differed significantly between ethnic groups. Specifically, the results indicated that students from an Anglo ethnic background were more likely to be smokers, followed by European, Other and Asian students. This pattern of ethnic differences in smoking behaviour is consistent with those observed in previous studies, which reveal a general trend for increased likelihood of smoking among Anglo populations compared to minority ethnic populations (Adlaf et al., 1989; Millar, 1992; Rogers & Crank, 1988; Bachman et al., 1991). Overall, over one third of the present sample of students reported cigarette use in the past twelve months indicating that cigarette smoking remains quite prevalent among adolescents. Moreover, the vast majority of students, both smokers and non-smokers, reported that smoking is a somewhat or very acceptable behaviour. Thus, it appears that smoking continues to be perceived by adolescents as a valued behaviour.

Dimensions of Ethnicity and Cigarette Smoking

The bivariate analyses supported many of the original hypotheses regarding the relationships between adolescent smoking, various dimensions of ethnicity and other research variables. With respect to the dimensions of ethnicity, smoking status was independently related to level of acculturation, place of birth and strength of ethnic identity. The finding that the more acculturated students are more likely to be a smoker supports the Acculturation Theory or hypothesis, which suggests that as individuals acculturate into a new setting they

will undergo lifestyle changes that mimic the patterns of behaviour of the host society (Castro, Coe, Guiterres, & Saenz, 1996; Dusenbury et al., 1994; Marin et al., 1989). It appears that as minority adolescents become increasingly immersed into the majority society, their smoking rates may begin to approximate those among the general adolescent population (Wiecha, 1996). A large proportion of minority adolescents (students from non-Anglo ethnic backgrounds) in the present sample perceived smoking to be an acceptable behaviour. Perhaps students who are more acculturated use smoking as a means to approximate an ideal of the Western culture (Frauenglass et al., 1997). If teenagers perceive that smoking is an accepted practice, they may adopt this behaviour as they embrace new cultural values and behaviours. Also, as minority adolescents adapt to the majority culture, they may be susceptible to adopting smoking as a way of identifying with majority adolescents, to form new friendships, or as a means to cope with identity problems, feelings of marginalization and cultural isolation (Velez & Ungemack, 1995).

The observation that foreign-born students were less likely to be smokers than their Canadian-born counterparts is congruent with findings from other studies of adolescents (Khoury et al., 1996; Velez & Ungemack, 1995) and mirrors the pattern of smoking among foreign-born versus Canadian-born adults (Chen et al., 1996; Millar, 1992). This “healthy immigrant” phenomenon may be closely related to the acculturation process. It appears that immigrant children and adolescents may be protected from substance use by strong cultural ties and familism (Balcazar et al., 1996; Khoury et al., 1996). That is, traditional immigrant families are likely to value strong family orientation and loyalty, familism over individualism, deference to parental authority, and spirituality or religion. Thus, immigrant adolescents may

be less likely to engage in smoking and other health-risk behaviours because these behaviours oppose family values (Frauenglass et al., 1997).

The finding that minority adolescents belonging to the second or higher generation are more likely to smoke than first generation minority adolescents is congruent with the suggestion that traditional values and behaviours will change as adolescents are exposed to dominant cultural influences (Brindis et al., 1995). This result is in line with observations from the U. S. which show that use of alcohol and other drugs increases among Asian and Hispanic adolescent populations, with second generation or those born in the U. S. showing higher levels of use than first generation arrivals (Austin & Pollard, 1993). Generational differences in smoking behaviour may reflect deteriorating parental control over youth behaviours and increasing acceptance of progressive values and norms by immigrant adolescents (Ferrence et al., 1996; Frauenglass et al., 1997; Khoury et al., 1996). Although there were no gender differences in smoking status for the sample as a whole, smoking status differed significantly between Asian male and female students. Asian female students, particularly those born outside of Canada, were much less likely to be smokers than their male counterparts. This pattern is congruent with gender disparities in smoking rates found in China and other Asian countries, where males have a much higher prevalence of smoking than females (MacKay, 1997; Koh, Geller, Chen, & Winder, 1993) .

Finally, the finding that students with stronger ethnic identity were less likely to engage in cigarette use supports the suggestion that ethnic identification may be a protective factor against substance use (Cheung, 1993b). The decreased likelihood of smoking among these students may be related to feeling positive about belonging to their ethnic group. Perhaps they

are less likely to use smoking as a means to fit in with majority peers or to deal with negative feelings about belonging to a minority ethnic group. Furthermore, students with weaker ethnic identity were also more likely to be highly acculturated. Again, being more acculturated and identifying strongly with the majority culture may encourage adherence to values and behaviours which are characteristic of the host society (Balcazar et al., 1996; Velez & Ungemack, 1995).

The most striking observation in the present study was the strong association between adolescent smoking and friends' smoking behaviour. Both within and across ethnic groups, smoking status of students was significantly related to the proportion of friends who smoke. This finding adds to a large body of evidence which demonstrates that the health behaviours of adolescents depend greatly upon the influence of their peers and friends (Flay et al., 1994; USDHHS, 1994). At this developmental stage, the behaviours of friends and peers are highly valued and this appears to apply across all ethnic adolescent populations. As suggested by Social Learning Theory, the evidence shows that peers are very attractive and influential models for teenagers. Clearly, teenagers are influenced by the values, beliefs and social norms acquired through relationships with friends and peers (McAlister, 1987). As suggested by Problem Behaviour Theory, risk behaviours such as cigarette smoking likely serve as a means to initiate entrance into and identification with peer groups. The finding that student smoking status was not associated with parents' smoking was unexpected but is supported by other studies which also found parental smoking to be a poor predictor of adolescent smoking (Landrine et al., 1994). The evidence on the influence of parental smoking is not as compelling

as those on peer influences (USDHHS, 1994). Perhaps by late adolescence, parental influence is no longer be as salient for teenagers as it was at an earlier age.

Predictors of Smoking Status

The present study attempted to extend current knowledge about the relationship between ethnicity and adolescent smoking by examining both differences in smoking rates between ethnic groups and the extent to which various dimensions of ethnicity influence smoking behaviour. The multivariate logistic regression showed that when all other variables in the model were accounted for, age, socioeconomic status, strength of ethnic identity, place of birth and friends' smoking were significant predictors of smoking status.

Similar to findings from the Youth Smoking Survey (Health Canada, 1996), older students in the present study had were more likely to be smokers. Also, as found in the bivariate analyses, students reporting weaker ethnic identity and students who were born in Canada had increased odds of being smokers. This finding supports the Acculturation Theory which suggests that as adolescents acculturate into mainstream society, they will likely embrace values, attitudes and behaviours that are perceived to characterize the new culture. Perhaps smoking is a means to establish an identity that is apart from their less acculturated parents and more in line with the models and behaviours encountered by teenagers outside the home (Frauenglass et al., 1997). Furthermore, in a new culture which values personal choice and independence, immigrant parents who hold traditional beliefs may have diminished parental authority and be less able to restrict their children's' activities (Ferrence et al., 1996; Khoury et al., 1996). The logistic regression also supported findings from numerous other studies which identify friends' or peers' smoking as the strongest predictor of adolescent

smoking (Dusenbury et al., 1992; (Royal College of Physicians, 1992; Conrad et al., 1992).

However, parental smoking was not an important predictor in the multivariate model. Thus, it appears that while the smoking behaviour of friends has considerable influence on whether a teenager will smoke or not, parental smoking does not play a key role.

Interestingly, the influence of ethnic group membership and school on differences in smoking status disappeared once the other variables were held constant. Thus, it appears that differences in smoking status according to school and broad ethnic group that were identified in the bivariate analyses (see Table 8) were due to differences in SES. In the present study, students from higher SES backgrounds were more likely to be smokers. This finding was unexpected and contradicts findings from most studies which identify adolescents from lower SES to be more likely to smoke and use other drugs (Lowry et al., 1996; USDHHS, 1994). Several reasons may account for this finding. First, cigarettes may not be readily available to youth from lower SES backgrounds due to economic constraints. For example, it has been suggested that having less money to purchase cigarettes may play a part in lower cigarette consumption among youth (Feigelman & Lee, 1995; McGraw et al., 1991). Surveys have shown that adolescent smoking rates fluctuate as price of cigarettes increase or decrease (Ferrence et al., 1991). Thus, students with less money may simply not be able to afford cigarettes. Furthermore, cigarettes may not be available in less affluent homes and money is probably strictly accounted for. On the other hand, teenagers from higher SES families likely have more allowance or pocket money to spend on cigarettes and may be able to take cigarettes which will not be missed from the home.

Second, students from lower SES may initiate cigarette use at a later age than students from higher SES backgrounds. This “cross-over” or “delayed onset” effect has been observed among African-American adolescents who generally belong to lower SES groups in the United States¹. While African-American teenagers have very low smoking rates, recent reports show that African-American adults have a higher prevalence of smoking and smoking-related diseases than the general population (Feigelman & Lee, 1995; Crews, 1994). Perhaps adolescents from lower SES families have fewer opportunities to obtain cigarettes and therefore are less likely to begin smoking at an early age. Low SES may manifest as a risk factor for smoking and other lifestyle choices later in life. Third, the present results may reflect a new trend of increased smoking among adolescents from higher SES backgrounds. This trend may be limited to the students and schools in this particular sample.

While this study showed that SES is a key intervening variable between ethnicity and health behaviours, the relationship not a simple one. It is likely that factors such as acculturation or immigrant status and SES have complex, interactive effects on smoking and other health-risk behaviours. The interplay of social, developmental, cultural and economic factors unique to various ethnic populations likely influence youth and their behaviour choices. This is an important area to pursue in future research. Furthermore, the present logistic regression was not a complete model of adolescent smoking. There are numerous other factors which may play a role in adolescent smoking, including religion, educational aspirations, ethnic origins of parents and grandparents, social support, circumstances surrounding migration,

¹ This may not be true for individual cases. This is a general observation supported by demographic data and other studies (see Crews, 1994).

traditional patterns of smoking and other health practices among different countries of origin, which were not addressed in this exploratory study. It is not clear how these and other factors may interact with SES and ethnicity to influence adolescent cigarette use.

The relationship between ethnicity and adolescent smoking is complex and multifaceted. The findings from the present study demonstrate the importance of researching patterns in smoking behaviour both between and within ethnic groups, especially given the rising number and diversity of immigrants in this country. In light of increased rates of youth smoking and the continued influx of immigrants into Canada, this line of research should be given high priority in cancer prevention research in this country. A better understanding of the patterns of behaviours that differentiate various populations will contribute to the development of strategies for prevention and intervention that can be more effectively tailored to specific adolescent subgroups (Brindis et al., 1995).

Strengths and Limitations of the Present Study

Although some findings in the current study were surprising, there are indications that the results can be accepted with relative confidence. In terms of the representativeness of the present sample, survey return rates did not vary widely across schools and the ethnic composition of each school sample was similar to the respective school's ethnic distribution. The smoking rate in the current sample closely mirrored the rates for Metro grade 11 students reported from the latest Ontario Student Drug Use Survey (Adlaf, 1997). Also, scores on the Multigroup Ethnic Identity Subscale, the scale used to measure strength of ethnic identity, for the present sample closely resembled scores reported for another multi-ethnic high school student population (Phinney et al., 1990) and demonstrated high internal reliability. Finally,

although it is possible that students' reports of level of SES (i.e. parents' highest education) were artificially inflated, it must be noted that Toronto's average annual household income is significantly higher than the average for the province and for the rest of Canada (Reus, 1997). Furthermore, the SES distribution of the current sample closely reflected those reported in the Toronto Board of Education's survey of students (Cheng et al., 1996).

At the same time, there were a number of limitations and methodological issues which must be noted when the present results are interpreted. First, the need to obtain active parent consent severely restricted the size of the present sample. The relatively low number of participants led to the need aggregate students into broader ethnic categories than those originally planned. Intergroup differences must be interpreted with caution because each ethnic group, namely Anglo, Asian, European and Other, consisted of heterogeneous and diverse individuals. For example, the Other category consisted of adolescents reporting African, Caribbean, Central American and other ethnic backgrounds. Homogenizing these diverse populations under one category was clearly problematic and may have concealed intra-ethnic differences in smoking behaviour and other research variables as well. A larger sample would have allowed for comparisons across more meaningful ethnic categories and for separate within group analyses. A larger sample would also have allowed for separate analyses for each school. Also, it is not known whether the active parental consent procedure introduced bias to the study. For example, certain ethnic groups may have been underrepresented because students in those groups did not have parent consent. The students who participated in this study (i.e., those students from whom active parent consent were obtained) could have differed from the students who did not participate (i.e., those students from whom parent consent were

not secured) in a number of ways, which ultimately may have influenced the present findings. The combination of a small sample size and a relatively low response rate raises serious concerns regarding the generalizability of the present findings. It is not clear whether the present sample accurately represented the Grade 11 population in Toronto nor is it certain whether these students were a representative sample of their respective ethnic populations.

The present study attempted to move from a simplistic conception of ethnicity by incorporating various dimensions of ethnicity such as place of birth, behavioural aspects, affiliative patterns and subjective reports. However, a second methodological challenge was in defining, operationalizing and measuring these research variables. For example, classifying individuals based on self-reported ethnic background was arbitrary because ethnic categories are culturally constructed categories (Kato, 1996). Even within cultures, the criteria for ethnic group membership may differ from one context to another. Every ethnic group is composed of diverse subgroups and individuals with different experiences and a distinct understanding about their own ethnicity (Pasick, 1997). This should be noted when the present results are interpreted.

Likewise, acculturation is a complex phenomenon composed of many processes and influenced by multiple factors (Deosaransingh et al., 1995). Although mastery of language or language use is commonly employed as a measure of acculturation (e.g. Landrine et al., 1994; Lovato et al., 1994) and is a critical aspect of acculturation, it does not adequately capture this multifaceted experience. Focusing on language alone is inappropriate because of variations in cultural congruity between the country of origin and the host country and the geographic location of the new country in relation to the country of origin (Lovato et al., 1994). In this

study, categorizing students as having high or low levels of acculturation was somewhat arbitrary. Other researchers have also noted that the relationship between acculturation and smoking remains unclear because instruments or measures used in past research have been plagued with psychometric shortcomings (Dusenbury et al., 1994; Deosaransingh et al., 1995).

It is also not clear whether parent education level was an appropriate measure of socioeconomic status (SES). In the present sample, it seemed that a disproportionately large number of students reported that their parents were university educated which placed them at a high SES classification. Furthermore, many students reported that they did not know their parents' education level. Thus, the unusual relationship found between SES and likelihood of smoking may be the result of an unsuitable SES measure. Although it is used widely, education may not necessarily be the best indicator of socioeconomic position (Guralnik & Leveille, 1997). Clearly, defining and measuring concepts such as ethnicity, acculturation and SES is challenging. Traditional means of adjusting for SES may not adequately elucidate this relationship. A potential reason for the limited number of studies examining cultural or ethnic factors in adolescent substance use is that ethnicity, acculturation, socioeconomic status and other related factors are difficult to define and measure (Smart, 1993).

Third, there were several limitations with respect to the statistical analyses which should be noted when interpreting the present results. The large number of bivariate chi-square analyses performed served to increase the probability of finding significant relationships. Due to the small number of participants in the various subgroup cells, few statistically meaningful comparisons could be performed among them. Furthermore, the relatively small overall sample size combined with a large number of predictor variables, particularly many categorical

predictor variables, led to an unbalanced multivariate model. Overall, the model predicted smoking status moderately well. Greater confidence in the findings could be obtained by repeating the study with a larger sample size in the future.

A fourth limitation of the present study is related to the challenges of employing a classroom survey research design. Due to limited resources, the homeroom teachers, rather than the investigator, were responsible for distributing and gathering the parent consent forms and the self-administered questionnaires. Students were not supervised during the survey process. The large number of teachers who refused to allow their class to take part or did not respond to requests to participate may have introduced bias. Furthermore, the parent consent forms and questionnaires were not translated into appropriate languages as originally planned. Unfortunately, students whose parents did not read or write English likely could not return the parent consent form and therefore did not take part in the study. Moreover, students for whom English is a second language may have had difficulty understanding and completing the questionnaire. Both the overall response rate, which was dependent upon securing active parental consent, and student responses to the survey questions was probably influenced by language barriers. Clearly, the need to obtain active parent consent resulted in high sample attrition and may have yielded underrepresentation of certain subgroups. While this was not unexpected, the low response rate likely biased the sample and the present results must be regarded in light of this caveat. Response rates did not differ significantly between the schools but it is not known whether response rates differed systematically between ethnic groups or between smokers and non-smokers.

Other methodological concerns or limitations were the cross-sectional nature of the study and the reliance on adolescents' self-report of substance use. Cross-sectional studies such as the present one cannot reveal causal relationships. For example, although smoking status was strongly related to friends' smoking, it is not known whether non-smoking teenagers adopt smoking in order to emulate their smoking friends or whether smokers tend to gravitate toward and form friendships with other smokers. As such, the associations identified between smoking status and other research variables in this study should not be considered as causal relationships. Also, cross-sectional studies do not reflect the developmental changes in cigarette use over time. This is important in light of the erratic nature of adolescent smoking patterns and the slow transition process towards becoming a regular, dependent smoker (McNeill, 1991).

With respect to self-report, there is a concern regarding honesty of students' responses but researchers have concluded that self-reports of cigarette smoking among youth are generally honest and valid (Bauman, Koch, & Bryan, 1982; Smart & Blair, 1978). Self-reports of smoking are also comparable across ethnic groups and smoking differentials are not likely attributable to reporting effects (Wills & Cleary, 1997). Finally, the present study's dependence on school samples obviously led to the exclusion of populations such as drop-outs, absentees and street youth, groups which generally have higher smoking rates (Swaim, Beauvais, Chavez, & Oetting, 1997; Wills & Cleary, 1997). Certainly, limited financial resources and logistical support were factors which made the survey process in this study challenging and likely influenced the subsequent findings.

Implications for Research

The prevention of tobacco use among children and adolescents remains a priority for both researchers and health care providers (Lerman, Rimer, & Glynn, 1997). Not only are further research efforts needed to identify the determinants of smoking initiation, maintenance and cessation among adolescents, there is also a clear need to account for how ethnic and cultural factors and their interaction with other etiological factors may influence smoking and other health-risk behaviours among youth (Lichtenstein, 1997). Perhaps the most important implication of the present study for future research is that the relationship between ethnicity and adolescent substance use is complex. Using ethnicity as a “background” variable or merely identifying ethnic differences in rates of cigarette use will not be sufficient for elucidating this relationship. Future research efforts must also be dedicated to exploring the potential reasons or dynamics which underlie ethnic differences. This will not be a simplistic task. The concept of ethnicity is multidimensional and subjective. The conceptual and methodological challenges associated with studying the relationship between ethnicity and substance use are formidable and researchers have generally shied away from pursuing this line of research (Adlaf et al., 1989; Smart, 1993; Trimble, 1996). However, there is a need for more in-depth studies which examine the causes and consequences of tobacco and other substance use for different ethnic groups. Several issues in particular need to be addressed.

First, improved mechanisms for identifying trends in adolescent cigarette use in Canada are greatly needed. At present, there is no annual national survey in this country that is comparable to the Monitoring the Future studies in the United States. The last comprehensive study, the Youth Smoking Survey, was completed in 1994 and did not include indicators of

ethnic background. The incorporation of ethnic group indicators in cross-national surveys would be useful for identifying regions and populations which are at increased risk for cigarette and other substance use.. For example, the biannual Ontario Student Drug Use Survey provides an excellent resource for research, policy and intervention initiatives.

Levels of cigarette use change over time and interact with gender, ethnicity, SES, population density, and region of the country (Cole & Weissberg, 1994). Adolescents from minority ethnic backgrounds, particularly those from lower socioeconomic strata, have been underrepresented in most study samples (Collins, 1992). A comprehensive, up-to-date database charting trends in smoking among diverse groups of adolescents would be crucial for the development of appropriate and effective tobacco control interventions in this country. Information derived from such surveys would have direct relevance for tobacco control and multicultural health policy. In order to gain a better understanding of the social distribution of health risk, ethnic and cultural patterns of health beliefs and health behaviours should be considered (Pappas, 1994).

Second, the linkage between acculturation and smoking behaviour requires additional study (Khoury et al., 1996). Reasons underlying the increased likelihood of smoking among highly acculturated adolescents, observed in the present study and as well as other studies, need to be investigated further. Longitudinal studies which track immigrant adolescents as they enter a new country and adapt to a new culture will help shed light on how the acculturation process influences adolescents' choices to smoke or not to smoke. Studies are needed to test the acculturation theory further and address questions such as: Do immigrant teenagers adopt smoking as a way to gain entrance into majority peer groups? Is smoking a means to cope

with feelings of isolation and discrimination for adolescents belonging to minority ethnic groups? Do immigrant children and adolescents perceive that smoking represents an ideal of Western culture and do they adopt smoking as a way to emulate this ideal? Do ethnic or cultural traditions fade as adolescents spend more time in the new society? Do immigrant parents forfeit control and authority over their children's behavioural choices in the new country? Are youth health behaviours influenced by ethnic or cultural differences in values about conformity and independence? The influence of acculturation on smoking and other health behaviours may also differ for males and females (Dusenbury et al., 1994; Goodenow & Espin, 1993).

Future research on acculturation should consider additional aspects of the process other than merely descriptive traits such as language use. Further knowledge is needed about the extent to which acculturation may be associated with various individual, familial and socioeconomic factors that either place minority adolescents at greater risk or function as protective mechanisms for them (Balcazar et al., 1996). One particular challenge will be to adequately capture the acculturation experience among adolescents and how it may affect their health behaviour choices. The use of qualitative methods, including interviews and focus groups, with adolescents from different ethnic backgrounds will be useful in delineating the complex relationship between acculturation and smoking behaviour.

A third priority in research will be to explore the interactive effects of ethnicity and socioeconomic status on smoking behaviour. Health behaviours and other risk factors for disease must be understood within the context of the living conditions that facilitate their initiation and maintenance. SES is a structural variable that is critical to understanding ethnic

variations in health and health behaviours (Williams & Rucker, 1996). It is important to delineate whether ethnic differences in smoking are attributable to differences in cultural beliefs and practices, to differences in SES between groups, or to the interactive effect of these factors (Pappas, 1994). Moreover, class differentiation within ethnic groups may lead to differences in attitudes about and patterns of cigarette and other substance use (Gottlieb & Green, 1987). This study demonstrated that ethnicity and SES should not be treated simplistically as background or control variables but should be considered as veritable determinants of health and health behaviours (Pasick, 1997).

This study has provided some preliminary insight into ethnic differences in smoking status and into the extent to which various dimensions of ethnicity influence smoking behaviour. Further research is needed to substantiate the present findings and to investigate the complex and multifaceted relationship between ethnicity and adolescent smoking. Future studies will have to strike a balance between making conclusions about ethnic group differences and recognizing that ethnic populations are made up of diverse individuals. Ethnic categories are far from being objective or static. Generalizations and stereotypes which mask the heterogeneity that exists within groups should be avoided (Collins, 1992; Mann & Kato, 1996; Trimble, 1996). Rather, the focus should be on how belonging to a certain cultural or ethnic group within various situational circumstances may influence adolescents' decisions about smoking and other health behaviours. Ultimately, information about ethnicity factors derived from rigorous research will be useful in enhancing understanding of the needs of both majority and minority ethnic teenagers and will facilitate the development of more relevant and effective tobacco control programs.

Implications for Policy and Intervention

The evidence from the present study suggests that cigarette smoking is still a common health-risk behaviour among adolescents. Adolescent smoking is an important public health concern because the vast majority of adult smokers begin the path to regular cigarette use at this young age and because of the negative health consequences caused by tobacco use (Chollat-Traquet, 1992; USDHHS, 1988). Smoking will be a long-term addiction for many adolescents who begin to smoke now (Pierce & Gilpin, 1996). Tobacco kills three times more Canadians than alcohol, AIDS, illicit drugs, car accidents, suicide and murder, all combined (Addiction Research Foundation, 1996). Studies from the U.S. show that overall smoking rates and smoking-related mortality have declined among men but have declined at a much slower rate among women, minorities and teenagers (Lerman et al., 1997). In fact, minority populations may be edging ahead of majority populations in prevalence of adult smoking and smoking-related disease (Ramírez & Gallion, 1993). At present, few smoking prevention programs have been designed to meet the needs of minority and/or immigrant ethnic groups (Beardall & Edwards, 1995).

This study demonstrated a need for prevention programs to convey to both majority and minority adolescent populations that cigarette smoking is not an acceptable behaviour. The findings point to a need for increased health promotion and education efforts for adolescents. Furthermore, health policy at the community, provincial and federal level must be committed to creating a social and economic climate that does not promote cigarette use by children and adolescents. Minority adolescents generally have low rates of smoking but as they become

acculturated to the majority culture, there may be an increased likelihood of initiating cigarette use.

A challenge for smoking prevention programs will be to address the experience of acculturation and its effects on teenagers' behaviour choices (Wiecha, 1996). In particular, youth who are new in Canada should receive education about the health hazards of cigarette use and be encouraged to remain non-smokers. There may be a unique window of opportunity for prevention efforts among immigrant children and adolescents. Current prevention programs, which are aimed at the "typical" English-speaking, middle-class adolescent and based on Western values and concepts of family dynamics, may not be equally effective for minority populations (Landrine et al., 1994; Legge & Sherlock, 1990-91). Delivering education and prevention programs which are linguistically appropriate and which include culturally relevant content may lead to more successful outcomes (Marin, Marin, Perez-Stable, Sabogal, & Otero-Sabogal, 1990; Parker et al., 1996). Ideally, the design of smoking prevention initiatives should reflect the values of the target community and include their input and feedback (Ramirez & Gallion, 1993).

As ethnic and cultural antecedents of smoking are better understood, specific information can be applied to education and intervention efforts which will be more sensitive to the unique conflicts and stressors faced by adolescents from diverse backgrounds. The findings from this study also showed that the influence of peers is very strong at this developmental period for adolescents from all ethnic backgrounds. Thus, prevention programs which include social influences components will be important for adolescents from diverse ethnic backgrounds.

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Appendix A

Procedure for Random Selection of Schools

<u>Region</u>	<u>Schools</u>	
North-East:	School 1	
	School 2	
	School 3	
	School 4	
	School 5	
	School 6	
	School 7	
	School 8	
	School 9	
	School 10	
	School 11	
	School 12

West-Central:	School 1	
	School 2	
	School 3	
	School 4	
	School 5	
	School 6	
	School 7	
	School 8	
	School 9	
	School 10	
	School 11

		<div style="display: flex; justify-content: space-between; width: 100%;"> Total 6 schools </div>

* one school which was originally sampled refused to participate; another school was randomly chosen in its place

Appendix B

Schematic Representation of Sampling Procedure and Sample Attrition

Appendix C

Survey Return Rates Information.

Schools	Grade 11 Population (total)	No. of Grade 11 Homerooms	No. of Homerooms Participated	Grade 11 Population (adjusted*)	No. with Parental Consent	No. with Parent Refusal	No. with Unreturned Consent	Present & Surveyed	Complete and Usable Surveys**
1	216	7	6	185	43	3	139	37	37
2	224	12	10	202	61	2	139	51	50
3	177	7	5	133	69	1	63	55	52
4	485	29	20	410	211	12	187	179	168
5	376	16	11	262	84	2	176	70	69
6	252	10	8	193	61	0	132	53	51
Totals	1730	81	60	1385	529	20	836	445	427

* Grade 11 population minus number of students from classrooms which did not participate (i.e., teachers refused participation)

** 18 questionnaires were not included in the analyses (i.e., large portion of questionnaire incomplete, ethnic background or smoking status not identified)

Appendix D

Parent Consent Form

Dear Parent/Guardian,

I am a graduate student at the University of Toronto and I am conducting a study to try to understand why teenagers may or may not smoke cigarettes. All of the students in your son or daughter's class have been randomly chosen to participate. Your son or daughter will be asked to spend approximately 15 minutes during class time to fill out a questionnaire which includes questions about their age, sex, place of birth, ethnic background, language use, attitudes about smoking and whether they smoke or not.

Participation in this study is **voluntary**. There is **no penalty** if you do not wish your son or daughter to participate and he or she can stop at any time during the study and/or refuse to answer any of the questions. This project has been approved by your school principal, the Toronto Board of Education and the University of Toronto. All information from this study will be kept completely confidential. Your son or daughter will not put his or her name on the questionnaire and only the researcher will see the completed questionnaires.

Please complete and return the bottom portion of this page whether or not you would like your son or daughter to take part in this study. If you have any questions or concerns, please feel free to call the researcher, Malissa Yang (922-6105) or the researcher's supervisor Dr. Harvey Skinner (978-8989). Thank you very much for your time and help.

Sincerely,

Malissa Yang
Graduate Department of Community Health
University of Toronto

Please check the appropriate box and send this form back to school with your son or daughter in the envelope that we have provided for you by DATE:

- ☐ I have read and I understand the permission letter. I give consent for my son or daughter to participate.
- ☐ I do not wish my son or daughter to participate in this study.

Name of Student: _____

(please print)

Name of Parent/Guardian: _____

(please print)

Signature of Parent/Guardian: _____

(please sign)

PLEASE COMPLETE AND SEND THIS FORM BACK TO SCHOOL WITH YOUR SON OR DAUGHTER BY DATE. THANK YOU FOR YOUR TIME.

Appendix E

Student Consent Form

Study Title: TEEN SURVEY

Researcher: Malissa Yang
Graduate Student
University of Toronto
(416) 922-6105

I am being invited to take part in a study which is interested in looking at teenager's backgrounds, attitudes and cigarette smoking behaviours. If I decide to take part, the questionnaire will take about 15 minutes to complete. This questionnaire is **not** a test and there are **no** right or wrong answers and I only need to try to answer every question as honestly as possible. I understand that I do not have to fill out the questionnaire if I don't want to. I can stop at any time I want and/or refuse to answer any of the questions. All the answers I give will be kept confidential. This means that no one but the researcher will ever read the answers and no one will know they are my answers. My teachers and parents will not ever read the completed questionnaire.

I have read this form and I agree to take part in this study.

Student's Name: _____
(please print name)

Student's Signature: _____
(please sign name)

Date: _____

Appendix F

Instructions: Most questions are followed by a list of answers or an empty space. Please choose the answer that is right for you and indicate your choice in one of the boxes or fill in your answer in the space provided. Please be completely honest and accurate when you answer the questions. If you do not wish to answer a question, leave it blank. But since this is an important study, we sincerely ask that you try your best to answer all the questions.

THANK YOU

Instructions: We are interested in some basic information about students like yourself.

Please check the box that is right for you in each question.

1. How old are you?

- ☒ 12 years of age or younger
- ☐ 13 years
- ☐ 14 years
- ☒ 15 years
- ☐ 16 years
- ☐ 17 years or older

2. Are you male or female?

- ☐ male
- ☐ female

3. In what grade are you?

- ☐ Grade 9
- ☐ Grade 10
- ☐ Grade 11
- ☐ Grade 12
- ☐ Grade 13 (OAC)

PLEASE CONTINUE TO THE NEXT PAGE

Instructions: In this country, people come from a lot of different cultures and there are many different words to describe the different backgrounds or ethnic groups that people come from. Some examples of the names of ethnic groups are English, Scottish, French, Italian, Polish, Chinese, Greek, Korean, African, Pakistani and so on. Every person is born into an ethnic group, or sometimes two groups, but people differ on how important their ethnicity is to them, how they feel about it, and how much their behaviour is affected by it. These questions are about your ethnicity or your ethnic group and how you feel about it or react to it.

Please read each item and fill in the space or check the box which indicates how much you agree or disagree with each statement.

4. **In addition to being Canadian,** please state what **MAIN** ethnic or cultural group or groups you think of yourself as belonging to.

(print answer in this space)

5. I have spent time trying to find out more about my own ethnic group, such as it's history, traditions, and customs.

- ☐ strongly agree
☐ somewhat agree
☐ somewhat disagree
☒ strongly disagree

6. I am active in organizations or social groups that include mostly members of my own ethnic group.

- ☐ strongly agree
☐ somewhat agree
☐ somewhat disagree
☐ strongly disagree

7. I have a clear sense of my ethnic background and what it means for me.

- ☒ strongly agree
☐ somewhat agree
☐ somewhat disagree
☐ strongly disagree

PLEASE CONTINUE TO THE NEXT PAGE

8. I think a lot about how my life will be affected by my ethnic group membership.

☒ strongly agree
☐ somewhat agree
☐ somewhat disagree
☐ strongly disagree

9. I like meeting and getting to know people from ethnic groups other than my own.

☐ strongly agree
☒ somewhat agree
☒ somewhat disagree
☒ strongly disagree

10. I am happy that I am a member of the group I belong to.

☐ strongly agree
☐ somewhat agree
☒ somewhat disagree
☐ strongly disagree

11. I sometimes feel it would be better if different ethnic groups didn't try to mix together.

☐ strongly agree
☒ somewhat agree
☐ somewhat disagree
☐ strongly disagree

12. I am not very clear about the role of my ethnicity in my life.

☒ strongly agree
☒ somewhat agree
☒ somewhat disagree
☐ strongly disagree

PLEASE CONTINUE TO THE NEXT PAGE

13. I often spend time with people from ethnic groups other than my own.

- ☐ strongly agree
- ☐ somewhat agree
- ☒ somewhat disagree
- ☐ strongly disagree

14. I really have not spent much time trying to learn more about the culture and history of my ethnic group.

- ☐ strongly agree
- ☐ somewhat agree
- ☐ somewhat disagree
- ☒ strongly disagree

15. I have a strong sense of belonging to my own ethnic group.

- ☒ strongly agree
- ☒ somewhat agree
- ☐ somewhat disagree
- ☐ strongly disagree

16. I understand pretty well what my ethnic group membership means to me, in terms of how to relate to my own group and other groups.

- ☐ strongly agree
- ☐ somewhat agree
- ☐ somewhat disagree
- ☐ strongly disagree

17. In order to learn more about my ethnic background, I have often talked to other people about my ethnic group.

- ☐ strongly agree
- ☒ somewhat agree
- ☒ somewhat disagree
- ☐ strongly disagree

PLEASE CONTINUE TO THE NEXT PAGE

18. I have a lot of pride in my ethnic group and its accomplishments.

- ☐ strongly agree
- ☐ somewhat agree
- ☐ somewhat disagree
- ☒ strongly disagree

19. I don't try to become friends with people from other ethnic groups.

- ☐ strongly agree
- ☐ somewhat agree
- ☐ somewhat disagree
- ☒ strongly disagree

20. I participate in cultural practices of my own group, such as special food, music, or customs.

- ☒ strongly agree
- ☐ somewhat agree
- ☒ somewhat disagree
- ☐ strongly disagree

21. I am involved in activities with people from other ethnic groups.

- ☒ strongly agree
- ☐ somewhat agree
- ☐ somewhat disagree
- ☐ strongly disagree

22. I feel a strong attachment towards my own ethnic group.

- ☒ strongly agree
- ☐ somewhat agree
- ☐ somewhat disagree
- ☐ strongly disagree

PLEASE CONTINUE TO THE NEXT PAGE

23. I enjoy being around people from ethnic groups other than my own.

- ☒ strongly agree
- ☐ somewhat agree
- ☒ somewhat disagree
- ☐ strongly disagree

24. I feel good about my cultural or ethnic background.

- ☐ strongly agree
- ☐ somewhat agree
- ☐ somewhat disagree
- ☐ strongly disagree

25. In what language or languages do you communicate with your parents?

- ☒ only or mostly English
- ☐ English and another language
- ☒ only or mostly another language

26. In what language or languages do you communicate with your friends?

- ☒ only or mostly English
- ☒ English and another language
- ☒ only or mostly another language

27. What proportion of your friends belong to the same ethnic group as you?

- ☒ none of them
- ☐ less than one-quarter of them
- ☒ about one-quarter of them
- ☒ about half of them
- ☒ about three-quarters of them
- ☒ all or most of them

PLEASE CONTINUE TO THE NEXT PAGE

28. Were you born in Canada? ☐ YES (if yes please go to question 31) ☒ NO (if no please continue to question 29)

29. Where were you born? _____
(please state country)

30. Approximately how many years have you lived in Canada?

☒ 1 year or less	☐ 9 years
☐ 2 years	☐ 10 years
☒ 3 years	☐ 11 years
☒ 4 years	☐ 12 years
☐ 5 years	☐ 13 years
☒ 6 years	☐ 14 years
☒ 7 years	☐ 15 year
☐ 8 years	☐ 16 years or more

31. Was your mother born in Canada? ☐ YES ☒ NO (if no, please state the country) _____

32. Was your father born in Canada? ☐ YES ☐ NO (if no, please state the country) _____

PLEASE CONTINUE TO THE NEXT PAGE

33. With whom are you living? (check one box only)

- ☐ Both father and mother
- ☒ Mother only
- ☐ Father only
- ☐ Guardian(s)
- ☐ On my own
- ☐ Other (please describe): _____

34. What are your parents' highest education levels? (check one box for each parent)

Mother

- ☐ elementary school (up to grade 5)
- ☐ secondary school (up to grade 12 or 13)
- ☐ community college
- ☐ university
- ☐ I don't know

Father

- ☐ elementary school (up to grade 5)
- ☐ secondary school (up to grade 12 or 13)
- ☐ community college
- ☐ university
- ☐ I don't know

35. This question is about your smoking behaviour. Please answer it honestly and choose only **ONE** box. **In the last 12 months**, how often did you smoke cigarettes?

(please go to
question 36) ←

- ☐ I have **never** smoked cigarettes in my lifetime
- ☐ I have smoked cigarettes but not in the last 12 months

(please go to
question 37) ←

- ☐ I tried one cigarette in the last 12 months
- ☐ I had **less than 1 cigarette a day** in the last 12 months
- ☐ I had **1 or 2 cigarettes a day** in the last 12 months
- ☐ I had **3 to 5 cigarettes a day** in the last 12 months
- ☐ I had **6 to 10 cigarettes a day** in the last 12 months
- ☐ I had **11 to 15 cigarettes a day** in the last 12 months
- ☐ I had **16 to 20 cigarettes a day** in the last 12 months
- ☐ I had **more than 20 cigarettes a day** in the last 12 months

PLEASE CONTINUE TO THE NEXT PAGE

36. In the next 12 months, how likely is it that you will smoke one or more cigarettes?

- ☐ very likely
- ☐ somewhat likely
- ☐ somewhat unlikely
- ☐ very unlikely

37. Generally, people who come from my ethnic background think that smoking cigarettes is....

- ☐ very acceptable
- ☐ somewhat acceptable
- ☐ somewhat unacceptable
- ☐ very unacceptable

38. Generally, people in Canada think that smoking cigarettes is....

- ☐ very acceptable
- ☒ somewhat acceptable
- ☐ somewhat unacceptable
- ☐ very unacceptable

39. What proportion of your friends smoke one or more cigarettes per week?

- ☒ none of them
- ☐ less than one-quarter of them
- ☐ about one-quarter of them
- ☐ about half of them
- ☐ about three-quarters of them
- ☒ all or most of them

40. Does at least one parent or guardian in your household smoke one or more cigarettes per week?

- ☐ YES
- ☐ NO

THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THIS SURVEY!

Appendix G

Debriefing Form

(given to students after questionnaires are completed)

The aim of the study that you just took part in is to look at the relationship between student's ethnic backgrounds and their cigarette smoking behaviour. We are interested in whether students from different ethnic backgrounds have different rates of smoking and whether your perceptions about smoking and ethnicity and the smoking behaviour of other people influence your choice to smoke or not to smoke.

Please be assured that all of your responses in the questionnaire will be kept completely confidential and the data from this study will be anonymous.

If you have any questions about this study please call the researcher, Malissa Yang at (416) 922-6105 or the researcher's supervisor Dr. Harvey Skinner (416) 978-8686.

Appendix H

Students' Self-Reported Ethnic Backgrounds

African	Ethiopian	Polish
American	French	Portugese
Anglo Saxon	German	Romanian
Antiguan	Greek	Russian
Arabic	Guyanese	Saint Kitts/Nevis
Armenian	Iranian/Persian	Scottish
Austrian	Irish	Slovakian
Barbados	Indian	Somalian
Bengladesh	Italian	South African
British	Jamaican	South American
Bulgarian	Japanese	Spanish
Caribbean	Korean	Sri Lankon
Chinese	Lithuanian	Swedish
Croatian	Malaysian	Tamil
Cuban	Moroccan	Thai
Czechoslovakian	Native	Trinidad/Tobago
Dutch	Nicaraguan	Turkey
Ecuadorean	Other	Ukranian
El Salvadorean	Pakistanian	Uruguay
English	Peruvian	Vietnamese
Estonian	Philippino	Welch

Appendix I

Criteria for Categorizing Students' Ethnic Background

Based on students' reported ethnic background (question 4, Appendix F), each student will be categorized according to the following broad ethnic categories. For example, if a student states that they are Greek, then he or she will be classified as Other European in the data analyses.

<u>Ethnic Category</u>	<u>Possible Responses</u>			
Anglo				
	English	French		
	British	Scottish		
	Irish			
Asian				
	Vietnamese	Taiwanese	Nepal	
	Chinese	Malaysian	Uzbekistan	
	Sri Lankan	Thailand	South East Asian	
	Philippino	Cambodian	Kazakhstan	
	Korean	Japanese	South Asian	
	Indian	Indonesian	Mongolian	
	Afghanistan	Macau	Pakistani	
	Burmian	Bangladesh	Singaporean	
Other European				
	Portuguese	Polish	Yugoslavian	Russian
	Welsh	Romanian	Bulgarian	Greek
	Hungarian	Italian	Czechoslovakian	German
	Albanian	Spanish	Bosnian	Herzegovina
	Swiss	Croatian	Dutch	Austrian
	Belgium	Swedish	Latvian	Lithuanian
	Danish	Finnish	Estonian	Maltese
	Belarusian	Iceland	Macedonian	Cyprus
	Georgian	Serbian	Jewish	

Ethnic Category**Possible Responses****African**

Ethiopian	Somalian	Ghana	Sudanese
Nigerian	South African	Kenyan	Zaire
Moroccan	African (unspecified)	Tanzanian	Ugandan
Egyptian	Algerian	Angola	Burundi
Libyan	Rwanda	Djibouti	Zimbabwe
Liberian	Mauritius	Central African	Mali
Sierra Leone	Malawi	Guinea	Zambian
Gambian	Cape Verde	Swaziland	Tunisia
East African	Nigerian	Chad	Seychille
Mozambique	Senegalese	Guinea-Bissau	Togo

**Central &
South American**

Guyanese	El Salvadorean	Ecuadorean
Peru	Brazilian	Guatemalian
Chilean	Nicaragua	Argentinian
Venezuela	Colombia	Panamanian
Honduras	Bolivian	Costa Rican
South American	Uruguay	Surinam
Paraguay	Belize	

Caribbean

Jamaican	Trinidad/Tobago	Grenadian
Saint Vincent	Barbados	Cuban
Dominican	Saint Lucia	Haitian
Antigua	Barbados	West Indian
Saint Kitts/Nevis	Bahamian	Caribbean
Bermuda		

Middle Eastern

Iranian	Turkey	Iraq
Israelian	Saudi Arabia	Syria
Lebanon	Kuwait	Yemen
Jordanian	Bahrainian	Qatar

Other

United States	Australian	all other responses
Unclassified	New Zealand	
Mexican	Western Samoan	