

Health-risk behaviours in emerging adults:
Examining the relationships among personality, peer, and parent variables

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Abstract

College students and emerging adults have been found to be at risk for smoking cigarettes, drinking to excess, using illicit drugs, driving dangerously, and engaging in risky sexual and delinquent behaviour. Psychosocial correlates (Sensation Seeking, peer behaviour, parent behaviour, and peer and parent anti-substance use messages) from three domains of influence (personality, parent, and peer) were examined together to provide a greater context for the occurrence of such health-risk behaviours. The strongest predictor(s) of each behaviour were identified to better inform intervention practices. Three groups were compared— 1) those who never tried substances, 2) those who tried substances in the past, and 3) those who continue to use substances at present, in a population of emerging adults. Self-report data was gathered from 203 Collèges d'Enseignement Général Et Professionnel (CEGEP) students in the Montreal region. Measures included: Reckless Behaviour Questionnaire, Reckless Driving Measure, Health Behaviour Survey, Sensation Seeking Scale—Form V, and the Marlowe-Crowne Social Desirability Scale. Results revealed that peer behaviour was the most significant predictor of substance use in emerging adults, whereas parent behaviour was only a significant predictor of reckless driving. Sensation Seeking, specifically Disinhibition, was found to predict more global reckless behaviours, including illegal activities, such as stealing or using marijuana ($p < .01$). Neither peer nor parent anti-substance messages were significantly related to any of the health-risk behaviours measured in this study. It would appear that health-risk behaviours tend to be related to the same underlying factors but to varying degrees. Intervention implications are discussed.

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Dedication

This dissertation is dedicated to my family, to whom I am eternally grateful— My parents, Leslie and Seymour Blum, who supported and encouraged me every step of the way through this degree; my sister, Stephanie Blum, who stood by me through this grueling process and helped me find my “zen” whenever it got lost; my brother, Daniel Blum, whom I could always count on for moral support and practical help; my daughter, Mia Cooperman, who brought a smile to my face during the revision stages; and my love and best friend, Cory Cooperman, whose unwavering support and belief in me helped me to achieve this amazing goal. Thank you all from the bottom of my heart.

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Introduction

Adolescents often experiment with behaviours that could be harmful to their health, such as smoking cigarettes, drinking alcohol to excess, using illicit drugs, and driving dangerously (Galambos & Tilton-Weaver, 1998; Moore & Rosenthal, 1993). Despite efforts to discourage such activities, today's youth not only experiment during adolescence but some engage in these types of health-risk behaviours well into their twenties (Arnett, 2000; 2005). Many factors from a variety of domains have been associated with participation in health-risk behaviours (Hawkins & Monahan, 2009). The most commonly cited ones include personality traits, peer modeling, and familial influences (Carlson, 2003; Lynskey, Fergusson, & Horwood, 1998).

The current study investigates health-risk behaviours in a population of youth between the ages of 17 and 21. The purpose of this study is threefold— 1) To examine psychosocial determinants of health-risk behaviours from three domains of influence to provide a greater context for the occurrence of such behaviours, 2) To identify the strongest predictor(s) of each behaviour in order to aid in the provision of targeted intervention, and 3) To compare three groups— i) those who never tried substances, ii) those who tried substances in the past, and iii) those who continue to use substances currently in order to identify predictors of variations in experimentation with substance use. The psychosocial correlates in this study include Sensation Seeking (personality factor), peer substance use behaviour and peer anti-substance messages (peer factors), and parent substance use behaviour and parent anti-substance messages (familial factors). This project addresses 2 important directions for future research identified by the National Adolescent Health Information Center (NAHIC): 1) the examination of “multiple influence models” for intervention purposes, and 2) the study of health-risk correlates that differentiate between “experimentation” and “damaging patterns of risk behaviour” (Millstein et

al., 1999). This study also contributes to the literature on emerging adulthood (the developmental period between adolescence and adulthood).

Behaviours that pose a threat to one's physical well-being are considered "health-risk behaviours". Smoking cigarettes, drinking too much alcohol, using marijuana, and driving dangerously all have potentially harmful consequences. Health-risk behaviours have been studied both individually and as part of a greater constellation of behaviours subsumed under various headings, such as "problem behaviour" or "reckless behaviour". Most of the literature in this area focuses on adolescents between 13 and 16 years of age despite the fact that some individuals between the ages of 18 and 25 continue to engage in health-risk behaviours (Bradley & Wildman, 2002). The majority of youth who experiment with health-risk behaviours manage to avoid any serious sequelae. Others, however, encounter an array of psychosocial difficulties as their behaviours endure, thus necessitating interventions (Jackson-Newsom & Shelton, 2010).

Defining health-risk behaviours

Health-risk behaviours, as their name implies, are any behaviours that have the potential to endanger one's health. Smoking cigarettes, getting drunk, using marijuana, driving dangerously, and engaging in risky sexual and delinquent activities all fall under the rubric of health-risk behaviours (Hair, Park, Ling, & Moore, 2009). The literature lacks consensus on the terminology so one must consider research on "risk behaviours", "risk-taking behaviours", "problem behaviour", and "reckless behaviours", as well as "health-risk behaviours", when endeavouring to study in this area.

A prominent researcher in the area of adolescent risk, Richard Jessor, expressed concern over the ever-changing terms to describe health-risk behaviours. He believed the epidemiological definition of risk as "[behaviours] that are associated with an increased probability of outcomes

that compromise health, the quality of life, or life itself” ought to be “expanded to encompass positive or desired outcomes as well as those that are adverse or negative” (Jessor, 1992). Jessor claimed that risk behaviours often serve a function in adolescents’ lives (e.g., smoking provides means to social acceptance) and are therefore “characteristic of ordinary psychosocial development”. Moreover, any harmful outcomes may be mere byproducts of such goal-directed activity (Jessor, 1992). Jessor distinguished risk behaviours from risk-taking behaviours, stating that the latter implies an awareness and appreciation of the risk involved—i.e., in risk taking, risk behaviour is understood as adolescents deliberately choosing to take risks “for the thrill that issues from the uncertainty of beating the odds”—and that in most instances that just is not true (e.g., smoking for the thrill of trying to avoid cancer). Jessor identified what he called “problem behaviour” as a subset of risk behaviours that merits inquiry and “[has been] socially defined as a problem, a source of concern, or as undesirable by the norms of conventional society, and [...] usually elicits some kind of social control response” (Donovan & Jessor, 1985).

Jeffrey Arnett, another prominent researcher in the field, critiqued the term “risk” for being too broad and encompassing behaviours that are socially acceptable and provide a sense of adventure (e.g., bungee jumping). As such, the term “risk” fails to capture the more dangerous activities in which adolescents partake, that have “the potential for immediate and serious consequences”. He also criticized the term “problem behaviour” for its breadth, stating that alcohol consumption and sexual activity may be considered “problem behaviour” but are not inherently risk-filled (Arnett, 1992b). Arnett proposed that the term “reckless” be used instead to refer to behaviours that are less socially acceptable and have an inherent potential for negative consequences (e.g., promiscuity) (Teese & Bradley, 2008). Arnett developed a measure of reckless behaviours that includes items assessing substance use, reckless driving, risky sexual

activity, and delinquency. Jessor, however, countered that the term “reckless behaviours” limits the scope too much and interferes with attempts to explain the driving forces behind these behaviours (Jessor, 1992). Clearly, there is a lack of uniformity in the field with regards to defining health-risk behaviours and this divergence has resulted in at least two different branches of health-risk behaviour research.

The behaviours in the current study were chosen on the basis of their heightened prevalence during adolescence and emerging adulthood, as well as their propensity for serious repercussions. Cigarettes, alcohol, and marijuana have been identified as the most commonly used substances among Canadian youth (Canadian Centre on Substance Abuse [CCSA], 2007). Substance abuse has been linked to reckless driving (Jessor, Turbin, & Costa, 1997), risky sexual practices, and delinquency. These behaviours typically begin in adolescence and drop off in adulthood, although for a distinct subgroup, such behaviours may continue throughout the lifespan. Some of the selected behaviours in this study may be considered socially acceptable (e.g., consuming alcohol) whereas others may not (e.g., shoplifting) and for the purposes of this study, the more general term “health-risk behaviours” will be employed. Epidemiological information on the aforementioned behaviours follows.

Epidemiological research on adolescent cigarette smoking

Despite growing awareness of the health risks involved, a large percentage of young people continue to smoke cigarettes (Gibbons & Gerrard, 1995; NIDA, 1998). According to Statistics Canada, 30% of female adolescents between the ages of 15 and 19 smoke, as do 28% of their male counterparts. Forty percent of Canadian female emerging adults between the ages of 20 and 24 smoke, as do 33% of their male peers (Galambos & Tilton-Weaver, 1998). Research has shown that the majority of adult smokers start smoking as teenagers

(Frankenberger, 2004; Griffin, Botvin, Doyle, Diaz, & Epstein, 1999). Moreover, cigarette smoking is considered one of the most preventable causes of death (Hwang, Yeagley, & Petosa, 2004) in North America. It has been associated with 90% of all cases of lung cancer and has been implicated in physical ailments such as chronic bronchitis, emphysema, stroke, heart attack, vascular disease, and aneurysm (NIDA, 1998). Cigarette smoking has been linked to psychological difficulties, as well. One study reported a positive relationship between smoking and anxiety disorders such as agoraphobia, panic disorder, and generalized anxiety disorder in adolescents (NIDA, 2001).

Epidemiological research on adolescent alcohol consumption

Just as smoking initiation typically occurs in adolescence, the consumption of alcohol often begins then, too (Kosterman, Hawkins, Guo, Catalona, & Abbott, 2000; O'Malley, Johnston, & Bachman, 1998). According to F. Li and colleagues (2002), it constitutes the most prevalent form of substance use during this developmental period. Studies have shown greater rates of alcohol consumption among teenagers in recent years (O'Malley et al., 1998) with a most notable increase of alcohol use after high school as adolescents enter college (Wood, Read, Mitchell, & Brand, 2004). Drinking alcohol can have serious medical, social, and legal repercussions (O'Malley et al., 1998). A recent study found binge drinking to be related to memory deficits in university students (Parada et al., 2011). Early and excessive alcohol use have been linked to increased morbidity and mortality (Rehm, Gmel, Sempos, & Trevisan, 2003; Sanford, 2001). According to Rehm and colleagues (2003), in a global study on alcohol-related morbidity and mortality, 1.5% of all deaths were attributable to alcohol. Alcohol consumption has been associated with a number of health problems, including cirrhosis of the liver, coronary heart disease, and various types of cancer. Irregular bouts of heavy alcohol consumption have

been found to contribute to heightened risk of blood clots within blood vessels (i.e., thrombosis) (Rehm et al., 2003). Alcohol consumption has also been implicated in the risk of sustaining injuries, such as bodily injuries from car accidents, self-inflicted wounds, and injuries resulting from interpersonal violence (Rehm et al., 2003; Walters, Bennett, & Noto, 2000). In addition to physical risks, alcohol use often comes with social risks. In another study, half of the adolescents who drank alcohol reported having done things while inebriated that they later regretted. In spite of such deterrents, adolescents continue to drink alcohol and report doing so because it is a social activity and they enjoy the effects of being intoxicated (O'Malley et al., 1998). Aside from liking the social aspect of drinking, one might hypothesize that adolescents drink recklessly because they believe that they are invincible—i.e., they believe that they are somehow immune to the damaging effects of alcohol (Rolison & Scherman, 2003). Fifty to 60% of individuals killed in car accidents have been found to have blood alcohol levels that exceed the legal limit (McKnight & McPherson, 1986) and many adolescents admit to having driven drunk (O'Malley et al., 1998; Windle, 2003), which may result in serious legal ramifications. Research has revealed that adolescents who drink alcohol are not only at risk of suffering medical, social, and legal consequences, but are also at a greater risk of using other substances later on in their lives (O'Malley et al., 1998; Windle, 2003) that may compound any alcohol-related problems.

Epidemiological research on adolescent marijuana usage

Adolescents who drink alcohol and smoke cigarettes have a high likelihood of trying illicit drugs (Kosterman et al., 2000). The rate of marijuana use among youth has been steadily increasing since 1990 (Bauman & Phongsavan, 1999; NIDA, 1997). Young people appear to be either unaware of or ignoring the potential adverse effects of marijuana use. Marijuana has been linked to memory, attention, and learning deficits (NIDA, 1997), as well as to respiratory

problems and malignancies similar to those associated with cigarette smoking, such as bronchitis and emphysema (NIDA, 2002), and head, neck, and lung cancers (Khalsa, Genser, Francis, & Martin, 2002 as cited in Lac & Crano, 2009). According to a 2002 report issued by the National Institute on Drug Abuse (NIDA), marijuana can be addictive, and can cause impaired judgement and coordination during intoxication. Although marijuana is the most commonly used illicit substance (Bauman & Phongsavan, 1999; NIDA, 2002), adolescents nowadays are exposed to a variety of other drugs, such as amphetamines and ecstasy, that can be even more harmful (Gowing, Henry-Edwards, Irvine, & Ali, 2002). Studies have shown that ecstasy use can result in irreversible brain damage due to neurotoxicity, hyperthermia (i.e., abnormally high body temperature) accompanied by seizures, and severe liver damage (Gowing et al., 2002). Research has shown that adolescents who abuse substances are at greater risk of injuring themselves (Miller, Lestina, & Smith, 2001), have higher rates of homelessness and negative encounters with the criminal justice system (Sanford, 2001), and are more likely to die prematurely than adolescents who do not use drugs (Miller et al., 2001). Substance use can become especially dangerous when individuals who are intoxicated decide to drive (Kelly, Darke, & Ross, 2004; Leadbeater, Foran, & Grove-White, 2008; Zimbardo, Keough, & Boyd, 1997).

Epidemiological research on adolescent reckless driving

Research in the area of reckless driving practices has been growing in recent years. Car accidents cause about 300 000 deaths worldwide per year (Kelly et al., 2004) and, alarmingly, adolescents have been shown to have more car accidents proportionally than any other age group (Sarkar & Andreas, 2004; Ulleberg & Rundmo, 2002). Approximately half of all adolescent deaths can be attributed to motor vehicle accidents (Donovan, 1993; Zimbardo et al., 1997), the leading cause of death for individuals aged 15 to 24 (Arnett, Offer, & Fine, 1997; Leadbeater et

al., 2008). Moore and Rosenthal (1993) reported that most of the adolescents in their study had been passengers in cars with dangerous and/or drunk drivers. Moreover, 70% of the male adolescents and 21% of the female adolescents in their study indicated that they had driven dangerously or when intoxicated themselves at some point in time. Other researchers have reported similar findings. In a study on college students done by Rolison and Scherman (2003), 27.4% of participants indicated that they had driven drunk within the 30 days prior to the study. O'Malley and colleagues (1998) reported that 1 in 5 adolescent drinkers in their study admitted to unsafe driving due to the influence of alcohol.

Despite this disturbing trend, alcohol accounts for less than half of all fatal car accidents involving youth (Arnett et al., 1997; Leadbeater et al., 2008). Reckless driving encompasses more than just drinking and driving, as it also includes speeding (Zimbardo et al., 1997), tailgating (Donovan, 1993), ignoring traffic signs and signals, not wearing seatbelts (Gibbons & Gerrard, 1995; Williams, 2006), and driving under the influence of drugs (Kelly et al., 2004; Leadbeater et al., 2008). According to Leadbeater and colleagues (2008), approximately 23-40% of North American youth report driving with someone who is intoxicated at the wheel. Research has shown that adolescents who engage in one reckless driving behaviour are more likely to engage in other such behaviours (Jonah, 1997). In a study on student drivers, researchers found that those who reported driving with a reckless driver were more likely to report driving with a drunk driver or a driver who was drag racing and were less likely to report wearing seatbelts (Sarkar & Andreas, 2004).

The fact that young people continue to drive dangerously, use marijuana, get drunk, and smoke cigarettes in spite of health concerns suggests that there are other factors at play. This

study seeks to identify some of these psychosocial factors in order to better inform prevention and intervention strategies.

Constellation of behaviours: Research on global reckless behaviours

Researchers have noted that health-risk behaviours do not occur in isolation but rather tend to co-occur. Correlations among smoking, drinking, and drug use in teens typically range from 0.30 to 0.39 (Donvan, 1993; Lynskey et al., 1998; Teese & Bradley, 2008). Jessor theorized that these behaviors, which cluster together, may be more aptly considered a “syndrome” than separately occurring conditions (Jessor, 1992). For this reason, a measure of global reckless behaviour was included in the current study. While this notion has been studied extensively (Hair et al., 2009), the contributing factors to such a syndrome have not been thoroughly investigated (Lynskey et al., 1998). The current study contributes to the literature by examining psychosocial factors from a variety of domains that relate to this constellation of health-risk behaviours.

Multiple determinants of health-risk behaviours

There is evidence to suggest that health-risk behaviours co-occur and as such represent a syndrome of sorts (Jessor, 1992). Certain predictors across specific domains of influence (e.g., individual, peer, and familial) have been identified as shared risk factors for these co-occurring behaviours (Hawkins & Monahan, 2009). Historically, researchers considered one or possibly two domains of influence on a given health-risk behaviour but failed to consider a more complex picture. Jessor developed Problem Behaviour Theory (PBT) to address this gap in the literature. This comprehensive theory is comprised of factors across individual, peer, and familial domains, however, it neglects to incorporate a key element of the individual domain, namely the personality trait known as Sensation Seeking (Carlson, 2003). Arnett’s theory of recklessness in adolescence features Sensation Seeking but has not been as widely tested as PBT.

The current study includes both personality and social factors that have been well supported in past research. Personality traits, peer pressure, and familial influences are among the most commonly studied psychosocial correlates of health-risk behaviours (Carlson, 2003; Lynskey et al., 1998). In particular, individual differences in Sensation Seeking, defined as the need for “varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences” (Zuckerman, 1979 as cited in Hoyle, Stephenson, Palmgreen, Puzles Lorch, & Donohew, 2002) have been associated with the aforementioned behaviours (Frankenberger, 2004; Jonah, 1997; Teese & Bradley, 2008). Parents and peers have also been implicated in the initiation and maintenance of such behaviours (e.g., Arnett, 2007; Arnett et al., 1997; Kobus, 2003; Lynskey et al., 1998; Maxwell, 2002; Prinstein, Boergers, & Spirito, 2001; Wood et al., 2004) through both social modeling (Bailey, Ennett, & Ringwalt, 1993; Chassin, Presson, Sherman, Montello, & McGrew, 1986; Chen, Grube, Nygaard, & Miller, 2008; Latendresse et al., 2008) and transmission of attitudes or messages (i.e., statements communicating the dangers of such behaviours, for instance, anti-smoking messages) (Griffin et al., 1999; Middlecamp Kodl & Mermelstein, 2004; Kosterman et al., 2000; Piko, 2001; Wood et al., 2004).

A major limitation of past research, however, is that there is a paucity of studies examining these factors all together (Carlson, 2003). People do not exist in a vacuum and by merely considering personality variables, there is a failure to acknowledge the social system that surrounds young people. Drawing conclusions about innate vulnerabilities without the added considerations of the impact of overt and covert social influences provides only a partial picture. By the same token, examining factors in one’s social system without looking at individual personality variables is equally incomplete. Jessor (1992) articulated this point clearly when he

stated that “any responsible account of adolescent risk behaviour [... must] engage multiple explanatory domains”. Moreover, one might argue that the impetus to study these domains together arises from the need to clarify the degree to which common factors are associated with co-occurring health-risk behaviours to better inform intervention practices. Current interventions remain highly specific per problem despite the fact that such problems co-occur (Hawkins & Monahan, 2009) and arguably would benefit from research of this nature.

Jessor’s Problem Behaviour Theory and Arnett’s developmental theory of recklessness in adolescence both meet the current standard for a “multi-dimensional approach” (Arnett, 1992b). In Jessor’s Problem Behaviour Theory, he stresses the importance of risk versus protective factors across a variety of contextual domains in predicting problem behaviour. He defines risk factors as “behaviours that can compromise health, well-being, or social performance” (Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995) and defines protective factors as “factors that function actively to promote positive behaviour and development and, in doing so, have a direct mitigating effect on the impact of risk factors” (Jessor, 1992). Jessor identifies a number of psychosocial domains containing both risk and protective factors that contribute to adolescent health-risk behaviour. These domains include 1) Biology/Genetics, 2) Social Environment, 3) Perceived Environment, 4) Personality, and 5) Behaviour. However, Jessor’s Problem Behaviour Theory only focuses on the latter 3 of these 5 domains (Jessor, 1987, 1992). Jessor (1992) acknowledges that there are biological underpinnings to adolescent risk behaviour (e.g., differences in intelligence) and variations in environment (e.g., poverty) that likely play a significant role in such behaviour but his research is primarily comprised of testing psychosocial factors.

Jessor (1987) theorizes that factors within an adolescent's "perceived environment" may put him/her at risk of engaging in problem behaviour. Specifically, he postulates that modeling of such behaviour by both parents and peers can render youth vulnerable and lead them to succumb to similar behaviour (Jessor, Turbin, & Costa, 1998). Moreover, he contends that the extent to which parents and peers approve of problem behaviours has an impact on adolescent problem behaviour, as well (Jessor, 1987).

According to Jessor (1987), "personality" factors, such as one's values, personal beliefs, expectations, and attitudes play an important role in adolescent problem behaviour, as well. He postulates that youth who value high academic achievement and do not value independence, have high expectations of achieving their goals, have a tendency toward higher self-esteem coupled with a lower tolerance for deviance, and do not feel alienated nor the need for social criticism, will be unlikely to engage in problem behaviour.

Finally, Jessor contends that certain "behaviour" will increase the likelihood of problem behaviour, namely partaking in activities that are unconventional and have a high chance of incurring social controls (e.g., truancy). Jessor (1987) states that adolescents may engage in problem behaviour in order to express disdain for conventional rules or to reinforce one's image or status among peers. He also theorizes that engaging in such behaviour may serve as an important "transition-marker" from adolescence to adulthood. Jessor (1992) proposes that behaviour such as poor school performance puts youth at risk whereas behaviour such as attendance at religious institutions serves as a buffer against problem behaviour.

In summary, PBT uses an interactional perspective to address health-risk behaviour in adolescents. Jessor theorizes that problem behaviours occur as a result of the interplay of risk and protective factors in an individual's personality and social milieu.

In Arnett's developmental theory of reckless behaviours (1992a; 1992b), he highlights Sensation Seeking as a mediator between broad socialization and reckless behaviour. Arnett emphasizes two predispositions, Sensation Seeking and egocentrism, and states that they must be considered in the context of socialization influences. He describes two types of socialization, narrow and broad. Narrow socialization is characterized by a set of behavioural rules that have clear consequences if broken. Broad socialization, on the other hand, is defined as the lack of prescribed regulations or conventions. Arnett purports that Sensation Seeking is more easily expressed in the context of broad socialization. He believes that Sensation Seeking mediates the relationship between broad socialization and reckless behaviours in adolescents. Arnett states that males are more likely than females to score highly on measures of Sensation Seeking and to engage in reckless behaviours. He describes an array of socialization contexts, including peers, family, school, community, the legal system, cultural beliefs, and the media (Arnett, 1992a, 1992b).

According to Arnett (1992a, 1992b), clear models and messages differentiating right from wrong help to prevent engagement in reckless behaviours during adolescence. He explains how examples of proper conduct can be delivered in various contexts with varying influential sway. Arnett recognizes that peers tend to have the most influence at this developmental stage and that most reckless behaviours occur in groups rather than when the adolescent is alone. He states that peer groups made up of low Sensation Seekers are more likely than groups of high Sensation Seekers to choose to partake in less reckless activities (i.e., standards of conduct are set within the group).

Arnett goes on to acknowledge the role parents play in socializing their teens. He states that the extent to which parents monitor their children's behaviour and provide unambiguous

messages about acceptable behaviour determines engagement in reckless behaviours. He also stresses the importance of providing clear consequences for unacceptable behaviour (1992a).

Furthermore, Arnett expands the range of socialization influences to include schools and their roles in preventing or fostering reckless behaviours in this population. Arnett postulates that schools with high expectations for their students to excel and strict rules to follow (e.g., attend classes, abide by the dress code, etc.) are more likely than schools with lax rules and low expectations to prevent their students from engaging in reckless behaviours. He reports that private schools have been found to have lower rates of problem behaviour as compared to public schools, probably due in part to different disciplinary policies (1992b).

Arnett explains that community influences impact reckless behaviours, as well, insofar as large urban settings encourage independence and tend to be less rule-bound than small “tight knit” communities. He admits, however, that there is variation within urban communities, often due to religious beliefs of particular sects. Religiosity (i.e., the extent of participation in religious services, as well as self-declared importance of religion in one’s life) is related to “self-restraint, self-control, [and] self-sacrifice” (Arnett, 1992b), which Arnett juxtaposes against the messages conveyed through the mass media, such as “self-indulgence, self-satisfaction, [and] immediate gratification” (1992b). He claims that religiosity buffers against reckless behaviour whereas exposure to the media heightens it.

Finally, Arnett discusses the role of the community’s legal system and how strict laws work to prevent reckless behaviours. The prime example he uses is the case of driving laws in the United States. The more restrictions placed on young people learning to drive (and on the age at which they are permitted to buy alcohol), the less likely they are to get into automobile accidents (1992b).

In summary, Arnett's developmental theory of reckless behaviours takes into account personality and social contextual factors when examining reckless behaviours in youth. Arnett theorizes that personality differences are fundamental in determining whether or not youth will engage in reckless behaviours if the social contexts permit.

Arnett's notion of narrow versus broad socialization (Arnett, 1992a, 1992b) seems to mirror Jessor's notion of conventional versus unconventional behaviour (Jessor, 1992). Moreover, both researchers identify the following social influences as crucial promoters or deterrents of health-risk behaviours: peers, parents, schools, religion, and the media (Arnett, 1992b; Jessor, 1987, 1992). Finally, they both agree that health-risk behaviours are interrelated and are best studied together rather than individually (Arnett, 1992a; Jessor, 1992).

Arnett stresses that peers are most influential during adolescence and theorizes that peer modeling and conveying of a clear standard of conduct are key predictors of reckless behaviour (1992a), whereas Jessor describes both modeling (1987; Jessor, et al., 1998) and what he calls peer "approval" of problem behaviour as essential predictors in this area (Jessor, 1987). Such approval could be measured in verbal endorsement or censure of behaviours like smoking, drinking, and illicit drug use. Similarly, both researchers note the influence of parental modeling and Arnett reiterates the importance of unambiguous communication of acceptable ways of behaving (Arnett, 1992a), whereas Jessor once again highlights the role of parental "approval" of problem behaviours (Jessor, 1987). It can be argued that they are referring to the same notion of peer and parental messages despite the differences in semantics.

In terms of schooling, Arnett makes the distinction between private and public schools and suggests that private schools act as a deterrent for reckless behaviour (Arnett, 1992b). Jessor, on the other hand, emphasizes academic achievement (Jessor, 1987), but one might expect

successful school performance to be valued more in private academic establishments, which tend to set more rigorous standards for admission and conduct. Similarly, religiosity is a concept that both theories share, i.e., the stronger the religious belief and attendance at religious institutions, the less likely the involvement with reckless behaviours (Arnett, 1992b, Jessor, 1992). Lastly, both theorists condemn the influence of the media on adolescents (Arnett, 1992b, Jessor, 1987) and submit that exposure to television, music, and magazines promote unconventional ways of behaving, which may lead to engagement in health-risk behaviours.

Arnett and Jessor both offer elaborate and complex theories of adolescent health-risk behaviour. Despite their different foci, these theories have several overlapping concepts, such as the impact of peers and parents, which appear to be at the crux of the development of health-risk behaviours. Both Arnett and Jessor state that personality factors also play a critical role in this process (Arnett, 1992a; Jessor, 1987), however PBT does not include Sensation Seeking variables, which may help to elucidate some of the “large segment of the variance [...] left unexplained” in previous research (Jessor, 1992).

The psychosocial correlates in the current study were chosen on the basis of their theoretical and empirical merit. PBT is arguably the most thorough and complex developmental theory of health-risk behaviour. Social context is considered a fundamental part of this theory and is broken down into parent and peer variables. Personality is also a key component of PBT, however, this domain is limited as it neglects Sensation Seeking variables, which have overwhelming empirical support as correlates of health-risk behaviours (Carlson, 2003). The current study therefore examines Sensation Seeking as well as peer and parent variables in relation to health-risk behaviours with the aim of revealing the relative associations between predictors and each health-risk outcome.

Personality traits: Research on Sensation Seeking

For the past 40 years, researchers have studied individual factors affecting health-risk behaviours, including personality variables such as Sensation Seeking (Arnett, 1996; Frankenberger, 2004; Galizio, Rosenthal & Stein, 1983; Kaestner, Rosen & Appel, 1977; Newcomb & McGee, 1991; Schierman & Rowland, 1985; Simo & Perez, 1991; Wagner, 2001; Wills, Vaccaro, & McNamara, 1994; Zuckerman, Bone, Neary, Mangelsdorff, & Brustman, 1972). The term Sensation Seeking has been used to describe individuals who “need varied, novel, and complex sensations and experiences to maintain an optimal level of arousal” (Zuckerman et al., 1972). Zuckerman and colleagues (1972) developed a measure to assess Sensation Seeking traits and established four subtypes: Thrill and Adventure Seeking, Experience Seeking, Disinhibition, and Boredom Susceptibility. Individuals who score highly on Thrill and Adventure Seeking tend to show an affinity for recreational sports or activities that involve speed and danger, such as in-line skating. For individuals who score highly on Experience Seeking, the emphasis is on inner experiences and they tend to require a wide range in order to feel stimulated (e.g., someone who is moved by art or music), whereas those who score highly on Disinhibition tend to enjoy externally stimulating experiences, such as “wild” parties. Individuals who score highly on Boredom Susceptibility tend to enjoy novelty and move rapidly from one task to another.

Personality is a multi-faceted construct and for the purposes of this study, it was important to narrow down the sphere of influence to finite and measurable characteristics known to be related to health-risk behaviours. Sensation Seeking traits were selected to represent the domain of personality influences on health-risk behaviours in emerging adults because of Arnett’s developmental theory of recklessness in adolescence (Arnett, 1992a; 1992b), which is

supported by studies that have implicated Sensation Seeking in experimentation with smoking, drinking, and drugs (Arnett, 1996; Bradley & Wildman, 2002; Clapper, Martin, & Clifford, 1994; Frankenberger, 2004; Wagner, 2001; Zuckerman et al., 1972), as well as reckless driving (Jonah, 1997). Some researchers have noted that Sensation Seekers do not seek out danger per se but in their attempts to find activities that are stimulating, they are often faced with risk (Roberti, 2004); this conceptualization is quite compatible with Jessor's contention that adolescents do not purposefully seek out problem behaviours for the risks involved (Jessor, 1992).

Frankenberger (2004) examined the relationship between Sensation Seeking, egocentrism, risk perception, and cigarette smoking in a sample of 215 high school students aged 14-18. She found that adolescents who reported smoking regularly tended to have higher levels of Sensation Seeking than did their non-smoking counterparts. She also reported higher Sensation Seeking levels for male adolescents than female adolescents, findings that are consistent with previous research. Sensation Seeking has not only been found to be related to smoking but to drinking, as well. Clapper and colleagues (1994) tested Sensation Seeking in a sample of 575 college students within the context of a study on personality, social environment, and past behaviour associations with alcohol use. They reported that Sensation Seeking played a significant role in late adolescent alcohol use (Clapper et al., 1994). Similarly, Wagner (2001) studied Sensation Seeking, anxiety sensitivity, and self-reinforcement in relation to substance abuse and risk taking in a sample of 155 undergraduate students. He found that Sensation Seeking was a significant predictor of substance abuse, risky sexual behaviour, theft and vandalism, and reckless driving. In conducting a literature review on Sensation Seeking and risky driving, Jonah (1997) reported that the vast majority of studies found significant positive associations between the two variables. He described how some studies concluded that high

Sensation Seekers perceive less risk in certain driving practices whereas others concluded that high Sensation Seekers are aware of the risks but accept them as part of the experience. Jonah found support for the hypothesis that the relationship between Sensation Seeking and risky driving decreases with age and stated that the subscales of Sensation Seeking have seldom been considered in the research (Jonah, 1997).

Carlson (2003) examined the relationship between family support, peer relationships, Sensation Seeking, academic skills, and problem behaviours in a sample of 218 adolescents. He used Structural Equation Modeling (SEM) to assess models of these predictors and found that Sensation Seeking was a critical predictor of problem behaviour even when controlling for familial and peer influences. Family support included measures of perceived social support from family members, parental monitoring, and attachment. Peer relationships included measures of perceived social support from peers, attachment to peers, and peer delinquency (cheating, vandalizing, stealing, violence, etc.). The current study examined an older population and tested predictors of health-risk behaviours from the same domains, i.e., personality, peer, and family.

Longitudinal research in this area also lends support to the association between personality characteristics and health-risk behaviours. Slutske and colleagues (2005) examined Multidimensional Personality Questionnaire (MPQ) data gathered at age 18 from a sample of 1525 participants wherein 899 of them were identified as having a gambling problem at age 21. Participants were part of a New Zealand longitudinal research project on health and behaviour. The researchers found that individuals with problems gambling had “strikingly similar” personality structures to those with addictions to alcohol, cannabis, and nicotine. Specifically, they tended to be lower on harm avoidance (a reversed measure of Sensation Seeking tendencies) and self-control (a reversed measure of impulsivity) than their contemporaries who did not

display addictive behaviour. Taken together, the empirical evidence strongly reflects an association between Sensation Seeking and health-risk behaviours in adolescents and lends support to the use of the Sensation Seeking scale in the current study.

Peer influences: Research on modeling and messages

Personality variables are not the only factors in play when it comes to young people and health-risk behaviours; research suggests that parents and peers matter, too (e.g., Allen & Brown, 2008; Lac & Crano, 2009). The current thinking in much of today's developmental psychology research is that nature and nurture interact and biological traits create a predisposition that may or may not be manifested depending upon the environmental influences an individual encounters (Feldman, 1998). Although personality traits are important contributors to behaviour (Plomin & Caspi, 1999), some researchers argue that their impact is indirect and happens through cognitive and social processes (McCauley Ohannessian & Hesselbrock, 2007; Wills & Dishion, 2004).

When considering social processes in the development of health-risk behaviours in emerging adults, two main socialization sources come to mind— parents and peers—based on Jessor and Arnett's theories (Arnett, 1992a; 1992b; Jessor, 1992). In early development, parents help their children to navigate the world by offering them behavioural instruction (e.g., look both ways before crossing the street) and by teaching them values (e.g., it is important to treat others with respect) (Lac & Crano, 2009). Later on in development, through adolescence and into the emerging adulthood years, parents tend to have less contact with their children, and their influential impact tends to be more limited (Arnett, 2005). Adolescence is often characterized by a shift away from parental influence toward peer influence (Spear & Kulbok, 2004; Wood et al., 2004). Research on peer influence reveals significant positive associations between peer and adolescent health-risk behaviour (e.g., Bailey & Hubbard, 1991; Prinstein et al., 2001). It is

believed that individuals are often influenced by their peers because they want to gain social status or acceptance within a group (Kobus, 2003). In both parent and peer socialization processes, there are attempts to influence the individual that are both overt (e.g., a stated message against smoking cigarettes) and covert (e.g., modeling smoking behaviour) (Chassin et al., 1986; Middlecamp Kodl & Mermelstein, 2004).

There is a vast body of research on peer factors and health-risk behaviours (Arnett et al., 1997; Chassin et al., 1986; Kosterman et al., 2000; Prinstein et al., 2001). Maxwell (2002) studied the impact of peer influence on substance use and onset of sexual behaviour in 1969 adolescents from the National Longitudinal Study of Adolescent Health. The participants, students in grades 7-12, completed questionnaires on 2 occasions. The adolescents were asked to list their 5 closest friends and one of their same sex friends was selected at random for the purposes of examining peer influence. Maxwell found that friends exerted influence over adolescents' level of risk behaviour. She also found that peer influence was greater for initiation than for maintenance of cigarette smoking and marijuana use suggesting that the influence of peers may be short-lived and that other factors may be at play in maintaining adolescent substance abuse. This study provided important information about the impact of friends on adolescents' health-risk behaviour over time. Rather than focus on a single behaviour, a variety of behaviours were considered but the author did not report on the interrelationships among these health-risk behaviours. The researcher only examined same sex friends despite the fact that adolescents have friends of the opposite sex who are probably also important influences. Finally, this study employed only dichotomous measures of adolescent health-risk behaviours and did not consider variables such as frequency of engagement in the behaviours, which would be important in determining the extent of such dangerous behaviours.

Kobus (2003) reviewed current theories and empirical studies on peer influences on adolescent smoking. She discussed the relevance of social learning theory (the notion that smoking is a learned behaviour that may be reinforced by positive experiences with peers), primary socialization theory (the importance of considering contextual variables associated with adolescent smoking, such as family, school, and friends), social identity theory (the relevance of group norms and attitudes in adolescent smoking), and social network theory (the emphasis on peer interaction and peers as reference points for adolescents who smoke cigarettes). Kobus found that adolescents who have friends who smoke are more likely to smoke themselves. However, she raised the issue of whether this finding reflects the influence of peer selection rather than peer influence (i.e., teenagers may choose friends with similar habits rather than be influenced by friends to engage in such habits). Kobus (2003) reported that just as adolescents who smoke tend to have friends who smoke, teenagers who do not smoke tend to belong to peer groups that almost entirely consist of non-smokers. One of the most significant findings that Kobus reported is that the influences of peers are more indirect than previously thought (i.e., adolescents who smoke do not tend to actively pressure their friends to smoke, but rather they may portray a certain image of “being cool” or be an effective model because of their high social standing and that in turn leads their friends to engage in similar behaviours in order to fit in). Kobus concluded that such subtleties of peer pressure ought to be taken into account when designing prevention and intervention programs for adolescent smoking. This review of the literature provides a comprehensive synthesis of the past research and lends support to the relationship between peer factors and smoking patterns in adolescents.

Similar findings were reported in studies on peer factors and alcohol, marijuana, and reckless driving. F. Li and colleagues (2002) investigated the impact of peer influence on alcohol

use in 188 adolescents between 14 and 18 years of age using a national dataset. They found differences in peer influence according to levels of alcohol consumption. Specifically, the authors reported that exposure to deviant peers was more strongly associated with alcohol consumption for adolescents who drank in the low-average range than for those in the high-average range. They suggested that peers matter most for normative drinking processes but for problem drinking they postulated that other factors may need to be taken into account, such as individual differences in temperament and familial substance use patterns.

Bailey and Hubbard (1991) examined the relationships between peer factors and adolescent marijuana use in a sample of 3454 students in grades 6-8. Participants were assessed twice and by Time 2 most were in grades 7-9. The researchers reported that perceived friends' marijuana use was strongly associated with adolescents' marijuana use, especially for younger participants. Also, perceived peer behaviour was more strongly associated with adolescent behaviour than was perceived peer attitude. The authors concluded that peer marijuana use and adolescent marijuana use are highly correlated and they identified a need for future research on this distinction between peer behaviour and attitude in terms of factors of influence.

Allen and Brown (2008) examined a range of peer factors that may contribute to adolescent risky driving, including distraction that is either passive (e.g., chatting when the driver needs to concentrate) or active (e.g., playing loud music), acts of disruption (e.g., the passenger grabbing the steering wheel), and incitement (e.g., encouraging the driver to "catch up" to someone on the road). They also discussed the tendency for adolescents to want to please their peers (and be reluctant to alienate them), the inability to see facial expressions while driving, the need for adherence to conventional behaviour when behind the wheel, and the inevitable occurrence of divided attention when passengers are in the car. The authors concluded

that empirically exploring the impact of peer influence on adolescent driving would likely offer significant insights for intervention approaches in the future. In summary, past research strongly supports an association between peer factors and health-risk behaviours in adolescents, which accounts for their inclusion in the current study.

Parent influences: Research on modeling and messages

There is substantial empirical support for the impact of peer behaviour and attitudes on adolescent health-risk behaviours (e.g., Kosterman et al., 2000; Prinstein et al., 2001; Wood et al., 2004) but there is also an abundance of research on parental factors contributing to health-risk behaviours (e.g., Bailey et al., 1993; Chassin, Presson, Todd, Rose, & Sherman, 1998; Griffin et al., 1999). C. Li and colleagues (2002) examined the roles of parental and peer behavioural influences on adolescent substance use using longitudinal data on 1807 students going into the 6th or 7th grade in the United States. They reported that the risk of adolescent substance use was significantly related to higher numbers of parents' and friends' substance use. They also stated that although friends' substance use was a stronger predictor than parents' substance use, parents who did not use substances appeared to act as buffers against the influence of friends who smoked, drank, and used marijuana, effectively influencing the adolescents to avoid substances themselves. This study underscores the important role parents play in adolescent smoking, drinking, and drug use.

Latendresse and colleagues (2008) examined the associations between parental and adolescent alcohol use to determine whether the variables are directly related or indirectly related through parenting practices. They reported that within their sample of 4731 adolescents and their parents, they found parent behaviour to be directly related to adolescent drinking at 14 and 17½ years of age. They also found that parenting practices, particularly monitoring and discipline,

mediated these relationships. The authors concluded that parents' alcohol use behaviour and parenting practices could be targeted in interventions aimed at reducing adolescent alcohol use.

Lac and Crano (2009) did a meta-analytic review of parental monitoring and adolescent marijuana use. They examined 17 studies and reported a "robust" relationship between the two variables. Parental monitoring includes a variety of practices, such as the structuring of activities for the adolescent, and knowledge of the adolescent's whereabouts and friends. The authors concluded that parents play an important role in adolescent marijuana usage and suggested that future studies ought to consider moderators, such as parent-child communication and personality factors. They did not mention the impact of Sensation Seeking in particular, nor did they consider the role of peers in this review.

Taubman-Ben-Ari and colleagues (2005) examined the relationship between adolescent and parent driving practices. Four hundred and seventy-five members of 174 families completed a questionnaire on driving and were scored on four "styles": *reckless and careless*; *anxious*; *angry and hostile*; and *patient and careful*. The researchers reported significant correlations among adolescent and parent driving styles, especially along gender lines. Specifically, for male participants and their fathers, *anxious*, *reckless*, and *careful* styles were positively correlated whereas sons' *reckless* and *angry* styles were negatively correlated with fathers' *careful* style. For female participants and their mothers, *anxious* and *reckless* styles were positively correlated. Furthermore, mothers' *reckless* style was positively associated with daughters' *angry* style whereas mothers' *careful* style was negatively correlated with daughters' *anxious* style. Some cross-gender correlations were reported, as well, indicating sons' *reckless* style was positively related to mothers' *anxious* style and negatively associated with mothers' *careful* style while fathers' *careful* style was positively associated with daughters' *careful* style and negatively

associated with daughters' *reckless* style. The authors concluded that parent and adolescent driving practices appear to be related but do not entirely account for adolescents' driving styles and further research ought to incorporate personality characteristics and/or peer socialization variables.

There are a few studies that have included more than one domain of influence on adolescent health-risk behaviours. Chassin and colleagues (1986) conducted one of the earlier studies of peer and parent influences on adolescent smoking transitions. They used a longitudinal design to assess changes in smoking status in approximately 3000 6th to 11th grade students over a 1-year period. The researchers focused on the groups of "never smokers" and "triers" at Time 1 in order to ascertain the impact of peer and parent variables on smoking initiation by Time 2. Among other predictors, having more friends who smoked led to initiation of smoking for "never smokers" and led to regular smoking for "triers". Parents' smoking was also found to contribute to adolescent smoking initiation but not maintenance of smoking behaviour. The researchers reported gender differences in terms of influences on adolescent smoking—i.e., both peers and parents had more influence on female than on male adolescents. Cross-sectional analyses revealed that peer influence increased with age but longitudinal analyses showed that both peers and parents have a continuing influence on adolescent smoking behaviour.

Kosterman and colleagues (2000) examined parent and peer influences on alcohol and marijuana initiation in a longitudinal sample of 808 adolescents. Participants were interviewed once a year between the ages of 10 and 16 and then once again at age 18 to determine the age at which drinking and drug use began. The authors reported that individuals who had friends who drank alcohol or used marijuana were at a significantly increased risk of starting to use those drugs themselves in adolescence. They also reported that parents appeared to act as buffers

against alcohol initiation by communicating negative attitudes toward adolescent drinking. The researchers concluded that future prevention initiatives ought to include parents, as peers are not the only influence on adolescents. This study revealed that parents can play a critical role in influencing their adolescents' substance use. However, the researchers were looking at initiation patterns (i.e., the first time adolescents try a substance) rather than adolescents' ongoing use of substances. The authors argue that age of initiation predicts later risk of substance abuse but it is important to study the factors that maintain use and not just those that contribute to the commencement of substance use.

Wood and colleagues (2004) examined peer and parent influences on alcohol use in older adolescents. They mailed out questionnaires to 970 adolescents attending university orientation the summer after high school graduation. Follow-up recruitment and elimination of cases with missing data resulted in a total sample of 556 individuals ages 18 to 19. The measures used in this study assessed peer influences, such as offering alcohol, modeling alcohol use, and perceived norms, as well as parental influences, such as monitoring, nurturance, disapproval, and permissiveness of drinking alcohol. The authors reported that not surprisingly, peers exerted a strong influence on adolescents' alcohol consumption. They also noted, however, that parental involvement was associated with less peer influence and less subsequent alcohol use. This finding is consistent with a small body of research that suggests parental disapproval of such behaviours may serve as a protective factor for adolescents. The authors concluded that both peer and parental behaviours and attitudes exert significant influences on late adolescents' drinking behaviours. These results are consistent with the findings of C. Li and colleagues (2002) in a younger population and suggest that the roles of parents and peers are similar at different ages. A strength of this study is that it considered both parent and peer influences through both modeling

and attitudes. However, the participants were recruited from a university orientation meeting, which may have precluded less academically inclined adolescents, who may or may not be at greater risk of engagement in health-risk behaviours such as alcohol abuse.

Researchers have studied various influences on health-risk behaviours in teenagers and adults (Griffin et al., 1999; Jonah, 1997; Kosterman et al., 2000; Sanford, 2001; Zimbardo et al., 1997). Personality factors have been considered (e.g., Clapper et al., 1994), as well as peer and parent modeling factors (e.g., Wood et al., 2004). In the media, and the “war on drugs”, a significant emphasis has been placed on verbal communication of values, particularly from parents to adolescents, and some studies have examined parental attitudes as buffers to health-risk behaviours (e.g., C. Li, Pentz, & Chou, 2002), while others have looked at the impact of peer attitude (Bailey & Hubbard, 1991). To date no study has sought to examine these specific factors (i.e., Sensation Seeking, peer substance use behaviour, parent substance use behaviour, peer anti-substance messages, and parent anti-substance messages) in combination in a population of emerging adults.

Emerging adulthood

In the past, individuals seemed to go from adolescence to adulthood with little (if any) time in between. Adulthood was marked by two critical life achievements—marriage and work. Currently, in Western cultures, there is a lag between adolescence and the realization of relationship and career goals. Young people are delaying marriage (and putting off having families of their own) and are taking longer to do their schooling and find fulfilling careers than did their parents and grandparents (Arnett, 2000, 2004). According to Arnett, this delay has resulted in an in-between developmental phase, which he calls “emerging adulthood”. From approximately 18 years of age through their mid- 20s, individuals are continuing to struggle to

define themselves. This time is characterized by *identity exploration*, *instability*, *self-focus*, *transitions*, and *a sense of possibilities* (Arnett, 2004). The primary goal of this period is to achieve self-sufficiency. Once the individual has done so, then adulthood has been attained (Arnett, 2000). Historically, adolescence was believed to be the period where individuals experimented with health-risk behaviours (Kail, Cavanaugh, & Ateah, 2006); however, it appears that as individuals enter emerging adulthood, a period defined by the twin positions of not having adult responsibilities while not being monitored as closely as adolescents, they continue to engage in such behaviours (Arnett, 2000, 2005; Rolison & Scherman, 2003; Windle, 2003).

During emerging adulthood, individuals may explore their options in both the dating and schooling realms. As part of his/her *identity exploration*, the emerging adult may date different people to try to determine a suitable mate. Also, he/she may try out different classes, change programs, or experiment with various jobs to figure out what kind of career to pursue. There tends to be a great deal of *instability* during this time due to changes in plans for love and education. For example, the emerging adult may make changes in living arrangements as a result of a break-up or in order to attend a new school. The emerging adult may be *self-focused* as he/she is free to make his/her own choices, whereas a teenager must obey parents and teachers and an adult must be held accountable to a spouse, child, and/or boss. The *transition* to adulthood is often gradual as the emerging adult accepts responsibility for him/herself, makes independent decisions, and becomes financially independent. As this happens, many opportunities present for the future and the emerging adult may feel as though all of his/her hopes may one day be fulfilled (*age of possibilities*) (Arnett, 2004).

Arnett (2005) has theorized as to why emerging adults use substances on the basis of the aforementioned features of this period. Firstly, he suggests that as emerging adults engage in *identity exploration*, they may purposefully seek out a wide range of experiences prior to embracing adult roles. He points out the association between the Sensation Seeking subscale, Experience Seeking, and this tendency to want to try new things during emerging adulthood. Alternatively, he suggests that using substances may be a way to cope with identity confusion during this stage of life. Arnett postulates that the multiple changes in housing, jobs, and relationships during this time period may further contribute to substance use as such *instability* may cause sadness and anxiety, which in turn, may lead to self-medication. Substance use may also be prevalent in emerging adulthood due to the fact that individuals at this stage do not have to worry about disapproval from peers because they are more likely to make decisions without checking in with others (*self-focus*) and are also likely to choose peers who share similar interests. Since friends are central in emerging adults' lives, they may provide the context for substance use. Emerging adults are in *transition* from adolescence to adulthood and may not be committed to adult responsibilities yet. Instead, they may relish the freedom they have to do things that will later be viewed as unacceptable, such as use substances. Finally, Arnett notes that emerging adults have difficulty acknowledging potential costs of substance use because they have an inflated *sense of possibilities* and hope for the future, which renders them myopic (i.e., unable to see long term consequences) (Arnett, 2005).

Much of the research on adolescent health-risk behaviours focuses on high school students (Rolison & Scherman, 2003). The literature neglects the period between adolescence and adulthood, known as emerging adulthood (Arnett, 2000), which reflects a distinct stage of life with features that render it more likely for individuals to engage in health-risk behaviours

(Arnett, 2005). The transition from high school to college often involves initiation and exposure to alcohol, cigarettes, and drugs, and as many adolescents get their drivers' licenses around that age, college presents a time of increased risk of drinking and driving (Windle, 2003), and other reckless driving practices (Kelly et al., 2004). The current study examines health-risk behaviours in a Canadian population attending Collèges d'Enseignement Général Et Professionnel (CEGEPs) and as such, also contributes to the literature on emerging adults.

Research on emerging adulthood and health-risk behaviours

Much of the literature in the area of health-risk behaviours focuses on teenagers between 12 and 17 years of age, however, some individuals between the ages of 18 and 25 continue to engage in such behaviours (Teese & Bradley, 2008). In the past, researchers assumed that health-risk behaviours would drop off as adolescents become adults but there is evidence to suggest that the delay in the attainment of adult roles has resulted in a developmental period that lends itself to experimentation, namely emerging adulthood (Arnett, 2004). A review of the few studies that have looked at correlates of health-risk behaviours in this population follows.

Bradley and Wildman (2002) examined risk and reckless behaviours in a sample of 375 emerging adults. Hierarchical multiple regression analyses were performed to determine the impact of Sensation Seeking and peer pressure on behaviours such as unsafe sexual practices, substance use, and dangerous driving. Consistent with past research, Sensation Seeking was found to be related to all of the risk and reckless behaviours in this study. Peer pressure was also found to be related to reckless behaviours, above and beyond Sensation Seeking, but not to risk behaviours. Gender, age, and education were predictive of reckless behaviours, as well, specifically being male, older, and less educated increased the likelihood of engaging in such behaviour. The authors concluded that peer pressure is the most powerful predictor of

recklessness in emerging adults and ought to be the focus of intervention efforts. This study did not take familial contextual variables into account.

Teese and Bradley (2008) examined the impact of predictor variables from three psychosocial domains on reckless behaviour in 208 emerging adults. Participants completed a battery of tests including the Reckless Behaviour Questionnaire (RBQ) and the Marlowe-Crowne Social Desirability Scale (SDS). The researchers found that impulsivity, peer pressure, perceived risks, and perceived benefits were associated with substance use, reckless driving, and reckless sexual behaviour. According to the authors, peer pressure was the strongest predictor of substance use but did not uniquely contribute to reckless driving. They also found that individuals in romantic relationships were more likely to engage in reckless behaviours (specifically, substance use) than were their single counterparts. In the Teese and Bradley study (2008), impulsivity was chosen to represent the contribution of personality to the psychosocial model of reckless behaviours because of previous links to reckless behaviours in the literature and because it incorporated aspects of Sensation Seeking (namely, Disinhibition characteristics) that have been found to predict reckless behaviours. The researchers reported that their impulsivity measure was not highly reliable and it appears as though a measure of Disinhibition might have been a better predictor. Also, the researchers focused on peer influences despite acknowledging that there are numerous social variables at play in reckless behaviours.

The current study, while sharing the same goal of identifying the strongest contributing factors among a combination of predictors for health-risk behaviours in emerging adults, differs significantly from the Teese and Bradley (2008) study. Sensation Seeking is assessed rather than impulsivity, and in lieu of cognitive factors, social influence was expanded to include not only peer but also parent predictors of health-risk behaviours.

In cross-sectional studies, college students and emerging adults have been found to be particularly at risk for engaging in health-risk behaviours (Arnett, 2000, 2005; Rolison & Scherman, 2003; Windle, 2003). Longitudinal research also demonstrates that substance use tends to increase between 15 and 18 years of age with an even greater increased consistency of use between 18 and 21 years of age (McGee, Williams, Poulton, & Moffitt, 2000). According to McGee and colleagues (2000), heightened risk-taking appears to be linked to transition periods in development, such as pursuing higher education after high school, shifting from unemployment to employment, changing from living at home to living independently, and alterations in romantic relationships and social roles. These transitions often occur simultaneously and over a brief period of time (Hurrelmann & Richter, 2006) and commonly take place during the emerging adulthood phase. Despite a sound theoretical base, relatively few studies have examined health-risk behaviours in emerging adults (Arnett, 2000) and so a secondary goal of this study was to contribute to the emerging adulthood literature.

It should be noted that although approximately 7% of the current sample is 17 years old, one can argue that they ought to be considered at the earliest stages of emerging adulthood. In Quebec, students graduate from high school after grade 11, when they are usually 16 or 17 years of age. All of the 17 year old participants in the current study were attending post-secondary schools and would meet Arnett's five criteria for emerging adulthood: 1) CEGEP allows these youth the freedom to explore educational and career options unlike the standardized high school curriculum (*identity exploration*), 2) Dating various people and changing programs often occur in CEGEP settings so it could be argued that it is also an unstable time (*instability*) despite the fact that these students may not have left home yet. Arnett himself states that "there is no reason why [the emerging adult criteria] could not apply to young people who live at home" (Arnett,

2004, p. 55), 3) CEGEP students are encouraged to make their own choices and are not typically as closely monitored by parents and teachers as are adolescents (*self-focus*), 4) These youth are also slowly making their way toward adulthood by taking more responsibility for their actions and making more independent choices (*transition*), and 5) One can argue that a world of possibilities lies before these youth because they are just beginning to figure out what their hopes and dreams are for the future (*age of possibilities*). Moreover, Arnett acknowledges that the age range for emerging adulthood is flexible as he states that it “is the period from (roughly) age 18 to the mid-twenties” (Arnett, 2004, p. 9).

Contributions of the current study

The main goals of this study were to examine three critical domains of influence (personality, peer, and parent) together to provide greater context for health-risk behaviours, to identify the strongest predictors of each health-risk behaviour to improve targeted intervention, and to compare 3 groups (never tried substances, tried substances in the past, and still use substances) to learn more about the differences in substance use experimentation in a population of emerging adults. As stated previously, this project addresses 2 research priorities identified by the NAHIC: 1) examining “multiple influence models” for intervention purposes, and 2) studying correlates that differentiate between “experimentation” and “damaging patterns of risk behaviour” (Millstein et al., 1999). While this study is cross-sectional in nature (and therefore limited in terms of establishing causality), the groups that are tested allow for comparisons to be made between emerging adults who use substances now or did in the past with those who never experimented. This study succeeds in elucidating the relationships between personality variables, peer behaviour and message variables, and parent behaviour and message variables, and each health-risk behaviour outcome variable in a Canadian population of emerging adults.

Control Variables

Gender

Researchers have consistently found male participants to be more likely than their female counterparts to engage in health-risk behaviours (Arnett, 1992a; Arnett et al., 1997; CCSA, 2007; Kelly et al., 2004; Teese & Bradley, 2008), and to score highly on Sensation Seeking (Arnett, 1992a, Arnett et al., 1997; Hoyle et al., 2002; Jonah, 1997; Roberti, 2004). The same patterns of gender differences were expected in this study, as well. Specifically, it was hypothesized that males would be more likely than females to engage in global reckless behaviour, to drive recklessly, to smoke, to get drunk, and to use marijuana. It was also hypothesized that male participants would be more likely than female ones to have a propensity for Disinhibition, Experience Seeking, Boredom Susceptibility, and Thrill and Adventure Seeking. For this reason, gender was included as a control variable.

School

CEGEP institutions are privately or publicly funded and have varying requirements for entry into their schools. Marianopolis College requires students to pay tuition whereas Dawson College does not, and Marianopolis requires students to have a higher grade point average on admission than does Dawson. Since research has shown that individuals value something more if they have to pay for it (Thaler, 1980), and academic achievement has been negatively correlated with reckless behaviors in the past (Murphey, Lamonda, Carney, & Duncan, 2004), it was expected that Marianopolis students would be less likely to engage in such behaviors than their Dawson counterparts. In other words, it was hypothesized that Dawson students would be more likely than Marianopolis students to engage in reckless behavior overall, to drive recklessly, to

smoke, to get drunk, and to use marijuana. For this reason, school was included as a control variable.

Hypotheses

The hypotheses in the study were as follows:

H₁ Interrelationships among health-risk behaviours

Jessor recognized that problem behaviours tend to be interrelated and he theorized that these behaviors, which cluster together, may in fact represent a syndrome rather than separately occurring conditions. If an individual shows disregard for his/her safety in one area of life, he/she will likely demonstrate similar disregard in another area (Jessor, 1992). This notion has been upheld by research—i.e., alcohol use has been associated with adolescent smoking, drug use, and reckless driving (Windle, 2003), adolescent tobacco use has been correlated with alcohol and cannabis use (Lynskey et al., 1998), and health-risk behaviours have been found to be related (Donovan, 1993; Teese & Bradley, 2008). It was therefore hypothesized that, in the current study, emerging adults who engaged in one health-risk behaviour would be more likely to engage in other such behaviours (i.e., health-risk behaviours would be correlated).

H₂ Predictors of Cigarette Smoking

It was predicted that personality, peer behaviour, and parent behaviour would all be positively associated with Smoking Cigarettes and that peer messages and parent messages would be negatively associated with Smoking Cigarettes (e.g., Frankenberger, 2004; Kobus, 2003; C. Li et al., 2002). Peer factors were predicted to be the strongest determinants of Smoking Cigarettes (Chassin et al., 1986) and were expected to differentiate between those who never tried smoking, those who tried and stopped, and those who continue to smoke at the start of emerging adulthood.

H₃ Predictors of Marijuana Usage

It was predicted that personality, peer behaviour, and parent behaviour would all be positively associated with Marijuana Usage and that peer messages and parent messages would be negatively associated with Marijuana Usage (e.g., Bailey & Hubbard, 1991; Lac & Crano, 2009; Wagner, 2001). Peer factors were predicted to be the strongest determinants of Marijuana Usage (Kosterman et al., 2000) and were expected to differentiate between those who never tried marijuana, those who tried and stopped, and those who continue to use marijuana at the start of emerging adulthood.

H₄ Predictors of Alcohol Inebriation

It was predicted that personality, peer behaviour, and parent behaviour would all be positively associated with Alcohol Inebriation and that peer messages and parent messages would be negatively associated with Alcohol Inebriation (e.g., Clapper et al., 1994; F. Li, Barrera, Hops, & Fisher, 2002; Latendresse et al., 2008). Parent factors were predicted to be the strongest determinants of Alcohol Inebriation (Wood et al., 2004) and were expected to differentiate between those who have never been drunk, those who have been drunk in the past, and those who continue to get drunk at the start of emerging adulthood.

H₅ Predictors of Reckless Driving

It was predicted that personality, peer behaviour, and parent behaviour would all be positively associated with Reckless Driving and that peer messages and parent messages would be negatively associated with Reckless Driving (e.g., Allen & Brown, 2008; Jonah, 1997; Taubman-Ben-Ari, 2005). Parent factors were predicted to be the strongest determinants of Reckless Driving (Shope, Waller, Raghunathan, & Patil, 2001).

H₆ Predictors of Global Reckless Behaviour

It was predicted that personality, peer behaviour, and parent behaviour would all be positively associated with global reckless behaviour and that peer messages and parent messages would be negatively associated with global reckless behaviour (e.g., Bradley & Wildman, 2002; C. Li et al., 2002; Wagner et al., 2001). Personality factors were expected to be the strongest determinants of global reckless behaviour (Carlson, 2003).

Method

Participants

For the present study, students between the ages of 17 and 21 (mean 18.34, standard deviation 0.67) were recruited from 2 English CEGEPs in the Montreal area, Marianopolis College and Dawson College. Convenience and quota sampling were used. Marianopolis College was selected to represent the private sector and Dawson College was selected to represent the public sector. The sample consisted of 203 participants (107 male, 96 female). There were 68 females and 56 males from Marianopolis College as compared to 28 females and 51 males from Dawson College. One hundred and fifty-three participants had a driver's license (75% of the sample). The sample size was estimated for a medium effect size, with alpha set at .01 and power of .80 (Cohen, 1992; Tabachnick & Fidell, 2001).

Procedure

Participants were recruited in classrooms (convenience sampling) and via word of mouth (snowball sampling). At Marianopolis College, the researcher went into Psychology, English, and Sociology classes to recruit participants. At Dawson College, the researcher's assistant set up a booth in the school cafeteria to recruit participants. To ensure anonymity and confidentiality, participants were instructed not to put their names on the questionnaires and were informed that the specific information they provided would not be shared with their parents or anyone from their school. Participants were also told that they may choose at any point not to answer any of the questions. The questionnaires took approximately one hour to complete. The information letter given to the participants included telephone numbers for various national and Quebec hotlines in the eventuality a participant wished to speak with someone regarding changing their reckless behaviour (e.g., quitting smoking) after completing the questionnaires. A

copy of the information letter can be found in Appendix G. Dawson College participants were additionally asked to sign a letter of consent in duplicate (one copy of which they kept and the other remained with the researcher but separate from the questionnaires) as per directions from the Dawson College Ethics Committee. A copy of the informed consent form can be found in Appendix H. Upon completion of the questionnaires, each participant was given a \$5.00 gift certificate to the coffee shop, Second Cup, as compensation for their time.

Measures

Participants were asked to complete a 6-part questionnaire battery. Part I consisted of demographic information questions, such as age, gender, school, program, whether or not the student was expected to graduate this year, age at which he/she started smoking, drinking, and/or doing drugs, and whether or not the participant had a driver's license and had regular access to a car. A copy of the Demographic Information section can be found in Appendix A.

Part II consisted of a self-report measure on reckless behaviours called The Reckless Behaviour Questionnaire (RBQ) (Shaw, Wagner, Arnett, & Aber, 1992). The RBQ is a 10-item questionnaire developed by Arnett (1989) that assesses the frequency of adolescent participation in reckless behaviours, such as substance use, dangerous driving practices, unsafe sex, theft, and vandalism. Participants were instructed to read each statement and to indicate whether they took part in each activity 0 times, once, 2-5 times, 6-10 times, or more than 10 times during the past year. Responses were scored on a 5-point scale, yielding one overall score. Strong test-retest reliability of the RBQ with a college sample has been reported ($r = 0.80$) and the RBQ's construct validity, as determined by a discriminant function analysis of high versus low risk-taking status, has been demonstrated to be good (risk status was classified with 85% accuracy for college student participants) (Shaw et al., 1992). In the current study, the RBQ was found to have

moderate internal reliability (Cronbach's $\alpha = 0.76$) and the total score was used in the analyses. A copy of The Reckless Behaviour Questionnaire can be found in Appendix B.

Part III consisted of a self-report measure on substance use called The Health Behaviour Survey (HBS). The HBS is a 100-item questionnaire (3 demographics questions pertaining to schooling were discarded from the original survey and replaced with 3 items pertaining to anti-substance use messages) assessing attitudes, behaviours, and influences on adolescent substance use (C. Li et al., 2002). Each question has a series of forced choice responses corresponding to numbers in ascending order. Participants were instructed to circle the number next to their response. The HBS contains 3 items pertaining to substance use for parents and peers (as reported by the emerging adult) and 6 items pertaining to participant substance use, that were used in the current study. The scores for cigarette smoking, alcohol inebriation, and marijuana usage, as well as anti-substance use messages, were converted into dichotomous variables (deemed necessary as a result of too few participants in each category) and then summed to create the variables Parent Behaviour, Peer Behaviour, Parent Messages, and Peer Messages. The original parent behaviour items included "Of the 2 adults who are the most important in your life, how many do you think smoke cigarettes/drink alcohol/use marijuana?". The original peer behaviour items included "How many of your close friends smoke cigarettes?", "How many of your close friends drink alcohol (beer, wine, or liquor)?", and "How many of your close friends use marijuana?". The original anti-substance use message items were phrased as follows: "Has your [mother/father/best friend] ever given you any of the following messages: none; don't drink alcohol; don't smoke; don't do drugs; don't drink and don't smoke; don't drink and don't do drugs; don't smoke and don't do drugs; don't smoke, don't drink, and don't do drugs".

The emerging adult items included “How many cigarettes have you smoked in your whole life?”, “How many cigarettes have you smoked in the last month (30 days)?”, “Have you ever been drunk?”, “In the last month (30 days), how many times have you been drunk?”, “How many times have you used marijuana in your whole life?”, and “How many times have you used marijuana in the last month (30 days)?”. Three groups were identified from these items, i.e., emerging adults who “Never tried” substances, those who “Tried but stopped”, and those who “Currently use” each of the three substances (cigarettes, alcohol, and marijuana). Permission to utilize this questionnaire was obtained. A copy of The Health Behaviour Survey can be found in Appendix C.

Part IV consisted of a self-report measure on reckless driving behaviour created by Gibbons and Gerrard (1995) for their study on young adults’ health risk behaviour. The 5-item survey assesses behaviours such as speeding, disobeying traffic signals and signs, driving while under the influence of alcohol or drugs, “horsing around” (e.g., drag racing), and driving without a seatbelt. Participants were asked to respond to each question using a Likert-type scale indicating how frequently they engage in such behaviours. This measure yielded an overall score for reckless driving behaviour with higher scores indicating higher levels of recklessness. Reliability for the reckless driving scale has been found to be moderate (Cronbach’s α values ranging from 0.67 to 0.68) (Gibbons & Gerrard, 1995). In the current study, the Reckless Driving Measure (RDM) was found to have moderate reliability (Cronbach’s $\alpha = 0.77$) and the total score was used in the analyses. A copy of the Reckless Driving Measure can be found in Appendix D.

Part V consisted of a self-report measure of Sensation Seeking called the Sensation Seeking Scale—Form V (SSS-V). This measure provided information specific to the adolescent that was useful in parsing out the individual’s contribution from that of parents and peers. The

SSS-V is a questionnaire that contains 40 items that assess 4 subscales: Experience Seeking, Boredom Susceptibility, Thrill and Adventure Seeking, and Disinhibition. Participants were instructed to select 1 of 2 statements which better described them. Internal reliabilities for the total scale have been found to range from 0.83 to 0.82 (Zuckerman, 1978 cited in Shaw et al., 1992) and test-retest reliability has been found to be high ($r = 0.94$) (Shaw et al., 1992). In the current study, the SSS-V was found to have moderate internal reliability (Cronbach's $\alpha = 0.80$), with alphas ranging from 0.50 to 0.77 on the subscales. A copy of the Sensation Seeking Scale—Form V can be found in Appendix E.

Part VI consisted of a social desirability measure called the Marlowe-Crowne Social Desirability Scale (SDS). This 33-item questionnaire assesses the tendency to respond to items in a socially acceptable manner in order to obtain approval. Participants were asked to respond True or False to each item. Internal consistency for this measure has been found to be high (Cronbach's $\alpha = 0.88$) and test-retest reliability also has been reported as high ($r = 0.89$) (Barger, 2002). In the current study, the SDS was found to have very low consistency (Cronbach's $\alpha = 0.37$), which may be due to the fact that the questionnaire was last in the package and the participants were tired. As a result, this questionnaire was not included in the analyses. A copy of the Marlowe-Crowne Social Desirability Scale can be found in Appendix F.

Statistics

Hierarchical linear and logistic regression analyses were used to determine the relationships between health-risk behaviours, Sensation Seeking, parental influences, and peer influences in emerging adults. Classification tables were interpreted. Due to the large number of tests performed, a more conservative alpha of .01 was utilized. In instances where significance was greater than .01 but less than .05, $p > .01$ was indicated; otherwise $p > .05$ was reported. To

test the aforementioned hypotheses, the following predictor variables were employed: participant total propensity for Sensation Seeking (including the 4 dimensions of Thrill and Adventure Seeking, Disinhibition, Boredom Susceptibility, and Experience Seeking), peer behaviour (whether or not peers smoke cigarettes, drink alcohol, or use marijuana), parent behaviour (whether or not at least 1 of the 2 most important adults in the participant's life smokes cigarettes, drinks alcohol, or uses marijuana), peer messages (anti-smoking, anti-drinking and anti-drug), and parental messages (anti-smoking, anti-drinking, and anti-drug). The dependent variables included participants' global reckless behaviour, overall reckless driving behaviour, and participants' cigarette smoking, alcohol inebriation, and marijuana usage over their lifetime. According to Cohen, Cohen, West, and Aiken (2003), hierarchical regressions must be ordered logically with confounding variables entered first followed by variables that have higher causal priority. As such, the independent variables were entered in the following order for the hierarchical analyses: Gender and School (control variables) were entered first, then Total Sensation Seeking was entered (a personality variable that may be causally related to the peer variables—e.g., Sensation Seekers may choose similar friends), and lastly Peer Behaviour, Parent Behaviour, Peer Messages, and Parent Messages were entered together (social variables).

Power and sample size

For correlations, a sample size of 125 is sufficient to detect a medium effect ($r = .30$) with $\alpha = .01$ and $\beta = .20$ (power = .80). For hierarchical linear and logistic regressions, a sample size of 141 is sufficient to detect a moderate effect ($sr = .15$) with $\alpha = .01$ and $\beta = .20$ and 7 independent variables (Cohen, 1988; 1992). All t-tests are performed two-tailed unless otherwise indicated.

Results

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) software, version 15. The data were screened for missing values, univariate and multivariate outliers, and normality of distributions. Less than 1% of the data were missing and the missing data were distributed randomly throughout the dataset. Composite scores were calculated by prorating missing values if these constituted less than ten percent of the data for a participant. This system produced null composite score values on 4-5 scales for two participants, who were ultimately excluded from analyses because they were missing too many data points. Two other participants were excluded due to missing data on Gender. The remaining missing data at the composite-score level were estimated using single imputation (Expectation Maximization algorithm in SPSS 15). Tests of normality indicated some skewed distributions (i.e., the RBQ and RDM total scores, and the Boredom Susceptibility SSS-V subscale score) that were adjusted using logarithmic transformations. Visual inspection of the histograms failed to reveal univariate outliers, as did application of a z-score cutoff (3.00). Finally, Mahalanobis distance tests did not detect any multivariate outliers at the .001 alpha level. The SDS was excluded from all analyses due to its low internal consistency in the current study. Correlation matrices for all IVs and each DV can be found in Appendix I.

Descriptive Statistics

The final sample consisted of 203 participants (107 males, 96 females). There were 68 females and 56 males from Marianopolis College as compared to 28 females and 51 males from Dawson College. The mean age of participants was 18.32 years ($SD = 0.67$) with a range of 17 to 21 years. Frequencies, means, and standard deviations for significant descriptive, predictor, and outcome variables are presented in Table 7.

Control Variables

Gender

Independent samples t tests revealed significant differences between males and females on overall reckless behavior, $t(201) = 3.67$, $p < .001$, and reckless driving, $t(151) = 3.28$, $p < .01$. In both cases, males were more likely than females to behave recklessly, $r(202) = -.25$, $p < .001$ and $r(152) = -.26$, $p < .01$, respectively. Chi-square tests of independence, however, revealed no significant differences between the two genders on cigarette smoking, $\chi^2(2, N = 203) = 2.05$, $p > .05$, alcohol inebriation, $\chi^2(2, N = 203) = .02$, $p > .05$, or marijuana usage, $\chi^2(2, N = 203) = 3.60$, $p > .05$.

Males and females also differed significantly on 2 of the 4 Sensation Seeking subscales, Disinhibition, $t(201) = 3.64$, $p < .001$, and Boredom Susceptibility, $t(201) = 3.24$, $p < .01$. In both cases, males were more likely than females to be higher on Sensation Seeking, $r(202) = -.25$, $p < .001$ and $r(202) = -.22$, $p < .01$, respectively. Experience Seeking, $t(201) = .91$, $p > .05$, and Thrill and Adventure Seeking, $t(201) = .84$, $p > .05$, showed no significant differences.

School

Independent samples t tests revealed significant differences between Marianopolis and Dawson students, controlling for gender, on global reckless behavior, $t(201) = -2.58$, $p = .01$, but not on reckless driving, $t(151) = -0.05$, $p > .05$. Dawson students were more likely than Marianopolis students to behave recklessly overall, $r(202) = .18$, $p = .01$. Chi-square tests of independence revealed significant differences between the two schools on marijuana usage, $\chi^2(2, N = 203) = 10.95$, $p < .01$ but no significant differences were found between the schools on cigarette smoking, $\chi^2(2, N = 203) = 0.35$, $p > .05$ and alcohol inebriation, $\chi^2(2, N = 203) = 5.24$,

$p > .05$. Participants who attended Dawson College were more likely to use marijuana than were their Marianopolis counterparts, $r(202) = .23, p < .01$.

Testing Hypotheses

H₁ Interrelationships among health-risk behaviours

To test the hypothesis that reckless behaviors are interrelated, a correlation matrix was run for the dependent variables (r ranging from .31 to .59). Please see Table 1 for the correlations.

H₂ Predictors of Cigarette Smoking

Multinomial logistic regression analysis (MLR) is appropriate for testing models with a dependent variable that has three (or more) categories with no order (nominal) (Hosmer & Lemeshow, 2000; Menard, 2002). As with all hierarchical analyses, in hierarchical multinomial logistic regression (HMLR), the researcher decides on the order to enter the predictor variables (Tabachnick & Fidell, 2001). One outcome category is designated to be the reference outcome (2001; Hosmer & Lemeshow, 2000; Menard, 2002). Each equation (model) predicts the probability that a case is in a particular category. The number of models is equal to the number of categories minus one (so three categories will produce two models) (Tabachnick & Fidell, 2001). When interpreting HMLRs, the first step is to compare the constant-only model to the model that includes the predictor variables. The difference between these models is called Model Chi-Square. If it is significant, then the independent variables, as a group, contribute to the prediction of the outcome. Classification of cases displays the model's ability to accurately predict outcome membership. The next step is to assess the contribution of each individual independent variable to the model. This can be done by examining the Wald statistic or the likelihood ratio test. According to Tabachnick and Fidell (2001), the latter is "considered

superior” to the former. The likelihood ratio test calculates the decrease in model fit when each independent variable is removed from the model (Chi-Square to Remove). Group differences for the individual significant predictor(s) can be calculated using proportions (for categorical variables) and means (for continuous predictors). The final step is to examine the odds ratio, which shows the strength of the independent variable, with values farther from 1 indicating greater predictive influence (Tabachnick & Fidell, 2001).

A hierarchical multinomial logistic regression analysis was performed through SPSS NOMREG to assess prediction of membership in one of three smoking status groups (Never Smoked, Tried Smoking, and Current Smoker), first on the basis of two demographic variables, followed by the addition of one personality predictor, and then the addition of four social predictors. Demographic predictors were Gender (male or female), and School (Marianopolis or Dawson College). Personality predictor was Total Sensation Seeking. Social predictors were Peer Behaviour, Parent Behaviour, Peer Messages, and Parent Messages.

Comparison of log-likelihood ratios (see Table 2.0) for models with and without the personality variable did not show reliable improvement with the addition of the Sensation Seeking predictor, $\chi^2(6, N = 203) = 12.08, p > .01$. However, comparison of log-likelihood ratios for models with and without social variables did show reliable improvement with the addition of the social predictors, $\chi^2(8, N = 203) = 19.39, p < .01$. On the basis of demographic and personality variables alone, correct classification rates were 89% for Never Smoked, 0% for Tried Smoking, and 37% for Current Smoker; the overall correct classification rate was 48%. With the addition of the four social predictors, the overall correct classification rate improved to 50% and the group rates changed to 71%, 17%, and 56% respectively. Cases were mostly classified into the Never Smoked group.

One social variable reliably improved prediction, $p < .01$. Peer Behaviour was the strongest predictor of cigarette smoking. Mean group differences in Peer Behaviour revealed Current Smokers had peers who used more substances on average (mean = 2.80) as compared to participants in the Never Smoked (mean = 2.11) and Tried Smoking (mean = 2.32) groups. The odds ratio of 2.41 revealed a significant increase in likelihood of being in the Current Smoker category versus the Never Smoked category on the basis of a one unit change in Peer Behaviour.

Table 2.0 shows Chi-Square to Remove for Step 3 and Model Chi-Squares for all three steps of the regression. Table 2.1 shows the regression coefficients, Wald statistics, and odds ratios for each predictor at all three steps for the outcome category Tried Smoking using the reference category Never Smoked. (Note that there were no significant findings for this comparison.) Table 2.2 shows the regression coefficients, Wald statistics, and odds ratios for each predictor at all three steps for the outcome category Current Smoker using the reference category Never Smoked.

H₃ Predictors of Marijuana Usage

A hierarchical multinomial logistic regression analysis was performed through SPSS NOMREG to assess prediction of membership in one of three marijuana use groups (Never Used, Tried Marijuana, and Current Marijuana User), first on the basis of two demographic variables, followed by the addition of one personality predictor, and then the addition of four social predictors. Demographic predictors were Gender (male or female), and School (Marianopolis or Dawson College). Personality predictor was Total Sensation Seeking. Social predictors were Peer Behaviour, Parent Behaviour, Peer Messages, and Parent Messages.

Comparison of log-likelihood ratios (see Table 3.0) for models with and without the personality variable showed reliable improvement with the addition of the Sensation Seeking

predictor, $\chi^2 (2, N = 203) = 30.17, p < .01$. On the basis of demographic variables alone, correct classification rates were 70% for Never Used, 20% for Tried Marijuana, and 40% for Current Marijuana User; the overall correct classification rate was 48%. On the basis of demographic and personality variables, correct classification rates changed to 83% for Never Used, 20% for Tried Marijuana, and 46% for Current Marijuana User; the overall correct classification rate was 55%. This model improved further with the addition of social predictors, $\chi^2 (8, N = 203) = 29.02, p < .01$. With the addition of four social predictors, the overall correct classification rate improved to 60% and the group rates changed to 76%, 42%, and 52% respectively. Cases were mostly classified into the Never Used group.

One demographic variable, one personality variable, and one social variable reliably improved prediction, $p < .01$. School, Total Sensation Seeking, and Peer Behaviour were strong predictors of marijuana usage. Marianopolis students were less likely to be current marijuana users (16%) than were Dawson students (35%). Marianopolis students were also more likely to have never used marijuana (53%) than their counterparts at Dawson College (35%). Mean group differences in Sensation Seeking and Peer Behaviour revealed Current Marijuana Users had slightly more elevated levels of Sensation Seeking (mean = 22.93) than did those in the Never Used (mean = 17.57) and Tried Marijuana (mean = 20.49) groups. Also, Current Marijuana Users had peers who used more substances on average (mean = 2.90) as compared to participants in the two other groups (mean = 1.90 and 2.64, respectively). The odds ratios of 2.13 and 3.28 revealed significant increases in likelihood of being in the Tried Marijuana category and Current Marijuana User category, respectively, versus the Never Used category on the basis of a one unit change in Peer Behaviour. Also, the odds ratios of 1.15 for Total Sensation Seeking revealed a significant increase in likelihood of being in the Current Marijuana User category versus the

Never Used category on the basis of a one unit change in Sensation Seeking Total score. Finally, the odds ratio of 0.26 for School revealed a significant decrease in likelihood of being in the Current Marijuana User category versus the Never Used category.

Table 3.0 shows Chi-Square to Remove for Step 3 and Model Chi-Squares for all three steps of the regression. Table 3.1 shows the relationship between marijuana usage and the significant demographic categorical predictor (School). Table 3.2 shows the regression coefficients, Wald statistics, and odds ratios for each predictor at all three steps for the outcome category Tried Marijuana using the reference category Never Used. Table 3.3 shows the regression coefficients, Wald statistics, and odds ratios for each predictor at all three steps for the outcome category Current Marijuana User using the reference category Never Used.

H₄ Predictors of Alcohol Inebriation

A hierarchical multinomial logistic regression analysis was performed through SPSS NOMREG to assess prediction of membership in one of three alcohol inebriation groups (Never Been Drunk, Been Drunk, and Currently Get Drunk), first on the basis of two demographic variables, followed by the addition of one personality predictor, and then the addition of four social predictors. Demographic predictors were Gender (male or female), and School (Marianopolis or Dawson College). Personality predictor was Total Sensation Seeking. Social predictors were Peer Behaviour, Parent Behaviour, Peer Messages, and Parent Messages.

Comparison of log-likelihood ratios (see Table 4.0) for models with and without the personality variable showed reliable improvement with the addition of the Sensation Seeking predictor, $\chi^2(2, N = 203) = 41.33, p < .01$. On the basis of demographic variables alone, correct classification rates were 0% for Never Been Drunk, 0% for Been Drunk, and 100% for Currently Get Drunk; the overall correct classification rate was 57%. On the basis of demographic and

personality variables, correct classification rates changed to 37% for Never Been Drunk, 0% for Been Drunk, and 90% for Currently Get Drunk; the overall correct classification rate was 59%. This model improved further with the addition of social predictors, $\chi^2(8, N = 203) = 26.23, p < .01$. With the addition of four social predictors, the overall correct classification rate improved to 62% and the group rates changed to 48%, 9%, and 89% respectively. Cases were mostly classified into the Currently Get Drunk group.

Table 4.0 shows the contribution of the individual predictors to the model by comparing models with and without each predictor. One personality variable and one social variable reliably improved prediction, $p < .01$. Total Sensation Seeking and Peer Behaviour were strong predictors of alcohol inebriation.

Mean group differences in Sensation Seeking and Peer Behaviour revealed that participants in the Currently Get Drunk group had slightly more elevated levels of Sensation Seeking (mean = 21.78) than did those in the Never Been Drunk (mean = 15.41) and Been Drunk (mean = 18.36) groups. Also, those in the Currently Get Drunk group had peers who used more substances on average (mean = 2.72) as compared to participants in the two other groups (mean = 1.41 and 2.28, respectively).

Table 4.1 shows the regression coefficients, Wald statistics, and odds ratios for each predictor at all three steps for the outcome category Been Drunk using the reference category Never Been Drunk. The odds ratio of 1.90 revealed a significant increase in likelihood of having been drunk on the basis of a one unit change in Peer Behaviour.

Table 4.2 shows the regression coefficients, Wald statistics, and odds ratios for each predictor at all three steps for the outcome category Currently Get Drunk using the reference category Never Been Drunk. The odds ratios of 1.15 and 2.92 each revealed a significant

increase in likelihood of being in the Currently Get Drunk group on the basis of a one unit change in Sensation Seeking and Peer Behaviour, respectively.

Post-hoc analyses revealed a significant interaction between Sensation Seeking and Peer Behaviour for Alcohol Inebriation. When the interaction was entered, it significantly improved the model, $\chi^2(2, N = 203) = 11.81, p < .01$ and reliably improved prediction.

H₅ Predictors of Reckless Driving

A hierarchical multiple regression analysis was performed using SPSS REGRESSION to determine if social variables improved prediction of reckless driving beyond the contribution of the personality variable, Sensation Seeking, while controlling for demographic variables. After step 1, with Gender and School in the equation, $R^2 = .07, F_{inc}(2, 150) = 5.51, p < .01$. After Step 2, with Total Sensation Seeking added to the equation, $R^2 = .15, F_{inc}(1, 149) = 13.35, p < .001$. After Step 3, with the addition of Peer Behaviour, Parent Behaviour, Peer Messages, and Parent Messages, $R^2 = .21, F_{inc}(4, 145) = 3.08, p = .018$. The personality variable and the social variables reliably improved prediction of reckless driving. R was significantly different from zero at the end of each step. After Step 3, with all IVs in the equation, $R = .46, F(7, 145) = 5.57, p < .001$. Table 5 displays the unstandardized regression coefficients (B) and the standardized regression coefficients (β) for each step of the hierarchical regression. Post-hoc analyses revealed Disinhibition to be the strongest of the Sensation Seeking subscale predictors for reckless driving.

H₆ Predictors of Global Reckless Behaviour

A hierarchical multiple regression analysis was performed using SPSS REGRESSION to determine if social variables improved prediction of global reckless behaviour beyond the contribution of the personality variable, Sensation Seeking, while controlling for demographic

variables. After step 1, with Gender and School in the equation, $\underline{R}^2 = .08$, $\underline{F}_{inc}(2, 200) = 8.78$, $p < .001$. After Step 2, with Total Sensation Seeking added to the equation, $\underline{R}^2 = .28$, $\underline{F}_{inc}(1, 199) = 55.15$, $p < .001$. After Step 3, with the addition of Peer Behaviour, Parent Behaviour, Peer Messages, and Parent Messages, $\underline{R}^2 = .33$, $\underline{F}_{inc}(4, 195) = 3.58$, $p < .01$. The demographic variables, the personality variable, and the social variables all reliably improved prediction of global reckless behaviour. \underline{R} was significantly different from zero at the end of each step. After Step 3, with all IVs in the equation, $\underline{R} = .57$, $\underline{F}(7, 195) = 13.69$, $p < .001$. Table 6 displays the unstandardized regression coefficients (\underline{B}) and the standardized regression coefficients (β) for each step of the hierarchical regression. Post-hoc analyses revealed Disinhibition to be the strongest of the Sensation Seeking subscale predictors for global reckless behaviour.

Discussion

Young people continue to smoke cigarettes, drink to excess, use marijuana, drive recklessly, and engage in other activities that pose a threat to their physical well-being despite having been educated about the potential harmful consequences (Arnett, 1995; Griffin et al., 1999; Jonah, 1997; Kosterman et al., 2000). College students or emerging adults between the ages of 17 and 25 appear to be at the greatest risk for engaging in such behaviour (Arnett, 2005; Rolison & Scherman, 2003; Windle, 2003). Moreover, according to the CCSA (2007), “international comparisons of alcohol and cannabis use by young people indicate that Canada ranks among the leading countries for rates of prevalence and frequency”. The current study examined the relationships among personality, parent, and peer variables, and health-risk behaviours in a sample of Canadian emerging adults. The primary goals of this study were to provide greater context for health-risk behaviours by examining predictors together, to identify the strongest predictor(s) of each behaviour in order to ameliorate tailored interventions, and to compare those who never tried substances, those who tried substances in the past, and those who use substances currently to identify the predictors of variations in experimentation in this population.

Control Variables

Gender

Male and female participants in the sample were compared on measures of health-risk behaviour. Male emerging adults were found to be more likely than their female counterparts to engage in reckless behaviour overall and to drive recklessly. These findings are consistent with this study’s hypotheses and with previous findings in the literature (Arnett et al., 1997; CCSA, 2007; Kelly et al., 2004; Teese & Bradley, 2008). Overall recklessness includes delinquent-type

activities, such as shoplifting, and vandalism. Research has shown that male adolescents are more likely than female adolescents to demonstrate externalizing behaviours, perhaps due to differences in biological vulnerabilities or as a result of socialization processes whereby it is more socially acceptable for boys to “act out” than it is for girls (Wicks-Nelson & Israel, 2000). Also, there is evidence to suggest that males drive more recklessly than females due to greater levels of aggression related to higher levels of testosterone (Arnett, 1995).

A noteworthy finding is that although male participants were found to engage in overall reckless behaviours and reckless driving more so than were the female participants in the study, young men were not found to be more likely to use substances. This finding has growing support in Canadian epidemiological research where it appears that female young adults are increasingly just as likely to use substances as are their male counterparts (CCSA, 2007). Perhaps this is due to the heightening pressures young women feel to pursue academic or career success at the same time as interpersonal or familial success. Studies have shown that women tend to use substances “to improve mood, increase confidence, reduce tension, [and] cope with problems” (Poole & Dell, 2005), which may reflect ways of dealing with the conflicting professional and personal demands of today’s society. Identity exploration has been established as a key feature of emerging adulthood (Arnett, 2005) and it is possible that female CEGEP students, at this stage of life, are using substances to cope with similar academic and personal pressures.

Consistent with this study’s hypotheses and previous findings in the literature (Arnett et al., 1997; Hoyle et al., 2002; Jonah, 1997; Roberti, 2004), it was found that male participants were more likely than female participants to be high on Disinhibition and Boredom Susceptibility, 2 of the 4 Sensation Seeking subscales. Sensation Seeking has been positively correlated with testosterone and norepinephrine (Roberti, 2004), suggesting that hormonal

variations may underlie these gender differences. The findings did not support the hypotheses, however, that males would be more likely than females to have a tendency toward Experience Seeking and Thrill and Adventure Seeking. The previously described increase in substance use in young women may be related to these changes in the gender gap in terms of personality traits. Perhaps it is becoming more socially acceptable for women to endorse these traits and they are, in a manner of speaking, “catching up” to the men in these two domains.

School

Marianopolis and Dawson students were compared on measures of health-risk behaviour and as expected, it was found that Dawson students were more likely than Marianopolis students to engage in reckless behaviour overall and to have tried marijuana. The results did not, however, support the hypotheses that there would be significant differences between the CEGEPs in terms of reckless driving, smoking cigarettes, or alcohol inebriation. This study’s findings might be explained by the fact that Marianopolis College is a private CEGEP that requires students to pay tuition and to have a higher grade point average for admission than does Dawson College. Cognitive dissonance research has demonstrated that individuals value something more when they have paid for it (Thaler, 1980) so it is possible that Marianopolis students value their education more so than Dawson students. As a result, Marianopolis students may be less inclined to engage in health-risk behaviours that might ruin their chances of academic success. Higher academic achievement has been shown to be a buffer against involvement in health-risk behaviours (Jessor, 1987; Murphey et al., 2004). If students do better in school, it is likely that they spend a significant amount of time studying and have less time to do other things, including health-risk activities. It is also probable that academically inclined students have peer groups that value academics above socializing and many health-risk behaviours often, although not

exclusively, occur in social groups (e.g., smoking marijuana). Moreover, students who do well in school are likely concerned about their future and will be unlikely to do anything to jeopardize their prospective careers. Using marijuana or engaging in vandalism or theft may have legal consequences that academically inclined students do not wish to incur. Finally, Marianopolis tends to have smaller classes than Dawson and any absenteeism or change in student demeanor or behaviour would be more likely to be remarked on and met with suitable consequences at Marianopolis. This supports Arnett's theory that in private schools there are stricter rules and the students are more liable to follow them (Arnett, 1992b).

Hypotheses

H₁ Interrelationships among health-risk behaviours

Cigarette smoking, marijuana usage, alcohol inebriation, reckless driving, and global reckless behaviour were found to be interrelated, which is consistent with the study's hypothesis and previous findings in the literature (Jessor, 1992; Lynskey et al., 1998; Teese & Bradley, 2008; Windle, 2003). Participants who had tried smoking were more likely to have been drunk, to have tried marijuana, to engage in reckless behaviour overall, and to drive recklessly. Those who had been drunk were more likely to have tried marijuana, to engage in reckless behaviour overall, and to drive recklessly. Participants who had tried marijuana were more likely to engage in reckless behaviour overall and to drive recklessly and those who engaged in reckless behaviour overall were more likely to drive recklessly.

Evidently, individuals who engaged in one health-risk behaviour were more likely to engage in another, a phenomenon that might be due to a curiosity about new experiences (Frankenberger, 2004) or a tendency toward Sensation Seeking (Donovan, 1993; Griffin et al., 1999). Emerging adults may engage in more health-risk behaviours out of a desire to have as

many novel experiences as possible prior to adulthood when they will have to commit to adult roles and responsibilities (Arnett, 2005). Alternatively, health-risk behaviour in this population could be explained by a propensity for Sensation Seeking (Jonah, 1997) that is no longer mitigated by parents or teachers.

This finding is important as it supports the theory that health-risk behaviours co-occur and tend to exist as a constellation (Jessor, 1992). This collection of behaviours may reflect a more serious underlying lack of concern for health consequences. Research has shown that adolescents tend to feel invulnerable (Frankenberger, 2004; Millstein & Halpern-Felsher, 2002; Rolison & Scherman, 2003; Quadrel, Fischhoff, & Davis, 1993), and it seems that for some, this tendency continues into emerging adulthood, i.e., some emerging adults believe that they will not suffer any dire consequences from their behaviour (Arnett, 2005).

H₂ Predictors of Cigarette Smoking

Sensation Seeking and peer substance use were found to be positively related to cigarette smoking in the current study. There was a notable trend toward parent substance use being positively associated with smoking, as well. These findings are consistent with the study's hypotheses and with previous literature in the area (e.g., Frankenberger, 2004; Kobus, 2003; C. Li et al., 2002).

The hypotheses that peer and parent messages would be negatively associated with cigarette smoking were not supported in the current study. While inconsistent with the literature (Griffin et al., 1999; Kodl & Mermelstein, 2004; Kosterman et al., 2000; Piko, 2001; Wood et al., 2004), the anti-substance use messages from both peers and parents were not significantly related to any of the health-risk behaviour variables in the current study. Rather than discuss this surprising finding for each hypothesis, a brief examination of the possible limitations of the

items will just be considered here. Simply asking whether or not participants were told not to smoke, drink, or do drugs did not provide sufficient evidence to support the hypotheses that peer and parent attitudinal influences would decrease the likelihood of engagement in health-risk behaviours on the part of the emerging adult participants. Perhaps including an aspect to the item that assessed salience of the message would have been helpful, for instance, “how much did you believe the message you received?” or “how important did you think this message was?”. In the future, researchers may wish to include items that assess the value participants place on the messages they receive from their parents and friends.

Peer behaviour was the strongest predictor of cigarette smoking in this study, and successfully differentiated between current smokers, past smokers, and those who never tried smoking. Current smokers were significantly more likely to have peers who used more substances than were participants in the other two smoking groups. Participants with more substance using peers were twice as likely to be in the Current Smoker category than the Never Smoked category. These findings are consistent with the hypothesis and previous literature (Chassin et al., 1986), and one might speculate that parent substance use modeling and Sensation Seeking traits pale in comparison to the strong pull of peer attachment during this transitional period of development. According to Arnett (2004), emerging adulthood is filled with challenges and one’s peer group is a vital source of support during a tumultuous time. Emerging adults may smoke in response to stress and choose friends who smoke, too. Or they may smoke to fit in with peers so that they do not lose out on their support during a difficult time. Either way, these results reveal that smoking intervention initiatives ought to target peer influence to effectively decrease cigarette smoking in emerging adults.

H₃ Predictors of Marijuana Usage

Personality, peer, and parent behaviour were all found to be positively related to marijuana usage. These findings are consistent with previous literature (e.g., Bailey & Hubbard, 1991; Lac & Crano, 2009; Wagner, 2001) and the study's hypotheses.

The hypotheses that peer and parent messages would be negatively associated with marijuana usage were not supported in the current study, likely for the reasons discussed earlier. School was found to predict marijuana usage. Participants who attended Marianopolis were less likely to be Current Marijuana Users and more likely to have Never Tried Marijuana than were those who attended Dawson. These findings once again highlight the differences between private and public schools (Arnett, 1992b).

As expected, peer behaviour was one of the strongest predictors of marijuana usage, and successfully differentiated between current users, past users, and those who never tried marijuana in this study. Sensation Seeking was also found to be positively associated with marijuana usage, and to differentiate between the three groups. Current marijuana users were significantly more likely to have higher levels of Sensation Seeking and to have peers who used more substances than were participants in the other two marijuana usage groups. Participants with more substance using peers were twice as likely to be in the Tried Marijuana category and three times as likely to be in the Current Marijuana User category than the Never Used category. Participants were also 15% more likely to be in the Current Marijuana User category than the Never Used Marijuana category as Sensation Seeking scores increased. These findings coupled with the cigarette smoking findings support Arnett's theory that peers are of utmost importance during this developmental phase (Arnett, 2005). It is critical, then, for interventions to address peer influence in order to decrease marijuana usage in emerging adults. The finding that Sensation

Seeking tendencies matter, as well, has support in the literature (Miles et al., 2001), and suggests that individuals who tend to gravitate toward new and exciting activities may be inclined to start or continue using marijuana during emerging adulthood. For some, this phase may provide the first opportunity to experiment with drugs. This result offers yet another path for intervention and underscores the importance of considering personality factors in the development of health-risk behaviours.

H₄ Predictors of Alcohol Inebriation

Personality, peer, and parent behaviour were all found to be positively related to alcohol inebriation in this study. These findings are consistent with the study's hypotheses and previous literature in the area (e.g., Clapper et al., 1994; F. Li et al., 2002; Latendresse et al., 2008).

As mentioned previously, the hypotheses that peer and parent messages would be negatively associated with alcohol inebriation were not supported in the current study. Another surprising finding was that parent factors, including parent substance use behaviour, were not significantly associated with alcohol inebriation, when controlling for other factors in this study. Results revealed that Sensation Seeking and peer substance use behaviour were the strongest predictors of alcohol inebriation, and successfully differentiated between participants who currently get drunk, those who have in the past, and those who have never been drunk. Individuals who currently get drunk were significantly more likely to have higher levels of Sensation Seeking and to have peers who used more substances than were participants in the other two alcohol inebriation groups. Participants with more substance using peers were almost twice as likely to be in the Been Drunk category and almost three times as likely to be in the Currently Get Drunk category than the Never Been Drunk category. Participants were also 15% more likely to be in the Currently Get Drunk category than the Never Been Drunk category as

Sensation Seeking scores increased. Also, an interesting interaction was found between Sensation Seeking and Peer Behaviour, suggesting that peers may buffer the relationship between Sensation Seeking and Alcohol Inebriation, which may be worthy of follow-up in future research.

The literature on parent substance use appears to be contradictory. Avenevoli and Merikangas' 2003 review of the literature on adolescent smoking revealed "weak and inconsistent associations between parent and adolescent smoking". One study found that *past* parental substance use behaviour was a better indicator of adolescent substance use than was *current* parental substance use behaviour (Bailey et al., 1993), and several studies have found that adult role models are inferior predictors of substance use when compared to peer models (Clapper et al., 1994; Wang, Fitzhugh, Westerfield, & Eddy, 1995). A notable difference between the current study and the one by Latendresse and colleagues (2008) is that they had parents report on their own alcohol consumption whereas in this study emerging adult participants were asked to report on their parents' behaviours. Avenevoli and Merikangas (2003) raised the possibility of individual characteristics, such as biological predispositions, moderating the effects of parent behaviour on adolescent health-risk behaviour. Perhaps some individuals have a genetic predisposition for substance use, which in combination with parental modeling, results in their own substance use; whereas others are turned off by their parents' substance use, having witnessed the repercussions of such behaviour, and would never use substances themselves. These divergent reactions to parental substance use may explain why there were no discernible significant effects for this variable and substance use in emerging adults in the current study.

Additionally, there were a number of flaws in the measure used to assess parental health-risk behaviours in the current study. Firstly, the measure assessed participants' perceptions of their parents' behaviours and some parents may attempt to hide their substance use from their children. Furthermore, the substance use items were worded as "of the 2 most important adults in your life, how many do you think smoke/drink/use marijuana" in order to capture the influence of step-parents or other significant caregivers, and therefore may not solely reflect the behaviour of parents. Lastly, there were no items about parent reckless driving behaviours in this questionnaire. In the future, researchers may wish to include parents in their study and ask them to complete the health-risk behaviour measures themselves to ensure accuracy. Also, researchers ought to inquire about the impact of parental substance use in a direct fashion—e.g., by asking participants how they felt about their parents' cigarette smoking/alcohol consumption/marijuana usage. Furthermore, researchers may wish to be more explicit in their phrasing of items and use the words "mother or father" as opposed to "the 2 most important adults in your life" to eliminate any confusion in responding. Finally, it would be helpful to include questions about parental reckless driving in future studies of this nature.

While this study's findings may differ from past research potentially as a result of the aforementioned limitations, one must also consider the possibility that these results might indeed suggest that Sensation Seeking tendencies and peer substance use might be more closely associated with alcohol inebriation in emerging adulthood than parental substance use. Perhaps the innate need for stimulation is more compelling than the lessons learned from parental actions. Alternatively, the social allure of intoxication may trump years of parental modeling because the emerging adult is seeking to attain adulthood and paradoxically needs to connect with peers in order to become self-sufficient. Once again, it would appear that interventions need to focus on

peer influence, as well as Sensation Seeking tendencies, in order to reduce alcohol inebriation in emerging adults.

H₅ Predictors of Reckless Driving

Personality, peer, and parent behaviour were all found to be positively related to reckless driving, as predicted. These findings are consistent with the study's hypotheses and previous literature in the areas of risky driving and adolescent health-risk behaviours (e.g., Allen & Brown, 2008; Jonah, 1997; Taubman-Ben-Ari, 2005). These findings also extend past research on predictors of risk and recklessness in emerging adults, which as recently as 2009, called for more psychosocial predictors to explain variance in reckless driving in this population (Duangpatra, Bradley, & Glendon, 2009).

Once again, the hypotheses that peer and parent messages would be negatively associated with reckless driving were not supported in the current study. As expected in this study, parent behaviour was the strongest predictor of reckless driving. This finding is particularly interesting as parent reckless driving was not measured directly but rather the measure of parent substance use behaviour was found to be positively related to emerging adults' reckless driving. Not only is this consistent with past research on parents and driving but it also lends support to research on the interrelationships of health-risk behaviours. In this case, parents' health-risk behaviours in one area of life (i.e., substance use) appear to have a cross-over effect onto their children's health-risk behaviour in another area (i.e., reckless driving). What's more, it is likely that parents who use substances tend to drive recklessly, too, thereby serving as models for their adolescent children.

There was also evidence of a trend toward Sensation Seeking being positively associated with reckless driving in this study. High Sensation Seekers have an increased threshold for

stimulation and tend to engage in activities with a component of risk in order to feel aroused (Roberti, 2004). Regular activities seem mundane to these individuals and it makes sense that they would search for something to do that is exciting for them. Moreover, emerging adulthood is a time of exploration with increased opportunity and access to these types of activities without parental monitoring (Arnett, 2005). Emerging adults may learn that driving recklessly is a more socially acceptable way of obtaining a high level of stimulation. Also, it might be easier to gain access to a car than to an illicit drug.

H₆ Predictors of Global Reckless Behaviour

Personality, peer, and parent behaviour were all found to be positively related to global reckless behaviour, as expected. These findings are consistent with the study's hypotheses and previous literature in the area (e.g., Bradley & Wildman, 2002; C. Li et al., 2002; Wagner et al., 2001).

Yet again, the hypotheses that peer and parent messages would be negatively associated with global reckless behaviour were not supported in the current study. As hypothesized in this study, Sensation Seeking was the strongest predictor of global reckless behaviour. This finding makes a great deal of sense if one considers the subscales that contribute to the Total Sensation Seeking variable and the items measured by the Reckless Behaviour Questionnaire. First of all, the Disinhibition subscale is a measure of need for social stimulation in an unrestrained manner (Zuckerman et al., 1972). Lack of self-restraint has been linked to activities such as theft (Langton, Piquero, & Hollinger, 2006) and drug addiction (Nordgren, van Harreveld, & van der Pligt, 2009), as well as sexual promiscuity (Love, 2006). Secondly, individuals high on Experience seeking tend to seek out activities that enhance their inner experiences. This subscale has been correlated with drug use in the past (Zuckerman et al., 1972).

Another subscale, Boredom Susceptibility, refers to a sense of restlessness with routine activities resulting in the need for novelty and change (Zuckerman et al., 1972). Research has shown that males tend to be more prone to boredom than their female counterparts (Vodanovich & Kass, 1990). This subscale is particularly relevant for the reckless driving items on the RBQ. Driving, while initially requiring much cognitive focus, becomes automatic after awhile (Hunt & Ellis, 2004; Medlin & Ross, 1997) and it makes sense that individuals who are highly susceptible to boredom would feel a need to “shake things up” and make driving more exciting. Unfortunately, driving can be dangerous, especially if intoxicated, and it is difficult to conceive of a way for individuals to be less bored while driving by engaging in some other “safe” activity, beyond singing along with the radio. Many people multi-task while they drive (e.g., talk or text on cell phones, eat or drink while driving, use MP3 players, etc.) and such distractions reduce cognitive processing speed and negatively impact driving reaction times (Chisholm, Caird, & Lockhart, 2008; Hendrick & Switzer, 2007; Young, Mahfoud, Walker, Jenkins, & Stanton, 2008).

Lastly, Thrill and Adventure Seekers tend to enjoy outdoor sports that involve speed and excitement; precisely the types of activities that have been considered more socially sanctioned forms of risk-taking (Teese & Bradley, 2008). Thrill and Adventure Seeking is sometimes described as the “non-impulsive, socialized Sensation Seeking” (Roberti, 2004). Perhaps future studies should examine the differences between Sensation Seekers who prefer risky to reckless behaviours (e.g., Thrill and Adventure Seekers compared to Disinhibited individuals) to determine which factors contribute to activity selection among Sensation Seekers. It is possible that cognitive factors might be at play, such as perceptions of risks and benefits (Teese & Bradley, 2008). It would also be interesting to follow Sensation Seekers longitudinally to

determine whether their scores on the four subscales change over time. Perhaps some individuals move from Disinhibition to Thrill and Adventure Seeking as they mature. Alternatively, individuals who remain high on Disinhibition after the emerging adulthood phase may escalate in terms of health-risk behaviours and may prove more costly to society (e.g., individuals who used marijuana when they were younger may up the ante and start using “harder” drugs to satisfy their need for stimulation).

For all of the substance use behaviours considered in the current study, there were notable differences between participants who had never experimented with the substance and those who had. These differences raise questions about the factors that are associated with the choice to be in one group or another – i.e., the decision to try out something with an inherent risk or not—“experimenters” versus “abstainers”. Some research has been done that might help to explain these variations in willingness to experiment with health-risk behaviours. Tucker and colleagues (2006) compared marijuana “abstainers”, “experimenters”, and “frequent users” in a sample of 2255 individuals. Participants were assessed in grade 12 and again at age 23. The researchers found that marijuana abstainers tended to be more introverted than their marijuana using counterparts. These abstainers reported high parental support and satisfaction with friendships, as well as a strong academic orientation (e.g., getting good grades). The authors postulated that the key to “more favorable [...] functioning” is higher conscientiousness and lower impulsivity plus parental support during adolescence. These findings are consistent with past research on alcohol abstention where abstainers were found to be lower on Sensation Seeking and less likely to be diagnosed with an externalizing disorder than their alcohol-consuming counterparts (Milich et al., 2000). Abstainers also have been found to score higher on measures of conscientiousness as compared to moderate or heavy substance users (Walton &

Roberts, 2004). The current findings add to the research on Sensation Seeking (i.e., Sensation Seeking traits were higher in substance users than abstainers) and suggest that peer substance use, much like in adolescence, plays an important role in emerging adults' decisions to abstain, experiment, or frequently use substances.

In summary, in addition to identifying correlates of different groups of substance users, the current study provides a greater context for health-risk behaviours in emerging adulthood and highlights the importance of including Sensation Seeking as a factor. The findings of this study support the co-occurrence of health-risk behaviours in emerging adults but challenge the notion that because these behaviours co-occur, they must share the very same underpinnings (e.g., Cooper, Wood, Orcutt, & Albino, 2003). While the present study does support past findings of significant relationships between personality, peer, and parent factors and health-risk behaviours, it goes one step further to elucidate the significant variations within these relationships. Specifically, peer behaviour was found to be the critical predictor of substance use in emerging adults, Sensation Seeking was found to predict global reckless behaviours, including illegal activities, such as stealing or using marijuana, and parent behaviour was found to be predictive of reckless driving in emerging adults. It would appear that while health-risk behaviours that persist into emerging adulthood tend to co-occur and tend to be related to the same underlying factors, they tend not to be related to these factors to the same degree. This qualification is important as it has serious implications for intervention practices. In order to improve effectiveness, interventions ought to be tailored to the strongest source(s) of influence for each health-risk behaviour despite their co-occurrence.

Intervention suggestions

The fact that so many young people engage in behaviours that pose a threat to their health despite efforts to educate them about the associated dangers (Braucht, 1975; McKnight & McPherson, 1986; Hwang et al., 2004) suggests that newer and better interventions are needed. Few evidence-based intervention programs exist to combat health-risk behaviours in emerging adults. Researchers have found that educational approaches do not work and interventions aimed at altering attitudes or enhancing skills have more success comparatively but are not highly effective overall (Walters et al., 2000). There is some support in the literature for programs that use the stages of change model (Armitage & Arden, 2008); however, these interventions typically focus on one behaviour and do not seek to address the more global constellation of health-risk behaviours. A search of the National Registry of Evidence-based Programs and Practices (NREPP) (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.) for empirically supported programs for adolescents and young adults yielded some results. The relevant intervention programs are reviewed below.

Four pertinent programs were found that targeted young adults or individuals in the emerging adulthood range: Not On Tobacco (N-O-T), Project EX, Brief Alcohol Screening and Intervention for College Students (BASICS), and Challenging College Alcohol Abuse (CCAA). Not On Tobacco (N-O-T) is a smoking intervention program (reviewed in 2008) for individuals between the ages of 14 and 19. This program is 10 weeks long and consists of weekly 50-minute group sessions for male and female smokers separately (with the option of four additional sessions). Topics of discussion include nicotine withdrawal, stress management, social skills training, coping with peer pressure, and relapse prevention. Studies have shown that female

smokers in N-O-T successfully quit smoking and there was a significant reduction in cigarettes smoked for both males and females in the program as compared to those in a “brief intervention (BI)” control group, which consisted of self-help brochures and a short presentation on smoking cessation (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). Given the results of the current study, one might speculate that the essential parts of this intervention are the work geared toward coping with peer pressure and modeling non-smoking behaviour in peers.

Project EX is a similar smoking intervention program (reviewed in 2006) aimed at student smokers. It is 6 weeks long and consists of eight sessions that are approximately 45 minutes each. Games and yoga are used in addition to discussion to help students cope with stress and nicotine withdrawal. Information is provided about tobacco use and relapse prevention strategies are discussed. A study of the program revealed that Project Ex significantly changed students’ motivation to quit smoking and more students in the program than in the control group had not smoked for 30 days at the 3-month follow-up (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). Perhaps the group format of this intervention, like the previous, provides an opportunity for peer modeling of non-smoking behaviour.

Brief Alcohol Screening and Intervention for College Students (BASICS) is a program (reviewed in 2008) designed to decrease alcohol consumption in students who “drink alcohol heavily and have experienced or are at risk for alcohol-related problems” (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). The student attends an interview and completes an online assessment survey to determine his/her attitudes and behaviours in relation to alcohol consumption. Then, the

student attends another interview where “a customized feedback profile” is used to educate him/her about alcohol use norms and to highlight the personal consequences of excessive alcohol use. One study of this program found that students who had done BASICS reported significant decreases in frequency and quantity of alcohol consumption over a 4-year period compared to a no-treatment control group. Another study found that in the short-term (6 weeks), binge drinkers who had done BASICS reported a significant decrease in frequency and quantity of alcohol consumption, when controlling for gender (Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.).

Similarly, Challenging College Alcohol Abuse (CCAA) is a program (reviewed in 2008) intended to decrease alcohol consumption and its negative sequelae in college students. This program takes a different approach by using the media on college campuses to correct misperceptions about drinking. Facts and norms related to alcohol use are conveyed through articles in the school paper and posters on campus. Such media are designed to inform students and to encourage discussion among students and staff. CCAA also supports social gatherings without alcohol as alternatives to the more typical campus events where alcohol is served. A longitudinal study revealed that within 3 years of implementing CCAA, quantity and frequency of alcohol consumption significantly decreased, as did negative outcomes related to excessive drinking, such as missing classes, getting into fights, and “being taken advantage of sexually” (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). It is possible that the provision of “norms” in both of these interventions is helpful because it gives participants a reference point for peer behaviour.

These interventions seem somewhat promising; however, they are narrowly focused on either tobacco use or alcohol consumption, and fail to address other health-risk behaviours. They

capitalize minimally on the influence of peers, which is problematic given this study's findings that peers are of great importance to emerging adults, especially in terms of their substance use. Moreover, these programs neglect personality risk factors, such as propensity for Sensation Seeking. One of the primary findings of the current study is that emerging adults who are high in Sensation Seeking, especially Disinhibition, are more likely to engage in health-risk behaviours in general. On the positive side, a substantial number of evidence-based intervention programs for younger youth exist that take peer and personality factors into account and potentially could be modified for older populations (Duangpatra et al., 2009).

As evidenced earlier, the natural place to intervene with youth tends to be at school (CCSA, 2007). The findings from the current study suggest that it would be beneficial to develop interventions that target the need for arousal in high Sensation Seekers. These youth could be encouraged to find activities that are stimulating but not dangerous to one's health (Duangpatra et al., 2009; Hurrelmann & Richter, 2006; Jonah, 1997; Roberti, 2004), such as taking kickboxing, learning to dance, or being part of an improvisation troop. It might be advantageous to have focus groups with emerging adult Sensation Seekers to inquire about activities that they would find exciting that are also relatively physically safe. The program SPORT (reviewed in 2008) is designed to steer adolescents away from substance abuse by guiding them toward physical activity and "health-promoting habits" (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). Participants complete a short health behaviour survey then receive a personal consultation and a handout with important facts about an active lifestyle that stresses the disadvantages of substance abuse. The adolescents create a fitness goal plan and their parents receive "communication cards" to help them promote healthy behaviour. A study found that SPORT participants had lower frequency

and quantity of alcohol use and less frequent cigarette use than control group participants, who received a wellness brochure at school and a brochure about teen health and fitness at home. SPORT participants who used drugs in the past were found to have reduced smoking, drinking, and marijuana usage compared to their drug-using control group counterparts (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). The SPORT program could be adapted for emerging adults by eliminating the parental involvement aspect of the program and having it offered at the CEGEP as part of the curriculum, which currently has a mandatory physical education component with the objective of promoting a healthy lifestyle (Dawson College, n.d.; Marianopolis College, 2008).

The current study also confirmed once again that peers play an important role in health-risk behaviours, even beyond adolescence and into emerging adulthood. An important factor to consider is the sense of belonging that many of these youth are likely seeking. Social psychological research on friendships has revealed that certain factors enhance the likelihood of friendship, such as proximity, and sharing similar attitudes, beliefs, and values (Myers, 1996). Connection with others is an integral part of life and substance-using peer groups may fill that need for a sense of belonging that youth often crave. LifeSkills Training (LST) is a program (reviewed in 2008) for high school students that focuses on social influence and is aimed at preventing substance use and violence. Small group activities, discussions, and role playing are used to build skills to “understand and resist pro-drug influences” (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). Studies reveal that participants in LST had significantly lower rates of cigarette smoking, alcohol consumption, and “polydrug use” when compared to controls (2008). This program could be employed for emerging adults provided the content and role plays were adapted for

older individuals. The interactive nature of the intervention coupled with the fact that it is offered in groups might heighten social connectedness thereby offering participants an alternative to bonding with peers who engage in health-risk behaviours. One difficulty, however, would be determining where such a program would be available—at the educational institution (e.g., the CEGEP) or in the community (e.g., community health centre, hospital, etc.).

The current study found that parent substance use was a significant predictor of reckless driving in emerging adults. Interventions that specifically target reckless driving are rare; however, some general parenting interventions for health-risk behaviours have been supported by research (Blanton et al., 1997; U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). A study by Melby, Conger, Conger, and Lorenz (1993) found that “harsh, inconsistent discipline and low levels of nurturance increased the risk of smoking among seventh grade boys” (as cited in Chassin et al., 1998) and Latendresse and colleagues (2008) found that parenting mediates the relationship between parental and adolescent alcohol use. Parenting Wisely, American Teens, is a program for parents of pre-adolescents and adolescents that is accessible online. Over the course of nine sessions, parents watch videos of family interactions and must select solutions to problems that are then discussed and critiqued. Parents also receive written material, such as a workbook, to continue to practice their skills. Studies have shown improvements in children’s behaviour and in parenting aptitude in families where parents used this program (U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). An online parent instruction program such as this might be beneficial for educating parents about their role in their children’s unsafe driving practices. Parents may also impact their children’s

choice of friends (Kandel, 1996; Rubin & Sloman, 1984), thereby indirectly contributing to their engagement in health-risk behaviours, as well.

There was also a notable trend in the current study for emerging adults with Sensation Seeking tendencies to drive more recklessly. Protecting You/Protecting Me (PY/PM) is a program (reviewed in 2008) aimed at preventing students in elementary school and grades 11 and 12 from getting into a car with an impaired driver. The high school students teach the elementary school students about alcohol use and the developing brain, vehicle safety, and “life skills” that include ways of resisting social influences. In delivering lessons to the younger children, the adolescents are empowered to serve as role models and must educate themselves about the risks of driving under the influence of alcohol. This program could easily be adapted for emerging adults by putting CEGEP students in charge of educating high school and/or elementary school students about dangers related to driving under the influence. Teaching others may provide stimulation, which would appeal to Sensation Seekers, and research has shown that public endorsement of a belief strengthens it (Deutsch & Gerard, 1955).

In addition to parenting programs and school-based programs, there are some community-based interventions that have empirical support, such as Communities Mobilizing for Change on Alcohol (CMCA), which focuses on changing policies to curtail underage drinking (Substance Abuse and Mental Health Services Administration (SAMHSA), n.d.). There is some evidence to suggest that driving recklessly, particularly driving under the influence of alcohol, reflects an underlying tendency to be involved in delinquent behaviour (Donovan, 1993) and that interventions ought to be behaviourally based—offering incentives to good drivers and punishing dangerous driving (Williams, 2006). Police in Sacramento, California have experimented with pulling over good drivers to give them Starbucks gift certificates as a means of reinforcing their

good behaviour (The Associated Press, 2007). Transport Canada is testing a device that monitors driving and gives the driver points for staying within the speed limit and not tailgating (CBC News, 2007). Research has shown that legal interventions are most effective in reducing drinking and driving among youth (Chen et al., 2008). While higher minimum drinking ages and graduated licensing procedures have proved successful, safety education initiatives have been insufficient in altering reckless driving behaviour in young adults because they emphasize driving practices, fail to address risk factors, and are not comprehensive enough (Chen et al., 2008; Williams, 2006).

There has been a call for intervention programs to contain a “*specific component* that differs according to specific risk behaviour” (Hurrelmann & Richter, 2006). Drawing from the programs discussed in this section and the findings from the current study, it appears as though future interventions for health-risk behaviours in emerging adults ought to incorporate several elements: 1) the promotion of physical activity for Sensation Seekers, 2) the use of an interactive teaching approach for strategies to resist social influences (e.g., peer behaviour), including having students teach others about the dangers of health-risk behaviours, 3) the provision of online access to parenting instruction with the aim of educating parents about the relationship between their driving habits and their children’s, and 4) the institution of community level programs, such as introducing reward programs for good driving. As far as all future programs are concerned, it would be important to evaluate any and all intervention efforts to ensure that more is learned about what works and what does not in order to add to the base of empirically supported interventions in this area.

Directions for future research

Clearly, personality, peer, and parent variables all contribute to health-risk behaviours in emerging adults. Further research is needed in all three domains—to determine safe alternatives to health-risk behaviours for Sensation Seekers (Hurrelmann & Richter, 2006; Roberti, 2004), to examine sense of belonging among peer groups of substance users, and to assess parenting skills in relation to reckless driving. Examples of possible research projects follow.

In order to determine safe alternatives to health-risk behaviours that will satisfy Sensation Seekers, researchers could have participants engage in a variety of activities, such as playing videogames, riding rollercoasters, or doing amateur stand-up comedy. Participants could use self-report measures to assess their levels of satisfaction. Also, researchers could measure participants' levels of cortisol (or another biological indicator of stress) before and after the activities to determine whether or not they were physiologically stimulating.

The extent to which emerging adults who engage in health-risk behaviours (especially substance use) do so because they feel a sense of belonging within their peer group could be determined by interview or self-report. Youth who report a strong sense of belonging within an unconventional peer group are more likely to engage in health-risk behaviours than their counterparts in conventional peer groups (McNeely & Falci, 2004). Adolescents and/or emerging adults who are required to change schools, and therefore form new friends, could be assessed in order to determine changes within their health-risk behaviour patterns.

In order to study the impact of parenting on reckless driving, parents of pre-adolescents who score highly on Sensation Seeking measures could be randomly assigned to parenting groups. The first group would receive training to be authoritative, the second group would receive generic parenting advice, and the control group would not receive any intervention.

Longitudinal follow-up would help to determine whether adolescents of parents who used authoritative strategies were less likely than those of parents who used alternate strategies to engage in reckless behaviours as late adolescents and young adults.

This discussion has generated some hypotheses for future research: a) if high Sensation Seekers were provided with safe alternatives to reckless behaviours they would decrease their substance use and reckless driving, b) youth who report being influenced by peers to engage in health-risk behaviours (particularly substance use) would choose a safer peer group if one were available to them that could provide them with the same sense of belonging, c) anti-substance use messages would have a stronger impact on youth whose parents used an authoritative parenting style than on those whose parents were authoritarian or permissive, and d) emerging adults who are rewarded for driving well would decrease their reckless driving regardless of their Sensation Seeking tendencies, especially if the reward system were coupled with experience volunteering with young adults injured in car crashes.

Limitations

The findings in this study must, of course, be interpreted in light of the study's limitations. These limitations include the cross-sectional design, the use of convenience and snowball sampling, the use of self-report measures for self and others, the potentially questionable validity of the peer and parent measures, the use of a sample primarily comprised of Anglophone emerging adults attending post-secondary schools in the Montreal region, and the lack of assessment of mental disorders and environmental stressors.

The cross-sectional design of the current study prohibits any conclusions about the temporal sequence of parental and peer behavioural and attitudinal influences on the emerging adult participants. Furthermore, as in all correlational studies, it is impossible to determine the direction of the causal pathway, or whether a third variable accounted for the relationships between peer behaviour and/or Sensation Seeking and health-risk behaviours. A strength of the current study is that substance use groups were tested, which allowed for comparisons to be made among the different types of experimentation classifications—e.g., comparing individuals who never smoked cigarettes (“non-experimenters”) with those who smoke currently. The measures of “past substance use” are less than ideal given that they lack important information on length, duration, and timing of use. Nevertheless, the results of this study provide a foundation on which future research could build; the associations found between the influences and the particular health-risk behaviours could provide the basis for further longitudinal research.

The use of convenience and snowball sampling limit the extent to which the findings of the study can be generalized. Random sampling was not feasible, in part due to constraints by the ethics of each institution, and by the desired characteristics of the sample. The variation in sampling method according to the institution was as a direct result of the schools' research

protocols. Although participants at Marianopolis College were recruited from Psychology, English, and Sociology classes, whereas those at Dawson were recruited in the cafeteria, they were not only from one department but rather were distributed amongst primarily Commerce, Social Science, and Health Science, as well as the other programs at that school. Furthermore, all students were informed that participation was voluntary and some students chose to not complete the questionnaires. Thus, although the sampling methods were slightly different at each school, it likely did not have a great impact on the findings of this study.

The use of self-report measures represents another limitation of the study, however, there is precedent in the literature for using self-report measures in this area (Avenevoli & Merikangas, 2003; C. Li et al., 2002; Wood et al., 2004) and Kosterman and colleagues (2000) report that such measures have been found to provide valid and reliable data when they were administered privately and confidentially. Research has shown that adolescents reliably report their own health-risk behaviour (Flisher, Evans, Muller, & Lombard, 2004; Graham et al., 1984; Kentala, Utrainen, Pahkala, & Mattila, 2004). One study verified adolescent self-reporting of smoking by comparing their responses to objective biochemical measurements of thiocyanate in the adolescents' saliva and carbon monoxide in the air they exhaled. The researcher found that the self-reports generally provided a reliable estimate of adolescent smoking (Kentala et al., 2004). The fact that the measures were all completed by the same participants raises the issue of shared variance (e.g., participants who report their own substance use may be more likely to report peer and parent substance use), however, it is important to note that self-report measures are often the only means of acquiring information pertinent to participants' beliefs and perceptions (MacKinnon et al., 1991). Research shows that there is a strong correlation between perceived and actual substance use and that perceived use of others is a better predictor of adult

substance use than actual use of others (C. Li et al., 2002). In order to assess whether or not participants were over- or under- reporting, the current study included a social desirability measure (Appendix F). However, it could not be analyzed due to its low internal consistency in the current study. Perhaps this measure ought to have been presented at the start of the battery rather than at the end when participants were likely tired.

Another potential limitation of the current study concerns the validity of the peer and parent measures. Perhaps the terms “peer influence” and “parental influence” are misnomers because they actually reflect participants’ perceptions of peer and parent behaviours rather than objective measures of their influences. Moreover, there is the possibility that the results may reflect the fact that the peer measures were more valid than the parent ones given the tendency for emerging adults to spend more time with their peers than their parents during this developmental phase. In the future, research in this area would benefit greatly from a longitudinal study involving parents and peers themselves, in addition to the emerging adult participants, where social influences could be assessed over time using objective measures of substance use, such as blood or saliva tests. Given the financial, time, and resource constraints of the current project, a longitudinal study was not feasible in this context.

Issues regarding the demographics of the sample (e.g., school, district, and province) are ones that most studies face due to lack of resources and the financial and practical restrictions of sampling. It would have been useful to have looked at whether or not the participants were living at home with their parents, as is the norm in Montreal. Future research is necessary to replicate the findings of this study and to generalize to other populations.

A final limitation is that this study did not assess people for mental health problems or personality traits other than Sensation Seeking, which may have contributed to the endorsement

of health-risk behaviours—e.g., externalizing disorders, Attention Deficit Hyperactivity Disorder (ADHD), or Bipolar Disorder, may play a role in the initiation and maintenance of health-risk behaviours, particularly substance use (CCSA, 2007; Fergusson, Horwood, & Ridder, 2005; Krueger, Markon, Patrick, Benning, & Kramer, 2007). Also, the importance of contextual variables must be considered and this study did not inquire about stressful life events and their impact on subsequent substance use. For instance, substances may be used as coping mechanisms (Hurrelmann & Richter, 2006). Despite these limitations, the current study makes significant contributions to the bodies of literature on health-risk behaviours and emerging adulthood.

Implications

This study illuminates the relative roles of personality, peer, and parent influences on health-risk behaviours and contributes to the knowledge base on emerging adulthood. The findings of this study support the importance of the three aforementioned domains of influence on health-risk behaviours and show that different health-risk behaviours are related to the same underlying factors but to varying degrees. This study extends past research by revealing the strongest predictors of cigarette smoking, marijuana usage, alcohol inebriation, reckless driving, and global reckless behaviours. Specifically, the results demonstrate that peer behaviour is the most significant predictor of substance use in emerging adults. Furthermore, Sensation Seeking, or Disinhibition in particular, is the most potent predictor of global reckless behaviours, and parent behaviour is a significant predictor of reckless driving in this population. The current study's findings make a significant contribution to the literature as they put peers, parents, and personality into perspective and help to focus intervention initiatives.

For emerging adults, life is always in flux and the uncertainty and instability of this time may affect the underlying influences of their health-risk behaviours. It makes sense that individuals would rely on their peers as they attempt to become self-sufficient. The goal of emerging adulthood is independence (and thereby attainment of full-fledged adulthood) but humans are an interdependent species so it is therefore logical that as they move away from their parents, emerging adults seek out their friends. Perhaps some look for peers who share similar habits, while others are willing to compromise their health in order to maintain social connectedness. Also, it is possible that emerging adulthood opens up a new realm of possibilities for Sensation Seekers and they engage in behaviours that incidentally may compromise their health as they try to experience new things and/or cope with the demands of their busy lives. In

conclusion, emerging adulthood is a stressful period that lends itself to the expression of Sensation Seeking tendencies and pressures of peer affiliation. Emerging adults tend to engage in health-risk behaviours in response to the freedom this time provides and as a means of connecting to or continuing to connect to peers.

Efforts are being made to address health-risk behaviours, including substance use and reckless driving, among Canadian youth (Government of Canada, 2009; Health Canada, 2001). In fact, there is currently a national multi-media anti-drug campaign (launched June 1st 2011) aimed at parents and youth in Canada by the organization Partnership for a Drug Free Canada. The notion of targeted interventions has been gaining popularity in medicine and other health care disciplines, and has started to take root in psychology, as well (O'Leary-Barrett, Mackie, Castellanos-Ryan, Al-Khudhairy, & Conrod, 2010). Focusing on the relevant predictor(s) of each type of health-risk behaviour would permit a more precise and cost-effective approach to reducing the negative consequences associated with such behaviours. The findings of the current study could help future intervention practices by informing the creators of such programs about the most salient influences on health-risk behaviours in this emerging adult population. Interventions could then target parents who pass along their reckless driving habits, address individuals with peers who use substances by offering other means of affiliation, and help Sensation Seekers to channel their need for stimulation into activities more consistent with Thrill and Adventure Seeking in order to decrease participation in health-risk behaviours among emerging adults.

References

- Allen, J. P., & Brown, B. B. (2008). Adolescents, peers, and motor vehicles: The perfect storm? *American Journal of Preventive Medicine, 35*, 289-293.
- Armitage, C. J., & Arden, M. A. (2008). How useful are the stages of change for targeting interventions? Randomized test of a brief intervention to reduce smoking. *Health Psychology, 27*, 789-798.
- Arnett, J. (1992a). Reckless behaviour in adolescence: A developmental perspective. *Developmental Review, 12*, 339-373.
- Arnett, J. (1992b). Socialization and adolescent reckless behaviour: A reply to Jessor. *Developmental Review, 12*, 391-409.
- Arnett, J. J. (1995). The young and the reckless: Adolescent reckless behaviour. *Current Directions in Psychological Science, 4*, 67-71.
- Arnett, J. J. (1996). Sensation Seeking, aggressiveness, and adolescent reckless behaviour. *Personality and Individual Differences, 20*, 693-702.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*, 469-480.
- Arnett, J.J. (2004). *Emerging Adulthood: The Winding Road From the Late Teens Through the Twenties*. New York, NY: Oxford University Press, Inc.
- Arnett, J. J. (2005). The developmental context of substance use in emerging adulthood. *Journal of Drug Issues, 235*-254.
- Arnett, J. J. (2007). The myth of peer influence in adolescent smoking initiation. *Health Education & Behaviour, 34*, 594-607.

- Arnett, J. J., Offer, D., & Fine, M. A. (1997). Reckless driving in adolescence: 'State' and 'trait' factors. *Accident Analysis and Prevention, 29*, 57-63.
- Avenevoli, S., & Merikangas, K. R. (2003). Familial influences on adolescent smoking. *Addiction, 98*, 1-20.
- Bailey, S. L., Ennett, S. T., & Ringwalt, C. L. (1993). Potential mediators, moderators, or independent effects in the relationship between parents' former and current cigarette use and their children's cigarette use. *Addictive Behaviours, 18*, 601-621.
- Bailey, S. L., & Hubbard, R. L. (1991). Developmental changes in peer factors and the influence on marijuana initiation among secondary school students. *Journal of Youth and Adolescence, 20*, 339-360.
- Barger, S. D. (2002). The Marlowe-Crowne affair: Short forms, psychometric structure, and social desirability. *Journal of Personality Assessment, 79*, 286-305.
- Bauman, A., & Phongsavan, P. (1999). Epidemiology of substance use in adolescence: Prevalence, trends, and policy implications. *Drug and Alcohol Dependence, 55*, 187-207.
- Blanton, H., Gibbons, F. X., Gerrard, M., Jewsbury Conger, K., & Smith, G. E. (1997). Role of family and peers in the development of prototypes associated with substance use. *Journal of Family Psychology, 11*, 271-288.
- Bradley, G., & Wildman, K. (2002). Psychosocial predictors of emerging adults' risk and reckless behaviours. *Journal of Youth and Adolescence, 31*, 253-265.
- Braucht, N. G. (1975). Preventing teenage problem drinking: An enticing prospect, tried but unproven. *Psychiatric Opinion, 12*, 22-25.

- Canadian Centre on Substance Abuse [CCSA]. (2007). *Substance Abuse in Canada: Youth in Focus*. Ottawa, ON: Canadian Centre on Substance Abuse.
- Carlson, T. E. (2003). Impact of family support, peer relations and sensation seeking on adolescent problem behaviors and academic skills. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 05 2003, 63/11-B(5560), 0419-4217.
- Caspi, A., Begg, D., Dickson, N., Harrington, H., Langley, J., Moffitt, T. E., Silva, P. A. (1997). Personality differences predict health-risk behaviours in young adulthood: Evidence from a longitudinal study. *Journal of Personality and Social Psychology*, 73, 1052-1063.
- CBC News (2007, September 11). Government to test speed monitor that rewards safe driving Retrieved August 8, 2008, from <http://www.cbc.ca/technology/story/2007/09/11/tech-speed-limiters.html>.
- Chassin, L., Presson, C. C., Sherman, S. J., Montello, D., & McGrew, J. (1986). Changes in peer and parent influence during adolescence: Longitudinal versus cross-sectional perspectives on smoking initiation. *Developmental Psychology*, 22, 327-334.
- Chassin, L., Presson, C. C., Todd, M., Rose, J. S., & Sherman, S. J. (1998). Maternal socialization of adolescent smoking: The intergenerational transmission of parenting and smoking. *Developmental Psychology*, 34, 1189-1201.
- Chen, M-J., Grube, J. W., Nygaard, P., & Miller, B. A. (2008). Identifying social mechanisms for the prevention of adolescent drinking and driving. *Accident Analysis and Prevention*, 40, 576-585.
- Chisholm, S. L., Caird, J. K., & Lockhart, J. (2008). The effects of practice with MP3 players on driving performance. *Accident Analysis & Prevention*, 40, 704-713.

- Clapper, R. L., Martin, C. S., & Clifford, P. R. (1994). Personality, social environment, and past behaviour as predictors of late adolescent alcohol use. *Journal of Substance Abuse, 6*, 305-313.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioural Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Cohen, J. (1992). A power primer. *Psychological Bulletin, 122*, 155-159.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied Multiple Correlation/Regression Analysis for the Behavioral Sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Cooper, M. L., Wood, P. K., Orcutt, H. K., & Albino, A. (2003). Personality and the predisposition to engage in risky or problem behaviors during adolescence. *Journal of Personality and Social Psychology, 84*(2), 390–410. doi:10.1037/0022-3514.84.2.390
- Dawson College (n.d.). Physical Education Retrieved July 10, 2009, from <http://www.dawsoncollege.qc.ca/?E2BD3AAD-572D-4E18-BA81-FEDC2E77DA78>.
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *Journal of Abnormal and Social Psychology, 51*, 629-636.
- Donovan, J. E. (1993). Young adult drinking-driving: Behavioural and psychosocial correlates. *Journal of Studies on Alcohol, 54*, 600-613.
- Donovan, J. E., & Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology, 53*, 890-904.

- Duangpatra, K. N. K., Bradley, G. L., & Glendon, A. I. (2009). Variables affecting emerging adults' self-reported risk and reckless behaviors. *Journal of Applied Developmental Psychology, 30*, 298-309.
- Feldman, R. S. (1998). *Child Development*. New York: Prentice-Hall, Inc.
- Fergusson, D. M., Horwood, L. J., & Ridder, E. M. (2005). Show me the child at seven: The consequences of conduct problems in childhood for psychosocial functioning in adulthood. *Journal of Child Psychology and Psychiatry, 46*, 837-849.
- Flisher, A. J., Evans, J., Muller, M., & Lombard, C. (2004). Brief report: Test-retest reliability of self-reported adolescent risk behaviour. *Journal of Adolescence, 27*, 207-212.
- Frankenberger, K. D. (2004). Adolescent egocentrism, risk perceptions, and sensation seeking among smoking and non-smoking youth. *Journal of Adolescent Research, 19*, 576-590.
- Galambos, N. L., & Tilton-Weaver, L. C. (1998). Multiple-risk behaviour in adolescents and young adults. *Health Reports, 10*, 9-20.
- Galizio, M., Rosenthal, D., & Stein, F. A. (1983). Sensation Seeking, reinforcement, and student drug use. *Addictive Behaviours, 8*, 243-252.
- Gibbons, F. X., & Gerrard, M. (1995). Predicting young adults' health-risk behaviour. *Journal of Personality and Social Psychology, 69*, 505-517.
- Government of Canada (2006). *Public Opinion, Attitudes and Knowledge - A National Survey of Canadians' Use of Alcohol and Other Drugs - Canadian Addiction Survey (CAS)*. Retrieved August 8, 2008. from http://www.hc-sc.gc.ca/hc-ps/pubs/adp-apd/cas_opinions-etc/index-eng.php.

- Government of Canada (2009). SafeCanada.ca - Impaired Driving Retrieved August 8, 2008, from http://www.safecanada.ca/link_e.asp?category=2&topic=16.
- Gouvernement du Québec (2005). *Prevalence in Quebec - Smoking*. Retrieved August 8, 2008. from <http://www.msss.gouv.qc.ca/sujets/santepub/tabac/index.php?aid=106>.
- Gowing, L. R., Henry-Edwards, S. M., Irvine, R. J., & Ali, R. L. (2002). The health effects of ecstasy: A literature review. *Drug and Alcohol Review, 21*, 53-63.
- Graham, J. W., Flay, B. R., Johnson, C. A., Hansen, W. B., Grossman, L., & Sobel, J. L. (1984). Quantitative methods in the study of drug use. *Journal of Drug Education, 14*, 175-193.
- Griffin, K. W., Botvin, G. J., Doyle, M. M., Diaz, T., & Epstein, J. A. (1999). A six-year follow-up study of determinants of heavy cigarette smoking among high-school seniors. *Journal of Behavioural Medicine, 22*, 271-284.
- Hair, E. C., Park, M. J., Ling, T. J., & Moore, K. A. (2009). Risky behaviors in late adolescence: Co-occurrence, predictors, and consequences. *Journal of Adolescent Health, 45*, 253-261.
- Hawkins, D., & Monahan, K. (2009). *Covariance of problem behaviors in adolescence*. Paper presented at IOM Committee on the Science of Adolescence Workshop, Washington, DC.
- Hendrick, J. L., Switzer, J. R. (2007). Hands-free versus hand-held cell phone conversation on a braking response by young drivers. *Perceptual and Motor Skills, 105*, 514-522.
- Hosmer, D. W., & Lemeshow, S. (2000). *Applied Logistic Regression* (2nd ed.). New York: John Wiley and Sons, Inc.

- Hoyle, R. H., Stephenson, M. T., Palmgreen, P., Pugzles Lorch, E., & Donohew, R. L. (2002). Reliability and validity of a brief measure of Sensation Seeking. *Personality and Individual Differences, 32*, 401-414.
- Hunt, R. R., & Ellis, H. C. (2004). *Fundamentals of Cognitive Psychology* (7th ed.). New York: McGraw-Hill.
- Hurrelmann, K., & Richter, M. (2006). Risk behaviour in adolescence: The relationship between developmental and health problems. *Journal of Public Health, 14*, 20-28.
doi: 10.1007/s10389-005-0005-5.
- Hwang, M. S., Yeagley, K. L., & Petosa, R. (2004). A meta-analysis of adolescent psychosocial smoking prevention programs published between 1978 and 1997 in the United States. *Health Education and Behaviour, 31*, 702-719.
- Jackson-Newsom, J., & Shelton, T. L. (2010). Psychobiological models of adolescent risk: Implications for prevention and intervention. *Developmental Psychobiology, 295-297*.
- Jessor, R. (1987). Problem-behaviour theory, psychosocial development, and adolescent problem drinking. *British Journal of Addiction, 82*, 331-342.
- Jessor, R. (1992). Risk behaviour in adolescence: A psychosocial framework for understanding and action. *Developmental Review, 12*, 374-390.
- Jessor, R., Van Den Bos, J., Vanderryn, J., Costa, F. M. & Turbin, M. S. (1995). Protective factors in adolescent problem behaviour: Moderator effects and developmental change. *Developmental Psychology, 31*, 923-933.
- Jessor, R., Turbin, M. S., Costa, F. M. (1997). Predicting developmental change in risky driving: The transition to young adulthood. *Applied Developmental Science, 1*, 4-16.

- Jessor, R., Turbin, M. S., Costa, F. M. (1998). Protective factors in adolescent health behaviour. *Journal of Personality and Social Psychology, 75*, 788-800.
- Jonah, B. A. (1997). Sensation Seeking and risky driving: A review and synthesis of the literature. *Accident Analysis and Prevention, 29*, 651-665.
- Kaestner, E., Rosen, L., & Appel, P. (1977). Patterns of drug abuse: Relationships with ethnicity, Sensation Seeking, and anxiety. *Journal of Consulting and Clinical Psychology, 45*, 462-468.
- Kail, R. V., Cavanaugh, J. C., & Ateah, C. A. (2006). *Human Development: A Life-Span View* (1st Canadian ed.). Toronto, Ontario: Nelson, a division of Thomson Canada Ltd.
- Kandel, D. B. (1996). The parental and peer contexts of adolescent deviance: An algebra of interpersonal influences. *Journal of Drug Issues, 26*, 289-315.
- Kelly, E., Darke, S., & Ross, J. (2004). A review of drug use and driving: Epidemiology, Impairment, risk factors, and risk perceptions. *Drug and Alcohol Review, 23*, 319-344.
- Kentala, J., Utrainen, P., Pahkala, K., & Mattila, K. (2004). Verification of adolescent self-reported smoking. *Addictive Behaviours, 29*, 405-411.
- Kobus, K. (2003). Peers and adolescent smoking. *Addiction, 98 (Suppl 1)*, 37-55.
- Kosterman, R., Hawkins, J. D., Guo, J., Catalano, R. F., & Abbott, R. D. (2000). The dynamics of alcohol and marijuana initiation: Patterns and predictors of first use in adolescence. *American Journal of Public Health, 90*, 360-366.

- Krueger, R. F., Markon, K. E., Patrick, C. J., Benning, S. D., & Kramer, M. D. (2007). Linking antisocial behavior, substance use, and personality: An integrative quantitative model of the adult externalizing spectrum. *Journal of Abnormal Psychology, 116*(4), 645–666. American Psychological Association. doi:10.1037/0021-843X.116.4.645
- Lac, A., & Crano, W. D. (2009). Monitoring matters: Meta-analytic review reveals the reliable linkage of parental monitoring with adolescent marijuana use. *Perspectives on Psychological Science, 4*, 578-586.
- Langton, L., Piquero, N. L., & Hollinger, R. (2006). An empirical test of the relationship between employee theft and low self-control. *Deviant Behavior, 27*, 537-565.
- Latendresse, S. J., Rose, R. J., Viken, R. J., Pulkkinen, L., Kaprio, J., & Dick, D. M. (2008). Parenting mechanisms in links between parents' and adolescents' alcohol use behaviours. *Alcoholism: Clinical and Experimental Research, 32*, 322-330.
- Leadbeater, B. J., Foran, K., & Grove-White, A. (2008). How much can you drink before driving? The influence of riding with impaired adults and peers on the driving behaviours of urban and rural youth. *Addiction, 103*, 629-637.
- Li, C., Pentz, M. A., & Chou, C-P. (2002). Parental substance use as a modifier of adolescent substance use risk. *Addiction, 97*, 1537-1550.
- Li, F., Barrera, Jr., M., Hops, H., & Fisher, J. (2002). The longitudinal influence of peers on the development of alcohol use in late adolescence: A growth mixture analysis. *Journal of Behavioural Medicine, 24*, 293-315.
- Love, S. R. (2006). Illicit sexual behavior: A test of self-control theory. *Deviant Behavior, 27*, 505-536.

- Lynskey, M. T., Fergusson, D. M., & Horwood, L. J. (1998). The origins of the correlations between tobacco, alcohol, and cannabis use during adolescence. *Journal of Child Psychology and Psychiatry, 39*, 995-1005.
- MacKinnon, D. P., Johnson, C. A., Pentz, M. A., Dwyer, J. H., Hansen, W. B., Flay, B. R., et al. (1991). Mediating mechanisms in a school-based drug prevention program: First-year effects of the Midwestern prevention project. *Health Psychology, 10*, 164-172.
- Marianopolis College (2008). General Education Retrieved July 10, 2009, from http://www.marianopolis.edu/FS/Documents/GeneralEducation_08.pdf.
- Maxwell, K. A. (2002). Friends: The role of peer influence across adolescent risk behaviours. *Journal of Youth and Adolescence, 31*, 267-277.
- McCauley Ohannessian, C., & Hesselbrock, V. M. (2007). Do personality characteristics and risk taking mediate the relationship between paternal substance dependence and adolescent substance use? *Addictive Behaviours, 32*, 1852-1862.
- McGee, R., Williams, S., Poulton, R., & Moffitt, T. (2000). A longitudinal study of cannabis use and mental health from adolescence to early adulthood. *Addiction, 95*, 491-503.
- McKnight, J. A., & McPherson, K. (1986). Evaluation of peer intervention training for high school alcohol safety education. *Accident Analysis and Prevention, 18*, 339-347.
- McNeely, C., & Falci, C. (2004). School connectedness and the transition into and out of health-risk behaviour among adolescents: A comparison of social belonging and teacher support. *Journal of School Health, 74*, 284-292.

- Medin, D. L., & Ross, B. H. (1997). *Cognitive Psychology* (2nd ed.). Orlando, FL: Harcourt Brace & Company.
- Menard, S. (2001). *Applied Logistic Regression Analysis*. Sage University Papers Series on Quantitative Applications in the Social Sciences, 07-106. Thousand Oaks, CA: Sage.
- Middlecamp Kodl, M., & Mermelstein, R. (2004). Beyond modeling: Parenting practices, parental smoking history, and adolescent cigarette smoking. *Addictive Behaviours*, 29, 17-32.
- Miles, D. R., van den Bree, M. B. M., Gupman, A. E., Newlin, D. B., Glantz, M. D., & Pickens, R. W. (2001). A twin study on sensation seeking, risk taking behavior and marijuana use. *Drug and Alcohol Dependence*, 62, 57-68.
- Milich, R., Lynam, D., Zimmerman, R., Logan, T. K., Martin, C., Leukefeld, C., Portis, C., Miller, J., & Clayton, R. (2000). Differences in young adult psychopathology among drug abstainers, experimenters, and frequent users. *Journal of Substance Abuse*, 11, 69-88.
- Miller, T. R., Lestina, D. C., & Smith, G. S. (2001). Injury risk among medically identified alcohol and drug abusers. *Alcoholism: Clinical and Experimental Research*, 25, 54-59.
- Millstein, S. G., Halpern-Felsher, B. L. (2002). Judgments about risk and perceived invulnerability in adolescents and young adults. *Journal of Research on Adolescence*, 12, 399-422.
- Millstein, S. G., Ozer, E. J., Ozer, E. M., Brindis, C. D., Knopf, D. K., & Irwin, C. E. Jr. (1999). Research priorities in adolescent health: Analysis and synthesis of research recommendations. San Francisco, CA: University of California, San Francisco. National Adolescent Health Information Center.

- Moore, S. M., & Rosenthal, D. A. (1993). Venturesomeness, impulsiveness, and risky behaviour among older adolescents. *Perceptual and Motor Skills*, 76, 98.
- Murphey, D. A., Lamonda, K. H., Carney, J. K., and Duncan, P. (2004). Relationships of a brief measure of youth assets to health-promoting and risk behaviours. *Journal of Adolescent Health*, 184-191.
- Myers, D. G. (1996). *Social Psychology* (5th ed.). New York: McGraw-Hill.
- National Institute on Drug Abuse [NIDA]. (1997). Marijuana and tobacco use up again among 8th and 10th graders. In *A Collection of NIDA notes: Articles that address drug abuse prevention*. Rockville, MD: U.S. Department of Health and Human Services, PHS.
- National Institute on Drug Abuse [NIDA]. (1998). Nicotine Addiction. *Research Report*. Rockville, MD: U.S. Department of Health and Human Services, PHS.
- National Institute on Drug Abuse [NIDA]. (2001). Smoking may lead to anxiety disorders in adolescents and young adults. In *A Collection of NIDA notes: Articles that address research on nicotine*. Rockville, MD: U.S. Department of Health and Human Services, PHS.
- National Institute on Drug Abuse [NIDA]. (2002). Marijuana Abuse. *Research Report*. Rockville, MD: U.S. Department of Health and Human Services, PHS.
- Newcomb, M. D, McGee, L. (1991). Influence of Sensation Seeking on general deviance and specific problem behaviours from adolescence to young adulthood. *Journal of Personality and Social Psychology*, 61, 614-628.

- Nordgren, L. F., van Harreveld, F., & van der Pligt, J. (2009). The restraint bias: How the illusion of self-restraint promotes impulsive behavior. *Psychological Science, 20*, 1523-1528.
- O'Leary-Barrett, M., Mackie, C. J., Castellanos-Ryan, N., Al-Khudhairy, N., & Conrod, P. J. (2010). Personality-targeted interventions delay uptake of drinking and decrease risk of alcohol-related problems when delivered by teachers. *Journal of the American Academy of Child and Adolescent Psychiatry, 49*, 954-963.
- O'Malley, P. M., Johnston, L. D., & Bachman, J. G. (1998). Alcohol use among adolescents. *Alcohol and Youth, 22*, 85-93.
- Parada, M., Corral, M., Caamano-Isorna, F., Mota, N., Crego, A., Rodriguez Holguin, S. et al. (2011). Binge drinking and declarative memory in university students. *Alcoholism: Clinical and Experimental Research, 35*, 1-10.
- Piko, B. (2001). Smoking in adolescence: Do attitudes matter? *Addictive Behaviours, 26*, 201-217.
- Plomin, R., & Caspi, A. (1999). Behavioural genetics and personality. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and Research* (pp. 251-276). New York: Guilford Press Inc.
- Poole, N., & Dell, C. A. (2005). Girls, women, and substance use. Ottawa, ON: Canadian Centre on Substance Abuse [CCSA].
- Prinstein, M. J., Boergers, J., & Spirito, A. (2001). Adolescents' and their friends' health-risk behaviour: Factors that alter or add to peer influence. *Journal of Pediatric Psychology, 26*, 287-298.

- Quadrel, M. J., Fischhoff, B., & Davis, W. (1993). Adolescent (in)vulnerability. *American Psychologist, 48*, 102-116.
- Rehm, J., Gmel, G., Sempos, C. T., & Trevisan, M. (2003). Alcohol-related morbidity and mortality. *Epidemiology in Alcohol Research, 27*, 39-51.
- Roberti, J. W. (2004). A review of behavioural and biological correlates of sensation seeking. *Journal of Research in Personality, 38*, 256-279.
- Rolison, M. R., & Scherman, A. (2003). College student risk-taking from three perspectives. *Adolescence, 38*, 689-705.
- Rubin, Z., & Sloman, J. (1984). How parents influence their children's friendships. In M. Lewis (Ed.), *Beyond the Dyad* (pp. 115-140). New York: Plenum.
- Sanford, M. (2001). The relationship between antisocial behaviour and substance abuse in childhood and adolescence: Implications for aetiology, prevention and treatment. *Current Opinion in Psychiatry, 14*, 317-323.
- Sarkar, S., & Andreas, M. (2004). Acceptance of and engagement in risky driving behaviours by teenagers. *Adolescence, 39*, 687-700.
- Schierman, M. J.; Rowland, G. L. (1985). Sensation-seeking and selection of entertainment. *Personality and Individual Differences, 6*, 599-603.
- Shaw, D. S., Wagner, E. F., Arnett, J., & Aber, M. S. (1992). The factor structure of the Reckless Behaviour Questionnaire. *Journal of Youth and Adolescence, 21*, 305-323.
- Shope, J. T., Waller, P. F., Raghunathan, T. E., & Patil, S. M. (2001). Adolescent antecedents of high-risk driving behavior into young adulthood: Substance use and parental influences. *Accident Analysis and Prevention, 33*, 649-658.

- Simo, S., Perez, J. (1991). Sensation Seeking and antisocial behaviour in a junior student sample. *Personality and Individual Differences, 12*, 965-966.
- Slutske, W. S., Caspi, A., Moffitt, T.E., & Poulton, R. (2005). Personality and problem gambling: A prospective study of a birth cohort of young adults. *Arch. Gen. Psychiatry, 62*, 769-775.
- Spear, H. J., & Kulbok, P. (2004). Autonomy and adolescence: A concept analysis. *Public Health Nursing, 21*, 144-152.
- Substance Abuse and Mental Health Services Administration (SAMHSA) (n.d.). *Communities That Care Prevention Strategy Guide*. from http://download.ncadi.samhsa.gov/Prevline/pdfs/ctc/CTC%20Prevention%20Strategies%20Guide%20_pdf.pdf.
- Tabachnick, B.G., & Fidell, L.S. (2001). *Using Multivariate Statistics* (4th ed.). Needham Heights, MA.: Allyn & Bacon.
- Taubman-Ben-Ari, O., Mikulincer, M., & Gillath, O. (2005). From parents to children--similarity in parents and offspring driving styles. *Transportation Research Part F: Traffic Psychology and Behaviour, 8*, 19-29.
- Teese, R. & Bradley, G. (2008). Predicting recklessness in emerging adults: A test of a psychosocial model. *The Journal of Social Psychology, 148*, 105-126.
- Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behaviour & Organization, 1*, 39-60.
- The Associated Press (2007). California Police Reward Good Drivers With Coffee Retrieved August 8, 2008, from <http://cbs4denver.com/watercooler/safe.drivers.sacramento.2.612778.html>.

- Tucker, J. S., Ellickson, P. L., Collins, R. L., & Klein, D. J. (2006). Are drug experimenters better adjusted than abstainers and users?: A longitudinal study of adolescent marijuana use. *Journal of Adolescent Health, 39*, 488–494.
doi:10.1016/j.jadohealth.2006.03.012
- Ulleberg, P., & Rundmo, T. (2002). Risk-taking attitudes among young drivers: The psychometric qualities and dimensionality of an instrument to measure young drivers' risk-taking attitudes. *Scandinavian Journal of Psychology, 43*, 227-237.
- U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (SAMHSA) (n.d.). National Registry of Evidence-based Programs and Practices (NREPP) Find Interventions Retrieved June 5, 2009, from <http://www.nrepp.samhsa.gov/find.asp>.
- Vodanovich, S. J., & Kass, S. J. (1990). Age and gender differences in boredom proneness. *Journal of Social Behaviour and Personality, 5*, 297-307.
- Vitaro, F., Wanner, B., Brendgen, M., Gosselin, C., & Gendreau, P. L. (2004). Differential contribution of parents and friends to smoking trajectories during adolescence. *Addictive Behaviours, 29*, 831-835.
- Wagner, M. K. (2001). Behavioural characteristics related to substance abuse and risk-taking, sensation-seeking, anxiety sensitivity and self reinforcement. *Addictive Behaviours, 26*, 115-120.
- Walters, S. T., Bennett, M. E., & Noto, J. V. (2000). Drinking on campus: What do we know about reducing alcohol use among college students? *Journal of Substance Abuse Treatment, 19*, 223-228.

- Walton, K. (2004). On the relationship between substance use and personality traits: Abstainers are not maladjusted. *Journal of Research in Personality, 38*, 515-535.
- Wang, M. Q., Fitzhugh, E. C., Westerfield, C., & Eddy, J. M. (1995). Family and peer influences on smoking behaviour among American adolescents: An age trend. *Journal of Adolescent Health, 16*, 200-203.
- Wicks-Nelson, R., & Israel, A. C. (2000). *Behaviour Disorders of Childhood* (4th ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.
- Williams, A. F. (2006). Young driver risk factors: Successful and unsuccessful approaches for dealing with them and an agenda for the future. *Injury Prevention, 12*, i4-i8.
- Wills, T. A., & Dishion, T. J. (2004). Temperament and adolescent substance use: A transactional analysis of emerging self-control. *Journal of Clinical Child and Adolescent Psychology, 33*, 69-81.
- Wills, T. A., Vaccaro, D., McNamara, G. (1994). Novelty seeking, risk taking, and related *constructs* as predictors of adolescent substance use: An application of Cloninger's theory. *Journal of Substance Abuse, 6*, 1-20.
- Windle, M. (2003). Alcohol use among adolescents and young adults. *Epidemiology in Alcohol Research, 27*, 79-85.
- Wood, M. D., Read, J. P., Mitchell, R. E., & Brand, N. H. (2004). Do parents still matter? Parent and peer influences on alcohol involvement among recent high school graduates. *Psychology of Addictive Behaviours, 18*, 19-30.

- Young, M. S., Mahfoud, J. M., Walker, G. H., Jenkins, D. P., Stanton, N. A. (2008). Crash dieting: The effects of eating and drinking on driving performance. *Accident Analysis & Prevention, 40*, 142-148.
- Zimbardo, P. G., Keough, K. A., & Boyd, J. N. (1997). Present time perspective as a predictor of risky driving. *Personality and Individual Differences, 23*, 1007-1023.
- Zuckerman, M., Bone, R. N., Neary, R., Mangelsdorff, D., & Brustman, B. (1972). What is the sensation seeker? Personality trait and experience correlates of the sensation-seeking scales. *Journal of Consulting Clinical Psychology, 39*, 308-321.

Table 1

Correlation matrix for dependent variables

Dependent Variable	1	2	3	4	5
1. Cigarette smoking					
2. Alcohol inebriation	.42**				
3. Marijuana usage	.44**	.59**			
4. Reckless behaviours ^a	.37**	.46**	.49**		
5. Reckless driving ^a	.32**	.31**	.27*	.57**	

^a transformed data, * $p < .01$, ** $p < .001$ (2-tailed), $N = 153$

Table 2.0: Hierarchical Multinomial Logistic Regression Analysis of Cigarette Smoking as a Function of Demographic, Personality, and Social Variables

Variables	χ^2 to Remove^a	df	Model χ^2
Demographic			
Gender	4.40	2	
School	0.26	2	
All demographic variables			2.34
Personality			
Total Sensation Seeking	2.07	2	
Demographic and personality variables			14.42*
Social variables			
Peer Behaviour	10.87**	2	
Parent Behaviour	2.47	2	
Peer Messages	0.71	2	
Parent Messages	3.71	2	
All variables			33.80**
** p < .01			
* p > .01			
N = 203			

^a Note. Chi-Square to Remove values are just for Step 3.

Table 2.1

Hierarchical Multinomial Logistic Regression Analysis of Cigarette Smoking as a Function of Demographic, Personality, and Social Variables (Odds ratios for Tried Smoking category)

Variable	B	Wald	Exp (B)
Step 1			
Gender (0)	-0.10	0.08	0.91
School (1)	-0.19	0.29	0.83
Step 2			
Gender (0)	-0.14	0.16	0.87
School (1)	-0.19	0.29	0.83
Total Sensation Seeking	0.01	0.24	1.01
Step 3			
Gender (0)	-0.20	0.31	0.82
School (1)	-0.11	0.10	0.89
Total Sensation Seeking	0.01	0.02	1.01
Peer Behaviour	0.22	1.36	1.25
Parent Behaviour	-0.02	0.01	0.98
Peer Messages	0.10	0.32	1.11
Parent Messages	-0.12	1.88	0.88

Note. Reference category = Never Smoked.

Gender coded male = 0, female = 1.

School coded Marianopolis = 1, Dawson = 2.

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

N = 203

Table 2.2

Hierarchical Multinomial Logistic Regression Analysis of Cigarette Smoking as a Function of Demographic, Personality, and Social Variables (Odds ratios for Current Smoker category)

Variable	B	Wald	Exp (B)
Step 1			
Gender (0)	-0.49	1.88	0.61
School (1)	-0.06	0.02	0.95
Step 2			
Gender (0)	-0.80	4.43	0.45
School (1)	-0.08	0.04	0.93
Total Sensation Seeking	0.10*	10.25*	1.11*
Step 3			
Gender (0)	-0.81	4.19	0.44
School (1)	0.09	0.06	1.10
Total Sensation Seeking	0.05	1.85	1.05
Peer Behaviour	0.88*	8.33*	2.41*
Parent Behaviour	0.34	1.92	1.41
Peer Messages	0.16	0.63	1.18
Parent Messages	0.08	0.55	1.09

Note. Reference category = Never Smoked.

Gender coded male = 0, female = 1.

School coded Marianopolis = 1, Dawson = 2.

* $p < .01$, ** $p < .001$, $N = 203$

Table 3.0: Hierarchical Multinomial Logistic Regression Analysis of Marijuana Usage as a Function of Demographic, Personality, and Social Variables

Variables	χ^2 to Remove^a	df	Model χ^2
Demographic			
Gender	5.11	2	
School	9.99*	2	
All demographic variables			13.48*
Personality			
Total Sensation Seeking	10.92*	2	
Demographic and personality variables			43.65**
Social variables			
Peer Behaviour	19.97**	2	
Parent Behaviour	4.51	2	
Peer Messages	0.16	2	
Parent Messages	2.14	2	
All variables			72.67**
* p < .01			
** p < .001			
N = 203			

^a Note. Chi-Square to Remove values are just for Step 3.

Table 3.1: Marijuana Usage as a Function of School

	Marijuana Usage^a			Total
	1	2	3	
School				
Marianopolis	66	38	20	124
Dawson	28	23	28	79
Total	94	61	48	203

^a 1 = Never used marijuana; 2 = Tried marijuana;
3 = Currently use marijuana

Table 3.2

Hierarchical Multinomial Logistic Regression Analysis of Marijuana Usage as a Function of Demographic, Personality, and Social Variables (Odds ratios for Tried Marijuana category)

Variable	B	Wald	Exp (B)
Step 1			
Gender (0)	-0.43	1.64	0.65
School (1)	-0.44	1.51	0.65
Step 2			
Gender (0)	-0.74	4.07	0.48
School (1)	-0.53	2.04	0.59
Total Sensation Seeking	0.10*	10.25*	1.11*
Step 3			
Gender (0)	-0.86	4.89	0.42
School (1)	-0.35	0.79	0.70
Total Sensation Seeking	0.06	2.82	1.06
Peer Behaviour	0.76*	10.73*	2.13*
Parent Behaviour	-0.35	1.97	0.70
Peer Messages	-0.03	0.03	0.97
Parent Messages	-0.05	0.26	0.95

Note. Reference category = Never Used.

Gender coded male = 0, female = 1.

School coded Marianopolis = 1, Dawson = 2.

* $p < .01$, ** $p < .001$, $N = 203$

Table 3.3

Hierarchical Multinomial Logistic Regression Analysis of Marijuana Usage as a Function of Demographic, Personality, and Social Variables (Odds ratios for Current Marijuana User category)

Variable	B	Wald	Exp (B)
Step 1			
Gender (0)	0.17	0.21	1.19
School (1)	-1.16*	9.57*	0.31*
Step 2			
Gender (0)	-0.32	0.60	0.72
School (1)	-1.40*	11.52*	0.25*
Total Sensation Seeking	0.19**	21.76**	1.21**
Step 3			
Gender (0)	-0.52	1.31	0.59
School (1)	-1.36*	9.14*	0.26*
Total Sensation Seeking	0.14*	9.55*	1.15*
Peer Behaviour	1.19*	7.52*	3.28*
Parent Behaviour	0.20	0.57	1.22
Peer Messages	-0.10	0.16	0.91
Parent Messages	0.13	1.06	1.14

Note. Reference category = Never Used.

Gender coded male = 0, female = 1.

School coded Marianopolis = 1, Dawson = 2.

* $p < .01$, ** $p < .001$, $N = 203$

Table 4.0: Hierarchical Multinomial Logistic Regression Analysis of Alcohol Inebriation as a Function of Demographic, Personality, and Social Variables

Variables	χ^2 to Remove^a	df	Model χ^2
Demographic			
Gender	5.38	2	
School	3.54	2	
All demographic variables			5.57
Personality			
Total Sensation Seeking	13.73*	2	
Demographic and personality variables			46.90**
Social variables			
Peer Behaviour	21.84**	2	
Parent Behaviour	2.18	2	
Peer Messages	0.34	2	
Parent Messages	1.52	2	
All variables			73.14**
* p < .01			
** p < .001			
N = 203			

^a Note. Chi-Square to Remove values are just for Step 3.

Table 4.1

Hierarchical Multinomial Logistic Regression Analysis of Alcohol Inebriation as a Function of Demographic, Personality, and Social Variables (Odds ratios for Been Drunk category)

Variable	B	Wald	Exp (B)
Step 1			
Gender (0)	-0.07	0.03	0.93
School (1)	-0.07	0.02	0.93
Step 2			
Gender (0)	-0.35	0.55	0.71
School (1)	-0.09	0.03	0.92
Total Sensation Seeking	0.09*	5.40*	1.09*
Step 3			
Gender (0)	-0.45	0.80	0.64
School (1)	0.05	0.01	1.05
Total Sensation Seeking	0.03	0.56	1.03
Peer Behaviour	0.64**	7.69**	1.90**
Parent Behaviour	0.36	1.10	1.44
Peer Messages	-0.01	0.004	0.99
Parent Messages	-0.09	0.53	0.91

Note. Reference category = Never Been Drunk.

Gender coded male = 0, female = 1.

School coded Marianopolis = 1, Dawson = 2.

* $p > .01$, ** $p < .01$, $N = 203$

Table 4.2

Hierarchical Multinomial Logistic Regression Analysis of Alcohol Inebriation as a Function of Demographic, Personality, and Social Variables (Odds ratios for Currently Get Drunk category)

Variable	B	Wald	Exp (B)
Step 1			
Gender (0)	-0.18	0.23	0.83
School (1)	-0.75	3.51	0.47
Step 2			
Gender (0)	-0.85	3.70	0.43
School (1)	-0.88	3.98	0.41
Total Sensation Seeking	0.21**	29.79**	1.24**
Step 3			
Gender (0)	-1.07	4.52	0.35
School (1)	-0.64	1.63	0.53
Total Sensation Seeking	0.14*	9.62*	1.15*
Peer Behaviour	1.07**	18.77**	2.92**
Parent Behaviour	0.48	2.07	1.61
Peer Messages	0.09	0.16	1.10
Parent Messages	-0.14	1.48	0.87

Note. Reference category = Never Been Drunk.

Gender coded male = 0, female = 1.

School coded Marianopolis = 1, Dawson = 2.

* $p < .01$, ** $p < .001$, $N = 203$

Table 5

Summary of Hierarchical Regression Analysis for Variables Predicting Reckless Driving (N = 153)

Variable	B	SE B	β
Step 1			
Gender	-0.11	0.03	-0.27*
School	-0.02	0.03	-0.04
Step 2			
Gender	-0.08	0.03	-0.20
School	-0.02	0.03	-0.04
Total Sensation Seeking	0.10	0.00	0.28**
Step 3			
Gender	-0.07	0.03	-0.18
School	-0.02	0.03	-0.06
Total Sensation Seeking	0.01	0.00	0.19
Peer Behaviour	0.02	0.02	0.10
Parent Behaviour	0.06	0.02	0.23*
Peer Messages	-0.00	0.02	-0.01
Parent Messages	0.00	0.01	0.02

Note. $R^2 = .07$ for Step 1; $\Delta R^2 = .08$ for Step 2 ($ps < .01$); $\Delta R^2 = .07$ for Step 3 ($p = .018$)

* $p < .01$

** $p < .001$

Table 6

Summary of Hierarchical Regression Analysis for Variables Predicting Global Reckless Behaviour (N = 203)

Variable	B	SE B	β
Step 1			
Gender	-0.18	0.05	-0.23*
School	0.11	0.06	0.14
Step 2			
Gender	-0.10	0.05	-0.13
School	0.11	0.05	0.14
Total Sensation Seeking	0.03	0.00	0.46**
Step 3			
Gender	-0.10	0.05	-0.13
School	0.09	0.05	0.11
Total Sensation Seeking	0.02	0.00	0.36**
Peer Behaviour	0.08	0.03	0.21*
Parent Behaviour	0.02	0.03	0.04
Peer Messages	-0.00	0.02	-0.01
Parent Messages	0.02	0.01	0.09

Note. $R^2 = .08$ for Step 1; $\Delta R^2 = .20$ for Step 2; $\Delta R^2 = .05$ for Step 3 ($p < .01$)

* $p < .01$

** $p < .01$

Table 7: Frequencies, means, and standard deviations for significant descriptive, predictor, and outcome variables

Variable	Frequency %	Mean	SD	<u>N</u>
Age		18.32	.67	203
Gender				
Male	53			107
Female	47			96
School				
Marianopolis	61			124
Dawson	39			79
Driver's License				
Yes	76			153
No	24			49
Total Sensation Seeking ^a		19.72	6.14	203
SSSV subscales				
Disinhibition		5.23	2.58	203
Experience Seeking		4.83	2.01	203
Boredom Susceptibility		3.28	1.93	203
Thrill and Adventure Seeking ^a		6.36	2.70	200
Peers who smoke	83			168
Peers who drink	76			155
Peers who use marijuana	77			156
Parent who smokes	28			57
Parent who drinks	80			163
Parent who uses marijuana	10			21
Tried smoking	30			62
Never smoked	43			87
Current smoker	27			54
Been drunk	23			46
Never been drunk	20			41
Currently get drunk	57			116
Tried marijuana	30			61
Never used marijuana	46			94
Currently use marijuana	24			48
Reckless driving ^a		11.07	6.09	153
Reckless behaviours ^a		8.13	6.73	198

^a untransformed data

Appendix A

Demographic Information

Instructions: Please complete the following questions to provide us with information about the range of people that are in our study.

Age: _____

Sex: Male ___ Female ___ Transgender ___

School: _____

I am expected to graduate this year: YES NO

I started smoking when I was _____ years old. N/A

I started drinking alcohol when I was _____ years old. N/A

I started using drugs when I was _____ years old. N/A

I have my driver's license YES NO

I have access to a car on a regular basis YES NO

If YES, how often do you drive? Everyday 3-4 times/wk 1-2 times/wk

Other (please specify): _____

Appendix B
The Reckless Behaviour Questionnaire (RBQ)

For each of the following types of behaviour, indicate how many times you have participated in it *during the past year*.

1. Driven while under the influence of alcohol.

A = 0 times
B = once
C = 2-5 times
D = 6-10 times
E = more than 10 times

2. Had sex without using contraceptives. (Withdrawal and having sex at a “safe” time of the menstrual cycle doesn’t count as contraception.)

A = 0 times
B = once
C = 2-5 times
D = 6-10 times
E = more than 10 times

3. Damaged or destroyed public or private property.

A = 0 times
B = once
C = 2-5 times
D = 6-10 times
E = more than 10 times

4. Used marijuana.

A = 0 times
B = once
C = 2-5 times
D = 6-10 times
E = more than 10 times

5. Shoplifted.

A = 0 times
B = once
C = 2-5 times
D = 6-10 times
E = more than 10 times

Appendix B
The Reckless Behaviour Questionnaire (RBQ)

For each of the following types of behaviour, indicate how many times you have participated in it *during the past year*.

6. Driven a car at over 130 kilometers* per hour.

- A = 0 times
- B = once
- C = 2-5 times
- D = 6-10 times
- E = more than 10 times

7. Had sex with someone you didn't know well.

- A = 0 times
- B = once
- C = 2-5 times
- D = 6-10 times
- E = more than 10 times

8. Used cocaine.

- A = 0 times
- B = once
- C = 2-5 times
- D = 6-10 times
- E = more than 10 times

9. Driven more than 30 kilometers* per hour over the speed limit.

- A = 0 times
- B = once
- C = 2-5 times
- D = 6-10 times
- E = more than 10 times

10. Used illegal drugs other than marijuana or cocaine.

- A = 0 times
- B = once
- C = 2-5 times
- D = 6-10 times
- E = more than 10 times

* Note: converted from miles

Appendix C

The Health Behaviour Survey (HBS)

Please read each question carefully and write your answers on the lines provided or circle the correct response.

1. What is your father's job?

2. What is your mother's job?

3. What is the highest grade in school your father completed?

- 1 = 8th grade or less
- 2 = some high school
- 3 = graduated from high school
- 4 = vocational or business school
- 5 = some college
- 6 = graduated from college
- 7 = attended graduate or professional school

4. What is the highest grade in school your mother completed?

- 1 = 8th grade or less
- 2 = some high school
- 3 = graduated from high school
- 4 = vocational or business school
- 5 = some college
- 6 = graduated from college
- 7 = attended graduate or professional school

5. How many of your close friends smoke cigarettes?

- 1 = none
- 2 = 1
- 3 = 2
- 4 = 3 or 4
- 5 = 5 to 7
- 6 = 8 to 10
- 7 = more than 10

6. How many of your close friends drink alcohol (beer, wine, or liquor)?

- 1 = none
- 2 = 1
- 3 = 2
- 4 = 3 or 4
- 5 = 5 to 7
- 6 = 8 to 10
- 7 = more than 10

Appendix C

The Health Behaviour Survey (HBS)

7. How many of your close friends use marijuana?

- 1 = none
- 2 = 1
- 3 = 2
- 4 = 3 or 4
- 5 = 5 to 7
- 6 = 8 to 10
- 7 = more than 10

8. How many cigarettes have you smoked in your whole life?

- 1 = none
- 2 = I have only had one puff
- 3 = part or all of one cigarette
- 4 = 2 to 4 cigarettes
- 5 = 5 to 20 cigarettes
- 6 = 1 to 5 packs
- 7 = more than 5 packs

9. How many cigarettes have you smoked in the last month (30 days)?

- 1 = none
- 2 = I have only had one puff
- 3 = part or all of one cigarette
- 4 = 2 to 4 cigarettes
- 5 = 5 to 20 cigarettes
- 6 = more than 1 pack

10. How many cigarettes have you smoked in the last week (7 days)?

- 1 = none
- 2 = I have only had one puff
- 3 = part or all of one cigarette
- 4 = 2 to 4 cigarettes
- 5 = 5 to 20 cigarettes
- 6 = more than 1 pack

11. How much do you smoke now?

- 1 = none
- 2 = I used to smoke but now I don't
- 3 = I've only tried a few puffs
- 4 = a few cigarettes a month or less
- 5 = less than a pack a week
- 6 = about a pack a week
- 7 = about half a pack a day
- 8 = a pack a day or more

Appendix C

The Health Behaviour Survey (HBS)

12. If you smoke cigarettes, then do you ever drink alcohol while smoking?

- 1 = yes
- 2 = no
- 3 = I don't smoke

13. If you smoke cigarettes, then do you ever smoke marijuana while smoking?

- 1 = yes
- 2 = no
- 3 = I don't smoke

14. How often are you around young people who are smoking cigarettes?

- 1 = often
- 2 = sometimes
- 3 = hardly ever
- 4 = never

1 ALCOHOL DRINK = 1 BEER = 1 GLASS OF WINE = 1 MIXED DRINK OF LIQUOR

15. How many alcohol drinks have you ever had in your whole life?

- 1 = none
- 2 = only sips
- 3 = part or all of one drink
- 4 = 2 to 4
- 5 = 5 to 10
- 6 = 11 to 20
- 7 = 21 to 100
- 8 = more than 100

16. How many alcohol drinks have you had in the last month (30 days)?

- 1 = none
- 2 = only sips
- 3 = part of all of one drink
- 4 = 2 to 4
- 5 = 5 to 10
- 6 = 11 to 20
- 7 = more than 20

17. How many alcohol drinks have you had in the last week (7 days)?

- 1 = none
- 2 = ½ or less
- 3 = 1
- 4 = 2 to 4
- 5 = 5 to 10
- 6 = 11 or more

Appendix C

The Health Behaviour Survey (HBS)

18. When you drink alcohol, how many drinks do you usually have?

- 1 = none
- 2 = 1 or less
- 3 = 2
- 4 = 3
- 5 = 4
- 6 = 5 or more

19. In the last month (30 days), how many days have you had alcohol to drink?

- 1 = none
- 2 = 1 or less
- 3 = 2 or 3
- 4 = 4 to 7
- 5 = 8 to 14
- 6 = 15 to 30

20. If you drink alcohol, then do you ever smoke marijuana while drinking?

- 1 = yes
- 2 = no
- 3 = I don't drink

21. How often are you around other young people who are drinking alcohol?

- 1 = often
- 2 = sometimes
- 3 = hardly ever
- 4 = never

22. How many times have you used marijuana in your whole life?

- 1 = none
- 2 = once
- 3 = 2 to 4 times
- 4 = 5 to 10 times
- 5 = 11 to 20 times
- 6 = 21 to 100 times
- 7 = more than 100 times

23. How many times have you used marijuana in the last month (30 days)?

- 1 = none
- 2 = once
- 3 = 2 to 4 times
- 4 = 5 to 10 times
- 5 = 11 to 20 times
- 6 = more than 20 times

Appendix C

The Health Behaviour Survey (HBS)

24. How many times have you used marijuana in the last week (7 days)?

- 1 = none
- 2 = once
- 3 = 2 to 4 times
- 4 = 5 to 10 times
- 5 = more than 10 times

25. How often are you around other young people who smoke marijuana?

- 1 = often
- 2 = sometimes
- 3 = hardly ever
- 4 = never

26. Do you think you will smoke a cigarette in the next two months?

- 1 = yes
- 2 = probably
- 3 = I don't know
- 4 = I don't think so
- 5 = no

27. Do you think you will use alcohol in the next two months?

- 1 = yes
- 2 = probably
- 3 = I don't know
- 4 = I don't think so
- 5 = no

28. Have you ever been drunk?

- 1 = no
- 2 = only once
- 3 = 2 to 4 times
- 4 = 5 to 10 times
- 5 = 11 to 20 times
- 6 = more than 20 times

29. In the last month (30 days), how many times have you been drunk?

- 1 = I've never been drunk
- 2 = I've not been drunk in the last month
- 3 = 1 time
- 4 = 2 or 3 times
- 5 = 4 to 6 times
- 6 = 7 to 10 times
- 7 = more than 10 times

Appendix C

The Health Behaviour Survey (HBS)

30. How often are you around young people who are drunk?

- 1 = often
- 2 = sometimes
- 3 = hardly ever
- 4 = never

31. Do you think you will use marijuana in the next couple of (two) months?

- 1 = yes
- 2 = probably
- 3 = I don't know
- 4 = I don't think so
- 5 = no

32. In the last 4 weeks, how many parties have you been to with friends?

- 1 = I don't go to parties
- 2 = none
- 3 = 1 or 2
- 4 = 3 or 4
- 5 = 5 to 7
- 6 = 8 to 10
- 7 = more than 10

33. Competitive sports are team sports like baseball, swimming, basketball, track, etc. How many times did you play a sport like this in the last 7 days (other than gym class)?

- 1 = none
- 2 = 1
- 3 = 2
- 4 = 3 or 4
- 5 = 5 to 7
- 6 = 8 to 10
- 7 = more than 10

34. What grades do you usually get in school?

- 1 = mostly A's
- 2 = A's and B's
- 3 = mostly B's
- 4 = B's and C's
- 5 = mostly C's
- 6 = C's and D's
- 7 = mostly D's
- 8 = D's and F's
- 9 = mostly F's

Appendix C

The Health Behaviour Survey (HBS)

35. How many schools have you gone to since first grade?

- 1 = 1
- 2 = 2
- 3 = 3
- 4 = 4
- 5 = 5
- 6 = more than 5

36. How many people (counting yourself) live in your house?

- 1 = 2
- 2 = 3 or 4
- 3 = 5 or 6
- 4 = 7 or 8
- 5 = 9 or more

37. How many hours a day do you spend watching TV (on an average weekday)?

- 1 = 8 or more
- 2 = 5 to 7
- 3 = 3 or 4
- 4 = 2
- 5 = 1
- 6 = none

38. How often do you attend church, synagogue, or temple?

- 1 = often (about once a week)
- 2 = sometimes
- 3 = hardly ever
- 4 = never

39. How strongly do you believe in your religion?

- 1 = I have no belief
- 2 = I believe a little
- 3 = I believe strongly
- 4 = I believe very strongly

40. Do you live with:

- 1 = both parents
- 2 = only your mother
- 3 = only your father
- 4 = only adult relatives
- 5 = a guardian

Appendix C

The Health Behaviour Survey (HBS)

41. Do you have any older brothers or sisters who smoke?
- 1 = I have no older brothers or sisters
 - 2 = Yes, I have older brothers or sisters, but none smoke
 - 3 = Yes, I have older brothers or sisters who smoke
42. Out of every 100 students your age, how many do you think smoke cigarettes at least once a month?
- 1 = 0
 - 2 = about 10
 - 3 = about 20
 - 4 = about 30
 - 5 = about 40
 - 6 = about 50
 - 7 = about 60
 - 8 = about 70
 - 9 = about 80
 - 10 = about 90
 - 11 = about 100
43. If your best friend offered you a cigarette, how hard would it be to refuse the offer?
- 1 = very hard
 - 2 = hard
 - 3 = easy
 - 4 = very easy
44. If your best friend offered you a cigarette, what would you do?
- 1 = I'm sure I'd smoke it
 - 2 = I'd probably smoke it
 - 3 = I don't know what I would do
 - 4 = I don't think I would smoke it
 - 5 = I would not smoke it
45. Out of every 100 students your age, how many do you think drink alcohol (wine, beer, or liquor) at least once a month?
- 1 = 0
 - 2 = about 10
 - 3 = about 20
 - 4 = about 30
 - 5 = about 40
 - 6 = about 50
 - 7 = about 60
 - 8 = about 70
 - 9 = about 80
 - 10 = about 90
 - 11 = about 100

Appendix C

The Health Behaviour Survey (HBS)

46. If your best friend offered you an alcohol drink, how hard would it be to refuse the offer?

- 1 = very hard
- 2 = hard
- 3 = easy
- 4 = very easy

47. If your best friend offered you an alcohol drink, what would you do?

- 1 = I'm sure I'd drink it
- 2 = I'd probably drink it
- 3 = I don't know what I would do
- 4 = I don't think I would drink it
- 5 = I would not drink it

48. Out of every 100 students your age, how many do you think smoke marijuana at least once a month?

- 1 = 0
- 2 = about 10
- 3 = about 20
- 4 = about 30
- 5 = about 40
- 6 = about 50
- 7 = about 60
- 8 = about 70
- 9 = about 80
- 10 = about 90
- 11 = about 100

49. If your best friend offered you some marijuana, how hard would it be for you to refuse the offer?

- 1 = very easy
- 2 = easy
- 3 = hard
- 4 = very hard

50. If your best friend offered you some marijuana, what would you do?

- 1 = I'm sure I'd smoke it
- 2 = I'd probably smoke it
- 3 = I don't know what I would do
- 4 = I don't think I would smoke it
- 5 = I would not smoke it

Appendix C

The Health Behaviour Survey (HBS)

51. How much do you think seeing people on TV or in magazines can influence young people your age to use tobacco, alcohol, or marijuana?
- 1 = a great deal
 2 = some
 3 = a little
 4 = none at all
52. Does smoking cigarettes make it easier to have a good time with friends?
- 1 = definitely
 2 = probably
 3 = I don't think so
 4 = no
53. Does drinking alcohol make it easier to have a good time with friends?
- 1 = no
 2 = I don't think so
 3 = probably
 4 = definitely
54. Does smoking marijuana make it easier to have a good time with friends?
- 1 = no
 2 = I don't think so
 3 = probably
 4 = definitely
55. In the past year, have you been suspended from school for smoking or using drugs?
- 1 = no
 2 = 1 time
 3 = 2 times
 4 = 3 or more times
56. How would your parents feel if you turned down a chance to drink alcohol, smoke cigarettes, or smoke marijuana?
- 1 = very pleased
 2 = pleased
 3 = somewhat pleased
 4 = not at all pleased

Appendix C

The Health Behaviour Survey (HBS)

57. Has your mother ever given you any of the following messages:

- 0 = none
- 1 = don't drink alcohol
- 2 = don't smoke
- 3 = don't do drugs
- 4 = don't drink and don't smoke
- 5 = don't drink and don't do drugs
- 6 = don't smoke and don't do drugs
- 7 = don't smoke, don't drink, and don't do drugs

58. Has your father ever given you any of the following messages:

- 0 = none
- 1 = don't drink alcohol
- 2 = don't smoke
- 3 = don't do drugs
- 4 = don't drink and don't smoke
- 5 = don't drink and don't do drugs
- 6 = don't smoke and don't do drugs
- 7 = don't smoke, don't drink, and don't do drugs

59. How would your best friends act toward you if you turned down a chance to smoke a cigarette?

- 1 = very unfriendly
- 2 = unfriendly
- 3 = friendly
- 4 = very friendly

60. How would your best friends act toward you if you turned down a chance to drink alcohol?

- 1 = very unfriendly
- 2 = unfriendly
- 3 = friendly
- 4 = very friendly

61. How would your best friends act toward you if you turned down a chance to smoke marijuana?

- 1 = very unfriendly
- 2 = unfriendly
- 3 = friendly
- 4 = very friendly

Appendix C

The Health Behaviour Survey (HBS)

62. Has your best friend ever given you any of the following messages:

- 0 = none
- 1 = don't drink alcohol
- 2 = don't smoke
- 3 = don't do drugs
- 4 = don't drink and don't smoke
- 5 = don't drink and don't do drugs
- 6 = don't smoke and don't do drugs
- 7 = don't smoke, don't drink, and don't do drugs

63. If you had a problem or a question about alcohol, tobacco, or marijuana, how hard would it be to talk to your parents about it?

- 1 = very hard
- 2 = hard
- 3 = easy
- 4 = very easy

64. If you had a problem or a question about alcohol, tobacco, or marijuana, how hard would it be to talk to your friends about it?

- 1 = very hard
- 2 = hard
- 3 = easy
- 4 = very easy

65. Of the two adults who are the most important in your life, how many do you think smoke cigarettes?

- 1 = none
- 2 = 1
- 3 = 2

66. Of the two adults who are the most important in your life, how many do you think drink alcohol?

- 1 = none
- 2 = 1
- 3 = 2

67. Of the two adults who are the most important in your life, how many do you think smoke marijuana?

- 1 = none
- 2 = 1
- 3 = 2

Appendix C

The Health Behaviour Survey (HBS)

68. Of the two adults who are most important in your life, has either ever gotten into trouble for drinking or using drugs?

- 1 = none
- 2 = 1
- 3 = 2

69. Do you care how your parents would act if you used drugs or alcohol?

- 1 = not at all
- 2 = a little
- 3 = somewhat
- 4 = very much

70. Do you care how your best friends would act if you used drugs or alcohol?

- 1 = not at all
- 2 = a little
- 3 = somewhat
- 4 = very much

71. How important is it for you to get good grades?

- 1 = very important
- 2 = important
- 3 = a little important
- 4 = not at all important

72. In general, do you like to take chances?

- 1 = most of the time
- 2 = sometimes
- 3 = hardly ever
- 4 = never

73. Is it worth getting into trouble if you have fun?

- 1 = most of the time
- 2 = sometimes
- 3 = hardly ever
- 4 = never

74. In the past year, how many times have you skipped or cut class?

- 1 = none
- 2 = 1 or 2
- 3 = 3 or 4
- 4 = 5 or 6
- 5 = more than 6 times

Appendix C

The Health Behaviour Survey (HBS)

75. How many times have you tried chewing tobacco or snuff in your whole life?

- 1 = never
- 2 = 1 or 2 times
- 3 = 3 to 5 times
- 4 = 6 to 10 times
- 5 = 11 to 20 times
- 6 = more than 20 times

76. How many times have you used chewing tobacco or snuff in the last month (30 days)?

- 1 = more than 5 times
- 2 = 3 to 5 times
- 3 = 2 times
- 4 = 1 time
- 5 = never

77. How many times have you used chewing tobacco or snuff in the last week (7 days)?

- 1 = more than 5 times
- 2 = 3 to 5 times
- 3 = 2 times
- 4 = 1 time
- 5 = never

78. How many times have you used cocaine (or crack) in your whole life?

- 1 = more than 20 times
- 2 = 11 to 20 times
- 3 = 6 to 10 times
- 4 = 3 to 5 times
- 5 = 1 or 2 times
- 6 = never

79. How often have you used cocaine (or crack) in the last month (30 days)?

- 1 = more than 5 times
- 2 = 3 to 5 times
- 3 = 2 times
- 4 = 1 time
- 5 = not in the last month
- 6 = I never use cocaine

80. Have you ever tried drugs like heroin, morphine, or opium?

- 1 = never
- 2 = yes, but more than 1 year ago
- 3 = yes, between 6 months & 1 year ago
- 4 = yes, between 1 month & 6 months ago
- 5 = yes, 1 to 4 times in the last month
- 6 = yes, 5 or more times in the last month

Appendix C

The Health Behaviour Survey (HBS)

81. Have you ever tried LSD, PCP, or shrooms?

- 1 = never
- 2 = yes, but more than 1 year ago
- 3 = yes, between 6 months & 1 year ago
- 4 = yes, between 1 month & 6 months ago
- 5 = yes, 1 to 4 times in the last month
- 6 = yes, 5 or more times in the last month

82. Have you ever tried “downers” like sleeping pills, barbiturates, tranquilizers, or Quaaludes?

- 1 = never
- 2 = yes, but more than 1 year ago
- 3 = yes, between 6 months & 1 year ago
- 4 = yes, between 1 month & 6 months ago
- 5 = yes, 1 to 4 times in the last month
- 6 = yes, 5 or more times in the last month

83. Have you ever tried “uppers” like speed or amphetamines?

- 1 = never
- 2 = yes, but more than 1 year ago
- 3 = yes, between 6 months & 1 year ago
- 4 = yes, between 1 month & 6 months ago
- 5 = yes, 1 to 4 times in the last month
- 6 = yes, 5 or more times in the last month

84. Have you ever sniffed (not smelled) glue, paint, gasoline, or other inhalants?

- 1 = never
- 2 = yes, but more than 1 year ago
- 3 = yes, between 6 months & 1 year ago
- 4 = yes, between 1 month & 6 months ago
- 5 = yes, 1 to 4 times in the last month
- 6 = yes, 5 or more times in the last month

85. How often are you around people your age who use cocaine (or crack)?

- 1 = often
- 2 = sometimes
- 3 = hardly ever
- 4 = never

86. How many times have you been offered a cigarette in the last month (30 days)?

- 1 = more than 5 times
- 2 = 3 to 5 times
- 3 = 2 times
- 4 = 1 time
- 5 = not in the last month
- 6 = I never smoke cigarettes

Appendix C

The Health Behaviour Survey (HBS)

87. How many times have you been offered a drink of alcohol in the last month (30 days)?

- 1 = more than 5 times
- 2 = 3 to 5 times
- 3 = 2 times
- 4 = 1 time
- 5 = not in the last month
- 6 = I never drink alcohol

88. How many times have you been offered marijuana in the last month (30 days)?

- 1 = more than 5 times
- 2 = 3 to 5 times
- 3 = 2 times
- 4 = 1 time
- 5 = not in the last month
- 6 = I never smoke marijuana

89. How many times did you refuse or choose not to smoke cigarettes in the last month (30 days)?

- 1 = more than 5 times
- 2 = 3 to 5 times
- 3 = 2 times
- 4 = 1 time
- 5 = not in the last month
- 6 = I never smoke cigarettes

90. How many times did you refuse or choose no to drink alcohol in the last month (30 days)?

- 1 = more than 5 times
- 2 = 3 to 5 times
- 3 = 2 times
- 4 = 1 time
- 5 = not in the last month
- 6 = I never drink alcohol

91. How many times did you refuse or choose not to smoke marijuana in the last month (30 days)?

- 1 = more than 5 times
- 2 = 3 to 5 times
- 3 = 2 times
- 4 = 1 time
- 5 = not in the last month
- 6 = I never smoke marijuana

Appendix C

The Health Behaviour Survey (HBS)

92. The last time you were offered a cigarette, how was it offered?

- 1 = I've never been offered a cigarette
- 2 = I was dared to smoke it
- 3 = I was asked to smoke it
- 4 = I was called a name or teased
- 5 = I was asked to be part of a group

93. The last time you were offered a drink of alcohol, how was it offered?

- 1 = I've never been offered alcohol
- 2 = I was dared to drink it
- 3 = I was asked to drink it
- 4 = I was called a name or teased
- 5 = I was asked to be part of a group

94. The last time you were offered marijuana, how was it offered?

- 1 = I've never been offered marijuana
- 2 = I was dared to smoke it
- 3 = I was asked to smoke it
- 4 = I was called a name or teased
- 5 = I was asked to be part of a group

95. The last time you refused to smoke a cigarette when it was offered, how did you refuse?

- 1 = I've never been offered a cigarette
- 2 = I just said no, I didn't want it
- 3 = I said it was bad for me
- 4 = I said I would get into trouble
- 5 = I gave an excuse

96. The last time you refused to drink alcohol when it was offered, how did you refuse?

- 1 = I've never been offered alcohol
- 2 = I just said no, I didn't want it
- 3 = I said it was bad for me
- 4 = I said I would get into trouble
- 5 = I gave an excuse

97. The last time you refused to smoke marijuana when it was offered, how did you refuse?

- 1 = I've never been offered marijuana
- 2 = I just said no, I didn't want it
- 3 = I said it was bad for me
- 4 = I said I would get into trouble
- 5 = I gave an excuse

Appendix C
The Health Behaviour Survey (HBS)

98. If offered a cigarette in the next month, how sure are you that you can say no to the offer?

- 1 = less than 25% sure
- 2 = 25-50% sure
- 3 = 51-75% sure
- 4 = more than 75% sure

99. If offered a drink of alcohol in the next month, how sure are you that you can say no to the offer?

- 1 = less than 25% sure
- 2 = 25-50% sure
- 3 = 51-75% sure
- 4 = more than 75% sure

100. If offered marijuana in the next month, how sure are you that you can say no to the offer?

- 1 = less than 25% sure
- 2 = 25-50% sure
- 3 = 51-75% sure
- 4 = more than 75% sure

THANK YOU FOR YOUR HELP!

Appendix D
The Reckless Driving Measure (RDM)

How often have you done the following when driving a car or motorcycle?

1. Driven while under the influence of alcohol.

1	2	3	4	5	6	7
never			sometimes			frequently

2. Disobeyed a traffic signal or sign (for example, ran a stoplight or stop sign, passed in a “no passing” zone)?

1	2	3	4	5	6	7
never			sometimes			frequently

3. Driven while “under the influence” (of alcohol or other drugs)?

1	2	3	4	5	6	7
never			sometimes			frequently

4. “Horsed around” while driving (for example, squealed tires, drag raced, swerved purposefully, or driven off the road intentionally)?

1	2	3	4	5	6	7
never			sometimes			frequently

5. Failed to use a seatbelt?

1	2	3	4	5	6	7
never			sometimes			frequently

Appendix E
The Sensation Seeking Scale—Form V (SSS-V)

Directions: Each of the items below contains two choices A and B. Please indicate which of the choices most describes your likes or the way you feel. In some cases you may find items in which both choices describe your likes or feelings. Please choose the one which better describes your likes or feelings. In some cases you may find items in which you do not like either choice. In these cases mark the choice you dislike least. Do not leave any items blank. It is important you respond to all items with only one choice, A or B. We are interested only in your likes or feelings, not in how others feel about these things or how one is supposed to feel. There are no right or wrong answers as in other kinds of tests. Be frank and give your honest appraisal of yourself.

1. A. I like “wild” uninhibited parties.
B. I prefer quiet parties with good conversation.
2. A. There are some movies I enjoy seeing a second or even third time.
B. I can’t stand watching a movie that I’ve seen before.
3. A. I often wish I could be a mountain climber.
B. I can’t understand people who risk their necks climbing mountains.
4. A. I dislike all body odors.
B. I like some of the earthy body smells.
5. A. I get bored seeing the same old faces.
B. I like the comfortable familiarity of everyday friends.
6. A. I like to explore a strange city or town by myself, even if it means getting lost.
B. I prefer a guide when I am in a place I don’t know well.
7. A. I dislike people who do or say things just to shock or upset others.
B. When you can predict almost everything a person will do and say he or she must be a bore.
8. A. I usually don’t enjoy a movie or play where I can predict what will happen in advance.
B. I don’t mind watching a movie or play where I can predict what will happen in advance.
9. A. I have tried marijuana or would like to.
B. I would never smoke marijuana.
10. A. I would not like to try any drug which might produce strange and dangerous effects on me.
B. I would like to try some of the drugs that produce hallucinations.

Appendix E
The Sensation Seeking Scale—Form V (SSS-V)

11. A. A sensible person avoids activities that are dangerous.
B. I sometimes like to do things that are a little frightening.
12. A. I dislike “swingers” (people who are uninhibited and free about sex).
B. I enjoy the company of real “swingers”.
13. A. I find that stimulants make me uncomfortable.
B. I often like to get high (drinking liquor or smoking marijuana).
14. A. I like to try new foods that I have never tasted before.
B. I order the dishes with which I am familiar so as to avoid disappointment and unpleasantness.
15. A. I enjoy looking at home movies, videos, or travel slides.
B. Looking at someone’s home movies, videos, or travel slides bores me tremendously.
16. A. I would like to take up the sport of water skiing.
B. I would not like to take up water skiing.
17. A. I would like to try surfboard riding.
B. I would not like to try surfboard riding.
18. A. I would like to take off on a trip with no preplanned or definite routes or timetables.
B. When I go on a trip I like to plan my route and timetable fairly carefully.
19. A. I prefer the “down to earth” kinds of people as friends.
B. I would like to make friends in some of the “far-out” groups like artists or “punks”.
20. A. I would not like to learn to fly an airplane.
B. I would like to learn to fly an airplane.
21. A. I prefer the surface of the water to the depths.
B. I would like to go scuba diving.
22. A. I would like to meet some persons who are homosexual (men or women).
B. I stay away from anyone I suspect of being “gay” or “lesbian”.
23. A. I would like to try parachute jumping.
B. I would never want to try jumping out of a plane, with or without a parachute.

Appendix E
The Sensation Seeking Scale—Form V (SSS-V)

24. A. I prefer friends who are excitingly unpredictable.
B. I prefer friends who are reliable and predictable.
25. A. I am not interested in experience for its own sake.
B. I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal.
26. A. The essence of good art is in its clarity, symmetry of form, and harmony of colors.
B. I often find beauty in the “clashing” colors and irregular forms of modern paintings.
27. A. I enjoy spending time in the familiar surroundings of home.
B. I get very restless if I have to stay around home for any length of time.
28. A. I like to dive off the high board.
B. I don’t like the feeling I get standing on the high board (or I don’t go near it at all).
29. A. I like to date persons who are physically exciting.
B. I like to date persons who share my values.
30. A. Heavy drinking usually ruins a party because some people get loud and boisterous.
B. Keeping the drinks full is the key to a good party.
31. A. The worst social sin is to be rude.
B. The worst social sin is to be a bore.
32. A. A person should have considerable sexual experience before marriage.
B. It’s better if two married persons begin their sexual experience with each other.
33. A. Even if I had the money, I would not care to associate with flighty rich persons in the “jet set”.
B. I could conceive of myself seeking pleasures around the world with the “jet set”.
34. A. I like people who are sharp and witty even if they do sometimes insult others.
B. I dislike people who have their fun at the expense of hurting the feelings of others.
35. A. There is altogether too much portrayal of sex in movies.
B. I enjoy watching many of the “sexy” scenes in movies.

Appendix E
The Sensation Seeking Scale—Form V (SSS-V)

36. A. I feel best after taking a couple of drinks.
B. Something is wrong with people who need liquor to feel good.
37. A. People should dress according to some standard of taste, neatness, and style.
B. People should dress in individual ways even if the effects are sometimes strange.
38. A. Sailing long distances in small sailing crafts is foolhardy.
B. I would like to sail a long distance in a small but seaworthy sailing craft.
39. A. I have no patience with dull or boring persons.
B. I find something interesting in almost every person I talk to.
40. A. Skiing down a high mountain slope is a good way to end up on crutches.
B. I think I would enjoy the sensations of skiing very fast down a high mountain slope.

Appendix F
The Marlowe-Crowne Social Desirability Scale (SDS)

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is *true (T)* or *false (F)* as it pertains to you personally.

1. Before voting I thoroughly investigate the qualifications of all the candidates. T or F
2. I never hesitate to go out of my way to help someone in trouble. T or F
3. It is sometimes hard for me to go on with my work if I am not encouraged. T or F
4. I have never intensely disliked anyone. T or F
5. On occasion I have had doubts about my ability to succeed in life. T or F
6. I sometimes feel resentful when I don't get my way. T or F
7. I am always careful about my manner of dress. T or F
8. My table manners at home are as good as when I eat out in a restaurant. T or F
9. If I could get into a movie without paying and be sure I was not seen I would probably do it. T or F
10. On a few occasions, I have given up doing something because I thought too little of my ability. T or F
11. I like to gossip at times. T or F
12. There have been times when I felt like rebelling against people in authority even though I knew they were right. T or F
13. No matter who I'm talking to, I'm always a good listener. T or F
14. I can remember "playing sick" to get out of something. T or F
15. There have been occasions when I took advantage of someone. T or F
16. I'm always willing to admit it when I make a mistake. T or F
17. I always try to practice what I preach. T or F
18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people. T or F

Appendix F
The Marlowe-Crowne Social Desirability Scale (SDS)

- | | |
|---|--------|
| 19. I sometimes try to get even rather than forgive and forget. | T or F |
| 20. When I don't know something I don't at all mind admitting it. | T or F |
| 21. I am always courteous, even to people who are disagreeable. | T or F |
| 22. At times I have really insisted on having things my own way. | T or F |
| 23. There have been occasions when I felt like smashing things. | T or F |
| 24. I would never think of letting someone else be punished for my wrong-doings | T or F |
| 25. I never resent being asked to return a favor. | T or F |
| 26. I have never been irked when people expressed ideas very different from my own. | T or F |
| 27. I never make a long trip without checking the safety of my car. | T or F |
| 28. There have been times when I was quite jealous of the good fortune of others. | T or F |
| 29. I have almost never felt the urge to tell someone off. | T or F |
| 30. I am sometimes irritated by people who ask favors of me. | T or F |
| 31. I have never felt that I was punished without cause. | T or F |
| 32. I sometimes think when people have a misfortune they only got what they deserved. | T or F |
| 33. I have never deliberately said something that hurt someone's feelings. | T or F |

Appendix G

LETTER OF INFORMATION

Title of the study: Influences on adolescent reckless behaviours: The relative contributions of personality, parents, and peers.

Principal Investigator (Supervisor): Dr. Jane Ledingham
Full Professor
School of Psychology
University of Ottawa
Ottawa, ON
(613) 562-5800 ext. 4453

Co-investigator (Student): Cheryl Blum

You are invited to participate in the abovementioned research study conducted by Cheryl Blum, who is being supervised by Dr. Jane Ledingham. The purpose of this study is to find out about the influences of personality, parents, and peers on behaviours, such as smoking, drinking, drug use, and driving.

If you wish to participate in this study, please complete the attached survey. Your decision to complete and return this survey will be interpreted as an indication of your consent to participate. The survey should take you approximately an hour to complete. You do not have to answer any questions that you do not want to answer. Once you have completed the survey, please return it to the researcher.

The survey includes personal questions about your parents', your friends', and your own experiences with alcohol, smoking, drugs, and driving. Since some of the questions are about personal things, you might feel uncomfortable. If this happens, you may refuse to answer any questions and you may get out of the study at any time without any penalty.

If you need to talk to someone after completing the questionnaires, the school guidance counselors will be available to talk with you. If you would like to speak with someone else, you can contact the Kids Help Phone (24 hours per day) at 1-800-668-6868. You can also contact Alcoholics Anonymous at 376-9230, Drugs: Help and Referral at 527-2626, and/or the Stop Smoking Line at 1-888-853-6666 (all available 24 hours per day, as well).

All the information collected will remain strictly confidential. In other words, only the members of the research team will see this information. In reporting the findings, the research team will only discuss a summary of everyone's results. Anonymity is guaranteed since you are not being asked to provide your name. The surveys will be kept in a locked filing cabinet in the office of the researcher at the University of Ottawa for a period of 10 years at which time they will be destroyed.

You will receive a \$5.00 gift certificate to a movie theatre for your participation in this study.

If you have any questions or require more information about the study itself, you may contact the researcher or his/her supervisor at the numbers mentioned hereinabove.

If you have any questions with regards to the ethical conduct of this study, you may contact the Protocol Officer for Ethics in Research, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 159, Ottawa, ON K1N 6N5, tel.: (613) 562-5841 or ethics@uottawa.ca.

Please keep this form for your records.

Thank you for your time and consideration.

Appendix H

INFORMED CONSENT FORM

I, _____, am interested in being part of a study on the influences on health behaviours being done by researchers from the University of Ottawa. The purpose of this study is to find out about the influence of parents and peers on behaviours, such as smoking, drinking, drug use, and driving.

I have been told that the questionnaire will ask about my background, my health behaviours, and some personal questions about me, my parents, and my friends. I am aware that that the questionnaire will ask about my experiences with alcohol, smoking, drugs, driving, and sex. Since some of the questions are about personal things, I understand that they might make me feel uncomfortable. If this happens, I can refuse to answer any questions and I can get out of the study at any time without any penalty.

It was explained to me that all the information collected will remain strictly confidential. In other words, only the members of the research team will see this information. In reporting the findings, I have been told that the research team will only discuss a summary of everyone's results. They will never reveal the identity of those participating in the study.

If I need to talk to someone after completing the questionnaires, I understand that Dawson College cannot provide counseling services; however, I can contact the Kids Help Phone (24 hours per day) at 1-800-668-6868. I can also contact Alcoholics Anonymous at 376-9230, Drugs: Help and Referral at 527-2626, and/or the Stop Smoking Line at 1-888-853-6666 (all available 24 hours per day, as well). Please initial here to indicate that you have read and understood that there are services available to you _____.

I have been told that I will receive a \$5.00 gift certificate to 2nd Cup upon completion of the questionnaire.

There are 2 copies of the consent form, one that the researchers keep and one that I keep. If I have any questions or concerns about this study, I can call Dr. Jane Ledingham, the supervisor of the study, at the University of Ottawa at (613) 562-5800 extension 4453 or Cheryl Blum, the primary investigator, at the University of Ottawa at (613) 562-5800 extension 4446.

By signing below, I agree to be part of this study.

PARTICIPANT'S SIGNATURE:

DATE:

Appendix I

Correlations

		Gender (no missing cases)	School	Total Sensation Seeking	Total number of substances peers use	# of adults who use substances	# of substances peers warned about	combined # of substances mom and dad warned about	Are you in the habit of getting drunk?
Gender (no missing cases)	Pearson Correlation	1	-.189**	-.218**	-.125	-.088	.118	.055	.007
	Sig. (2-tailed)		.007	.002	.076	.214	.093	.437	.926
	N	203	203	203	203	203	203	199	203
School	Pearson Correlation	-.189**	1	.040	.159*	.067	-.033	-.092	.150*
	Sig. (2-tailed)	.007		.575	.023	.341	.635	.195	.033
	N	203	203	203	203	203	203	199	203
Total Sensation Seeking	Pearson Correlation	-.218**	.040	1	.471**	.216**	-.133	-.104	.419**
	Sig. (2-tailed)	.002	.575		.000	.002	.059	.143	.000
	N	203	203	203	203	203	203	199	203
Total number of substances peers use	Pearson Correlation	-.125	.159*	.471**	1	.224**	-.066	.026	.505**
	Sig. (2-tailed)	.076	.023	.000		.001	.352	.717	.000
	N	203	203	203	203	203	203	199	203
# of adults who use substances	Pearson Correlation	-.088	.067	.216**	.224**	1	-.021	-.038	.220**
	Sig. (2-tailed)	.214	.341	.002	.001		.765	.597	.002
	N	203	203	203	203	203	203	199	203
# of substances peers warned about	Pearson Correlation	.118	-.033	-.133	-.066	-.021	1	.290**	-.024
	Sig. (2-tailed)	.093	.635	.059	.352	.765		.000	.739
	N	203	203	203	203	203	203	199	203
combined # of substances mom and dad warned about	Pearson Correlation	.055	-.092	-.104	.026	-.038	.290**	1	-.093
	Sig. (2-tailed)	.437	.195	.143	.717	.597	.000		.192
	N	199	199	199	199	199	199	199	199
Are you in the habit of getting drunk?	Pearson Correlation	.007	.150*	.419**	.505**	.220**	-.024	-.093	1
	Sig. (2-tailed)	.926	.033	.000	.000	.002	.739	.192	
	N	203	203	203	203	203	203	199	203

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Correlations

		Gender (no missing cases)	School	Total Sensation Seeking	Total number of substances peers use	# of adults who use substances	# of substances peers warned about	combined # of substances mom and dad warned about	DV Total Reckless Behavior Questionnaire
Gender (no missing cases)	Pearson Correlation	1	-.189**	-.218**	-.125	-.088	.118	.055	-.251**
	Sig. (2-tailed)		.007	.002	.076	.214	.093	.437	.000
	N	203	203	203	203	203	203	199	203
School	Pearson Correlation	-.189**	1	.040	.159*	.067	-.033	-.092	.179*
	Sig. (2-tailed)	.007		.575	.023	.341	.635	.195	.011
	N	203	203	203	203	203	203	199	203
Total Sensation Seeking	Pearson Correlation	-.218**	.040	1	.471**	.216**	-.133	-.104	.490**
	Sig. (2-tailed)	.002	.575		.000	.002	.059	.143	.000
	N	203	203	203	203	203	203	199	203
Total number of substances peers use	Pearson Correlation	-.125	.159*	.471**	1	.224**	-.066	.026	.428**
	Sig. (2-tailed)	.076	.023	.000		.001	.352	.717	.000
	N	203	203	203	203	203	203	199	203
# of adults who use substances	Pearson Correlation	-.088	.067	.216**	.224**	1	-.021	-.038	.184**
	Sig. (2-tailed)	.214	.341	.002	.001		.765	.597	.009
	N	203	203	203	203	203	203	199	203
# of substances peers warned about	Pearson Correlation	.118	-.033	-.133	-.066	-.021	1	.290**	-.061
	Sig. (2-tailed)	.093	.635	.059	.352	.765		.000	.388
	N	203	203	203	203	203	203	199	203
combined # of substances mom and dad warned about	Pearson Correlation	.055	-.092	-.104	.026	-.038	.290**	1	.038
	Sig. (2-tailed)	.437	.195	.143	.717	.597	.000		.593
	N	199	199	199	199	199	199	199	199
DV Total Reckless Behavior Questionnaire	Pearson Correlation	-.251**	.179*	.490**	.428**	.184**	-.061	.038	1
	Sig. (2-tailed)	.000	.011	.000	.000	.009	.388	.593	
	N	203	203	203	203	203	203	199	203

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Correlations

		Gender (no missing cases)	School	Total Sensation Seeking	Total number of substances peers use	# of adults who use substances	# of substances peers warned about	combined # of substances mom and dad warned about	Are you a marijuana user?
Gender (no missing cases)	Pearson Correlation Sig. (2-tailed) N	1 .007 203	-.189** .007 203	-.218** .002 203	-.125 .076 203	-.088 .214 203	.118 .093 203	.055 .437 199	-.052 .461 203
School	Pearson Correlation Sig. (2-tailed) N	-.189** .007 203	1 .007 203	.040 .575 203	.159* .023 203	.067 .341 203	-.033 .635 203	-.092 .195 199	.225** .001 203
Total Sensation Seeking	Pearson Correlation Sig. (2-tailed) N	-.218** .002 203	.040 .575 203	1 .000 203	.471** .000 203	.216** .002 203	-.133 .059 203	-.104 .143 199	.356** .000 203
Total number of substances peers use	Pearson Correlation Sig. (2-tailed) N	-.125 .076 203	.159* .023 203	.471** .000 203	1 .000 203	.224** .001 203	-.066 .352 203	.026 .717 199	.424** .000 203
# of adults who use substances	Pearson Correlation Sig. (2-tailed) N	-.088 .214 203	.067 .341 203	.216** .002 203	.224** .001 203	1 .001 203	-.021 .765 203	-.038 .597 199	.176* .012 203
# of substances peers warned about	Pearson Correlation Sig. (2-tailed) N	.118 .093 203	-.033 .635 203	-.133 .059 203	-.066 .352 203	-.021 .765 203	1 .000 203	.290** .000 199	-.060 .396 203
combined # of substances mom and dad warned about	Pearson Correlation Sig. (2-tailed) N	.055 .437 199	-.092 .195 199	-.104 .143 199	.026 .717 199	-.038 .597 199	.290** .000 199	1 .696 199	.028 .696 199
Are you a marijuana user?	Pearson Correlation Sig. (2-tailed) N	-.052 .461 203	.225** .001 203	.356** .000 203	.424** .000 203	.176* .012 203	-.060 .396 203	.028 .696 199	1 .696 203

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Correlations

		Gender (no missing cases)	School	Total Sensation Seeking	Total number of substances peers use	# of adults who use substances	# of substances peers warned about	combined # of substances mom and dad warned about	DV Total Reckless Driving Measure (no missing cases)
Gender (no missing cases)	Pearson Correlation Sig. (2- tailed) N	1 .029 153	-.177* .029 153	-.226** .005 153	-.108 .186 153	-.140 .083 153	.108 .183 153	.100 .222 150	-.258** .001 153
School	Pearson Correlation Sig. (2- tailed) N	-.177* .029 153	1 .775 153	.023 .775 153	.160* .048 153	.034 .674 153	-.110 .175 153	-.121 .141 150	.004 .962 153
Total Sensation Seeking	Pearson Correlation Sig. (2- tailed) N	-.226** .005 153	.023 .775 153	1 .000 153	.412** .000 153	.233** .004 153	-.190* .019 153	-.082 .317 150	.329** .000 153
Total number of substances peers use	Pearson Correlation Sig. (2- tailed) N	-.108 .186 153	.160* .048 153	.412** .000 153	1 .000 153	.245** .002 153	-.118 .147 153	.019 .817 150	.251** .002 153
# of adults who use substances	Pearson Correlation Sig. (2- tailed) N	-.140 .083 153	.034 .674 153	.233** .004 153	.245** .002 153	1 .591 153	-.044 .591 153	-.024 .771 150	.326** .000 153
# of substances peers warned about	Pearson Correlation Sig. (2- tailed) N	.108 .183 153	-.110 .175 153	-.190* .019 153	-.118 .147 153	-.044 .591 153	1 .591 153	.253** .002 150	-.080 .325 153
combined # of substances mom and dad warned about	Pearson Correlation Sig. (2- tailed) N	.100 .222 150	-.121 .141 150	-.082 .317 150	.019 .817 150	-.024 .771 150	.253** .002 150	1 .002 150	-.016 .849 150
DV Total Reckless Driving Measure (no missing cases)	Pearson Correlation Sig. (2- tailed) N	-.258** .001 153	.004 .962 153	.329** .000 153	.251** .002 153	.326** .000 153	-.080 .325 153	-.016 .849 150	1 153

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Are you a smoker?	Gender (no missing cases)	School	Total Sensation Seeking	Total number of substances peers use	# of adults who use substances	# of substances peers warned about	# of substances mom warned about
Are you a smoker?	Pearson Correlation	1	.092	-.002	.193**	.273**	.155*	.055	.015
	Sig. (2-tailed)		.193	.978	.006	.000	.027	.440	.834
	N	203	203	203	203	203	203	203	201
Gender (no missing cases)	Pearson Correlation	.092	1	-.189**	-.218**	-.125	-.088	.118	.049
	Sig. (2-tailed)	.193		.007	.002	.076	.214	.093	.485
	N	203	203	203	203	203	203	203	201
School	Pearson Correlation	-.002	-.189**	1	.040	.159*	.067	-.033	-.114
	Sig. (2-tailed)	.978	.007		.575	.023	.341	.635	.107
	N	203	203	203	203	203	203	203	201
Total Sensation Seeking	Pearson Correlation	.193**	-.218**	.040	1	.471**	.216**	-.133	-.052
	Sig. (2-tailed)	.006	.002	.575		.000	.002	.059	.461
	N	203	203	203	203	203	203	203	201
Total number of substances peers use	Pearson Correlation	.273**	-.125	.159*	.471**	1	.224**	-.066	.071
	Sig. (2-tailed)	.000	.076	.023	.000		.001	.352	.319
	N	203	203	203	203	203	203	203	201
# of adults who use substances	Pearson Correlation	.155*	-.088	.067	.216**	.224**	1	-.021	-.004
	Sig. (2-tailed)	.027	.214	.341	.002	.001		.765	.954
	N	203	203	203	203	203	203	203	201
# of substances peers warned about	Pearson Correlation	.055	.118	-.033	-.133	-.066	-.021	1	.238**
	Sig. (2-tailed)	.440	.093	.635	.059	.352	.765		.001
	N	203	203	203	203	203	203	203	201
# of substances mom warned about	Pearson Correlation	.015	.049	-.114	-.052	.071	-.004	.238**	1
	Sig. (2-tailed)	.834	.485	.107	.461	.319	.954	.001	
	N	201	201	201	201	201	201	201	201

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).