The Effects of School Work Pressure on Depression and Substance Use: A Cross-National Study of School-Aged Children in Canada and Finland

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The Effects of School Work Pressure on Depression and Substance Use: A Cross-National Study of School-Aged Children in Canada and Finland

by

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A THESIS
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Abstract

Studies suggest that adolescents report a variety of academic stressors, which can have detrimental effects on mental health. Using the Health Behaviour in School-Aged Children survey (2005/6 data), this study provides an analysis of the effects of school work pressures on depressive symptomology and substance use in adolescents in Canada and Finland. Using Pearlin’s stress process framework, the study also examines how socio-demographic indicators affect these stress outcomes. Results indicate that regardless of context, school work pressure negatively affects the mental health of students net of all socio-demographic indicators. However, this relationship is stronger in Finland than in Canada. Secondary results show that depressive symptomology is associated with smoking and alcohol consumption in both countries. School work pressure, however, only has an additional effect on the likelihood to drink alcohol among students in Finland. Ultimately, this study demonstrates that the mechanisms through which the stress process model operates differs by national context.
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To the best grandma anyone could ever have, my Mama Chula
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Introduction

This thesis will provide a sociological examination of one specific mental health outcome in adolescence: depression. Depression is a mental disorder, the symptoms of which can include unhappy mood, loss of interest/pleasure, decreased energy, feelings of guilt, low self-worth, disturbed sleep and appetite and poor concentration. While depression can present itself in many forms, it is also often associated with feelings of anxiety. A public health concern is that depression can lead to suicidal ideation or even to suicide (World Federation for Mental Health, 2012). There is evidence to suggest that depression occurs with considerable frequency in childhood and adolescence (Ustun et al., 2004). Over the past two decades, research has shown that depression among children and adolescents is rapidly increasing. There is evidence to suggest that schoolchildren as young as 7-12 years old show symptoms of depression. However, the prevalence of depression is higher among adolescents aged 12-18 years of age (Avenevoli, Knight, Kesller & Merikangas, 2008).

This research project generally examines school-aged children but will primarily explore correlates of depression in adolescents. The World Health Organization (WHO) defines adolescence as the time between childhood and adulthood, between the ages of 10-18 years of age (WHO, 2015). It is essential to engage in a study of adolescents because it is a time period in individuals’ lives where there are tremendous changes physically, sexually, psychologically and emotionally. It is a transitional time physically, characterized by the onset of puberty. It is also a transitional time socially in children’s lives, where there are tremendous pressures to engage in many high risk behaviours (WHO, 2015). Most research on adolescent depression measures this period around the ages of 10-18 (Ang & Huan, 2006; Anderman, 2002; Avenevoli et al., 2008; Davis, Tang & Ko, 2002; Hankin & Abramson, 2001; Karvonen & Rimpela, 2005; Lee &
Larson, 2000; Low et al., 2012; Ustun et al., 2004; Wolff & Ollendick, 2006). This age range and transition coincides with the age range of participants involved in the data that were used for this project. Therefore, this project will explore the literature on depressive symptoms and substance use among this particular group of individuals.

While there are varying estimates of the prevalence of major depression among adolescents worldwide (Avenevoli et al., 2008), reports by the WHO state that depression – broadly defined to include pure depression and mixed anxiety – affects approximately 5-10% of adolescents in the world (World Federation for Mental Health, 2012). Longitudinal studies in high income nations have shown that if depression in adolescence is left unattended, depression can have longstanding social and economic implications in adulthood, including lower levels of educational attainment, increased criminal involvement, higher levels of unemployment and difficulties with personal relationships (World Federation for Mental Health, 2012). What is of particular interest in this research is that among adolescents, depression can also be associated with dangerous risk taking behaviours such as alcohol consumption, smoking, drug usage and suicide (Wolff & Ollendick, 2006). As well as the costs incurred by the health system, the largest additional societal costs of depression among adolescents come from criminal justice services and extra educational provisions (Henderson, Henderson, Lavikainen & McDaid, 2004).

Many risk factors for depression have been highlighted, including biological factors, emotional difficulties, family circumstances, interpersonal problems and school problems (Greenberg, Domitrovish & Bumbarger, 2001). This thesis does not attempt to account for all the risk factors affecting depression, but rather to understand how social factors affect the relationship between one particular risk factor (school work pressure) and depression among adolescents in two different national settings. Literature suggests that risk factors (also known as
stressors) affect mental health (including stress outcomes such as depressive symptomology) because they interfere with individuals being able to fulfil social roles. The relationships between risk factors and mental health outcomes are also affected by socioeconomic indicators that play a role in determining how individuals experience these stressors and stress outcomes (Pearlin & Bierman, 2013; Pearlin, Schieman, Fazio & Meersman, 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin, Menaghan, Lieberman & Mullan, 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995). Based on this theoretical framework, this thesis argues that the stressor of school work pressure affects depressive symptomology among adolescent populations because it creates problems for adolescents in terms of being able to fulfil the role of a student. I add to the existing literature in this area of research by comparing results in Canada and Finland, and suggest that although the role of the stressor on a stress outcome may be similar between both contexts in general, there are aspects of this relationship that will be different due to the different cultural, historical, political and educational environments that adolescents experience between the two contexts. Furthermore, I examine the relationship between depression and behavioural outcomes (smoking and alcohol use) among the adolescents in my two samples.

This area of research is of great relevance to society today because there is great international interest in comparing the academic success of adolescents worldwide (OECD, n.d.). There are books that have been published comparing educational systems and the stresses that adolescents experience in different national contexts (Ripley, 2013). Many educational boards now acknowledge the stresses and workloads that adolescents go through in school and recognize that these stresses may have detrimental effects on the health of adolescents (Alberta Education, 2015; Wilmott, 2014). This research is necessary in order to gain more insight into the effect of school work pressure on adolescent mental and physical health, and in order to
evaluate whether there are aspects of an individual’s socio-economic positioning that play a role in determining how adolescents experience these stresses. Ultimately, we must understand how school stresses affect the well-being of adolescents from different social and economic backgrounds, and in different contexts.

This thesis begins with a discussion of the theoretical framework that guides the study, the stress process model. Chapter 1 also includes a brief overview of the two national settings for the study: Finland and Canada. In Chapter 2, I review the literature that has guided this study of school work pressure and its effect on depressive symptomology and behavioural outcomes. In Chapter 3, I discuss the methodology used to conduct this study. This chapter includes a more in-depth look at the Health Behaviour in School-Aged Children data that is used in this thesis to evaluate these relationships of interest. This chapter also explains the governing research questions and the variables used to measure the concepts that are of interest in this study. Chapter 4 examines the results and provides an analysis of the findings. The thesis concludes with a chapter summarizing of the central findings, the limitations of this study, and some suggestions about what future research should consider.
Chapter 1: Literature Review: Theoretical & Contextual Background

1.1 Theoretical Framework

This project will use aspects of the stress process model to explain socioeconomic disparities in mental health outcomes among adolescents. The stress process model, first explicated by Pearlin et al. (1981), is a sociological model that suggests that mental health outcomes are affected by people’s placement in social and economic statuses. It suggests that there are three different conceptual realms which must be considered to understand how stress affects individuals. These include: stressors; stress mediators/psycho-social resources; and stress outcomes (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995). Pearlin argues that individuals have varying levels of psychosocial resources to cope with the stressors they experience, and present different levels of stress outcomes depending on their location in macro-structural stratification systems such as sex, social class, ethnicity, and age (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981). Socio-demographic variables influence every stage in the stress process (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981). This project examines the relationship between a specific stressor (school work pressure) and a specific stress outcome (depressive symptoms) among adolescents in two different settings, Canada and Finland. The project focuses on how the relationship between the stressor and the outcome may change based on the social and economic position of adolescents. Although this project does not incorporate measures of psychosocial resources as mediators in the models, I conclude by suggesting several mediators which could be considered in future research.
The next section of the literature review elaborates further on the separate concepts within the stress process framework used in this project.

1.1.1 Stressors

Research using the stress process model suggests that stressors are circumstances or experiences that are difficult to adjust to and that have negative impacts on emotions, wellbeing and psychological functioning (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995). There are two types of stress that individuals may face: experiential circumstances or eventful experiences; and chronic/life stressors (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995). Experiential stressors are those that occur only once in an individual’s life and may trigger or magnify a set of other stressors (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995). Chronic stressors are continuous and can have harmful effects throughout individuals’ lives (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995).

Pearlin (1989) suggests that sociologists are more interested in studying chronic stress because it often results from an individual’s position in the social structure. Chronic stress becomes a problem when it interferes with the roles to which individuals are assigned. There are many different types of role strain suggested by Pearlin (1989). This project will examine role overload strain. This is strain where the demands of a role exceed the individual’s capacities to
fulfill the role assigned to them (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995).

Pearlin & Bierman (2013) state that stressors can arise from multiple contexts of social life. This project will focus on the context of schooling, since one of the primary roles that are assigned to school-aged children is the role of a student (Burnett & Fanshawe, 1996; deAnda et al., 2000; deAnda et al., 1997). Adolescents spend a majority of their time in schools, and it is these institutions that place demands on adolescents based on the student role (Burnett & Fanshawe, 1996; deAnda et al., 2000; deAnda et al., 1997). Studies have found that the stressors that are of highest frequency in an adolescent’s daily life are school related or academic stressors. These stressors can include schoolwork demands, exams, homework, tests, grades, difficulty of classwork and pressures placed on them from parents and teachers about the future (Burnett & Fanshawe, 1996; deAnda et al., 2000; deAnda et al., 1997). Research shows that these stressors can cause significant strain in adolescents’ lives (Burnett & Fanshawe, 1996; deAnda et al., 2000; deAnda et al., 1997).

1.1.2 Stress Outcomes

A stress outcome arises from strain that is caused by a stressor (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995). Sociologists commonly study how stressors affect health histories, symptoms of physical health, symptoms of mental health, abuse of alcohol or other substances, fulfillment of role obligations and social relationships (Pearlin, 1989: p. 253). Pearlin et al. (1981) state that depression is an important stress outcome that should be studied
using the stress process model (p.342). Depression is the most common form of psychological
distress and is widely responsive to social and economic conditions (Pearlin & Bierman, 2013;
Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Turner & Lloyd, 1999; Turner,
Wheaton & Lloyd, 1995). Depression is also an important outcome to study because it is
associated with wide ranging social consequences such as increased risk of alcohol and
substance abuse (Turner & Lloyd, 1999). In the context of adolescents, research identifies that
high rates of depression correspond to an increase in stressors in the lives of adolescents (Keyes,
2006; DeSocio & Hootman, 2004; Larson & Verman, 1999; Lin & Chen, 1995; Phelan,
Davidson & Cao, 1994; Matheny, Aycock, McCarthy, 1993). Stressors that occur on a day to day
basis, such as the academic and school work stressors, have clear effects on mental health,
academic performance and the ability to cope as young person (Ang & Huan, 2006; Anderman,
2002; Davis et al, 2002; Karvonen & Rimpela, 2005; Lee & Larson, 2000; Low et al., 2012).

1.1.3 Extensions of the Stress Process

Following the examination of the impact of school work pressure on depression, this
project will also examine the effects of depression on substance usage. Turner & Lloyd (1999)
show that depression and depressive symptomology may result in an increased risk of alcohol
and substance abuse. Other research also suggests that stress outcomes, in particular depression,
can lead to behavioral outcomes such as substance abuse (Boys et al., 2003; Dierker, Avenevoli,
Stolar & Merikangas, 2002; Goodman & Capitman, 2000; King, Iacono & McGue, 2004; Kwon,
2013; Mayfield Arnold, Greco, Desmond & Rotheram-Borus, 2014; Nation & Heflinger, 2006;
Patton et al., 1996; Pederson, Koval & O’Connor, 1997; Tyas & Pederson, 1998). Based on these
findings, this research will evaluate the effects of depressive symptomology on alcohol usage
and smoking among adolescents in Canada and Finland.
Previous research shows that the stress process model is a model that can be used in many different scenarios to study the effects of stressors on stress outcomes and the socioeconomic factors that influence this process (Foster & Brooks-Gunn, 2009; Goode, Haley, Roth & Ford, 1998; Green, 2008; Haley, LaMonde, Han, Burton & Schonwetter, 2003; Noh & Avison, 1996). Adding to this literature of the stress process, my project will explore how the stress process model may work differently in different cultural contexts. My research will go beyond socioeconomic factors and will assess whether the overall national context affects the relationships among stressors, stress outcomes, socioeconomic factors and behavioural outcomes. Using the same measures and the same models across two different datasets, I will observe whether there are differences in these relationships in two different national contexts: Canada and Finland.

In summary, my research will attempt to use aspects of the stress model such as stressors and stress outcomes (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995) to evaluate the relationship between the focal variables of school work pressure as a stressor and depression, measured through symptomology as a stress outcome. I will use relevant socio-demographic variables to evaluate how they affect school work pressure and depression and incorporate them into models to explore how depression varies through these indicators. I will then extend these models to assess whether school work pressure and depression affect alcohol consumption and smoking. I will suggest that these relationships are also affected and structured through socio-demographic indicators. Finally, as mentioned I am also interested in exploring whether the national context plays a role in the stress process model. In order to make this comparison, it is important to get a contextual understanding of the countries in this project by
exploring relevant demographic data for each country. The following sections of the literature review will explore the differences between Canada and Finland in order to get a contextual understanding of each country.

1.2 Context: Canada and Finland

In order to engage in a comparative analysis between Canada and Finland, the following section will provide a contextual background for each country. I will compare statistics primarily from the 2013 & 2014 *Human Development Report* on development, inequalities, family demographics, and education in Canada and Finland. This report has been published annually by the United Nations Development program (UNDP) since the 1990s. It is a report that is independent and empirically based and outlines the trends of development and policies of countries (UNDP, 2014). The statistics for each of these measures are provided by different governing bodies affiliated with the development program.

1.2.1 Country Development and Inequality

Canada and Finland were chosen for comparison because they are both considered countries that belong in the very high human development category in terms of international comparisons of development (UNDP, 2014). It is important that they are in the same category in this comparative analysis because health outcome patterns vary widely with a country’s level of development (UNDP, 2013, 2014). The human development index (HDI) is a measure that ranges from low development or 0 to high development or 1 (UNDP, 2011). For Canada this value is 0.902 and for Finland it is 0.879 (UNDP, 2014). Canada is ranked 8th best internationally in terms of human development and Finland is ranked 24th (UNDP, 2014). Both countries have high life expectancies, high rates of education and literacy and a high standard of living (based
on per capita income) (UNDP, 2014). Canada surpasses Finland in average income, resulting in a higher HDI for Canada. However, Finland has a more egalitarian distribution of income than Canada. The inequality-adjusted human development index (IHDI) measure adjusts the HDI for inequality in the distribution of each dimension across the population (UNDP, 2011). This measure takes into account how health, education and income are distributed across a country’s residents. Once inequality is taken into account, the measure of development between Canada and Finland becomes almost identical; Canada and Finland have an IHDI of 0.833 and 0.830 respectively (UNDP, 2014). This finding coincides with the comparison between the Gini coefficients in both countries. The Gini coefficient is a coefficient that ranges from 0 which represents absolute equality and 100 which represents absolute inequality. It measures the deviation of the distribution of income among individuals/households from a perfectly equal distribution (UNDP, 2014). These numbers show that the gap between the rich and poor (inequality) is smaller for Finland than for Canada; Finland has a lower Gini coefficient than Canada (26.9 vs. 32.6) (UNDP, 2014). These differences can be attributed to the fact that Scandinavian nations such as Finland have what is known as a more universal welfare system as compared to Canada, which has a welfare system that is considered mixed (Bonoli, 1997; Pierson & Castles, 2006). Scandinavian countries such as Finland advocate for universalism and de-commodification of social rights and in turn make them socially democratic (Pierson & Castles, 2006). Canada, although having founding principles based on a welfare state, has become a more “liberal” welfare state, which implies that the influence of the market is more salient than in Scandinavia and thus resulting in more inequality in Canada (Pierson & Castles, 2006). Interestingly, while Canadians report a slightly higher percentage of satisfaction towards their standard of living (86% vs. 82%), both Finns and Canadians report the same level of life
satisfaction. Individuals in both countries report a life satisfaction value of 7.4 on a scale from 1-10 where 1 represents least satisfied and 10 the highest possible level of satisfaction (UNDP, 2014).

Apart from economic equality, another aspect where Finland excels compared to Canada is in gender equality. The gender inequality index (GII) is a composite measure that includes measures of reproductive health (maternal mortality ratio and adolescent birth rate), empowerment (parliamentary seats, share of population with at least a secondary education) and participation in the labor force. The values of the GII range from 0 to 1. A value of 0 indicates gender equality and a value of 1 indicates that women fare poorly compared to men in these dimensions (UNDP, 2011). Finland has a much smaller GII (0.075) compared to Canada (0.136) (UNDP, 2014). These figures demonstrate that there is more gender equality in Finland than Canada. In fact, the UNDP (2014) shows that in world rankings Finland is the 11th most equal country in the world, and Canada is the 23rd most equal. Finland and Canada rank fairly similarly in reproductive health and labor force participation (UNDP, 2014). However, Finland surpasses Canada on measures of female empowerment. One aspect in which this is evident is in parliamentary representation. In Finland, 42.5% of seats in parliament are held by woman, compared to only 23% in Canada (UNDP, 2014). This difference can be attributed to the fact that many Scandinavian countries, including Finland, have adopted a proportional representation electoral system which gives women better opportunities to be elected (Matland, 1998).

Thus, although Canada and Finland both rank high on the Human Development Index, there are differences in equality between the two countries. These differences are relevant to this research because research suggests that income and gender inequalities within developed countries have detrimental effects on health outcomes (Phillips, 2005; Raphael, 2001; Wilkinson,
1997), such that the more unequal a country is the higher the health disparities between the rich and the poor. I expect to see differences between Canada and Finland in terms of how social class and gender affect depressive symptomology in both countries.

The following section will explore other differences between Canada and Finland in terms of the demographic variables used in this study.

1.2.2 Children’s Living Arrangements

Changes in children’s living arrangements in Canada and Finland have followed similar trends as most countries in the OECD (Forssen & Laukkanen & Ritakallio, 2002). In Canada, the most common living arrangement for children is children living with both biological parents with 73% of children living in this arrangement in 2002, followed by 14% of children living in lone-parent families, 11% living with step-families, and finally 2% living in other arrangements (Boyce, 2004). Trends have been observed where married families with children have been decreasing throughout the years. This can be attributed to the fact that since the late 1960s to early 1970s divorce rates have increased dramatically, and cohabitation rates have increased (Statistics Canada, 2006). The type of family living arrangement that is seen to be growing is common law families with children. Common law families have increased 14% since 2006, and this type of family arrangement is now more common than single parent families (Statistics Canada, 2006). With regards to single parent living arrangements in Canada the most common type are lone mother families; about 80% of lone parent families are mother lone parent families (Statistics Canada, 2006). However, there has been an increase in lone parent families headed by fathers. In the 5 years prior to 2006, lone parent families headed by fathers increased by 15% (Statistics Canada, 2006). Overall, there has been an increase in lone parent families since the
1970s, but rates for this type of living arrangement for children have been stabilizing since 2006 (Statistics Canada, 2011).

Divorce rates have also been increasing since the 1970s in Finland. Similar to Canada, 72.4% of children live with both biological parents, followed by 17.5% living in lone-parent arrangements and 10.1% living in stepfamily arrangements (Griesbach, Amos, & Currie, 2003). A child living with both biological parents is the only type of family arrangement in Finland where the numbers are falling continuously (Forssen, Laukkanen & Ritakallio, 2002). It has been suggested that this is attributed to rising divorce rates, improved housing conditions for young individuals, the rise of cohabitation, and declining fertility among married couples (Statistics Finland, 2009). Like in Canada, Finland has also seen an increase in cohabiting couples/common law couples. In 2009, cohabiting couples with children accounted for 8% of families in Finland (Statistics Finland, 2009). Since 1990 the proportion of single parent living arrangements for children has increased year after year. In 2006 this accounted for about 16% of families (OECD, 2014). The most common type of single parent living arrangements are lone-mother families (Forssen, Laukkanen & Ritakallio, 2002). Finally, the percentage of children living in step-families was about 13% in 2006 (OECD, 2014).

In summary the trends in children’s living arrangements between Canada and Finland are very similar. In both countries there is an increase in children living in non-intact families (Statistics Canada, 2006; Statistics Finland, 2009). This is important given research findings indicating that there are effects of family arrangements on depressive outcomes among adolescents where adolescents living in family arrangements other than living with both biological parents report higher depressive symptomology (Gore, Aseltine & Colten, 1992; Greenberger, Chen, Tally & Dong, 2000; Kaltiala-Heino, Rimpela, Marttunen, Rimpela &
Rantanen, 1999; Samm et al., 2010; Torikka, Kaltiala-Heino, Rimpela, Rimpela & Rantanen, 2001). Adolescents’ living arrangements will be included in my research in order to specifically evaluate how family arrangements affect depressive symptomology among adolescents in both countries.

The following section will compare aspects of education and academic achievement outcomes in each country. It is essential to have this background information, as aspects of the education system can influence not only the independent variables in my model, but also the relationship between school work pressure and depression (Keyes, 2006; DeSocio & Hootman, 2004; Larson & Verman, 1999; Lin & Chen, 1995; Phelan et al., 1994; Matheny et al., 1993).

1.2.3 Education

Education statistics presented by the UNDP (2013), report that the percentage of gross enrollment ratio for primary and secondary education is similar for both Canada and Finland. Almost 100% of children in Canada and Finland are currently enrolled in primary or secondary education (UNDP, 2013). A difference is observed at the level of tertiary education. Tertiary education is defined as education after high school, which can include universities, colleges, technical training institutes, etc. (UNDP, 2014). Based on the UNDP data (2013), the gross enrollment ratio for tertiary education is 91.6% in Finland and 60% in Canada. The fact that there is such a high enrollment rate in tertiary education in Finland could be due to the fact that in comparison to Canada, tuition fees are negligible. Canada has the 5th highest tuition fees among public tertiary institutions out of 23 OECD countries. Annual tuition fees are on average CAN$4214 in Canada. This results in high financial barriers to entry into tertiary education (OECD, 2011). This is opposed to Finland where there are no tuition fees for students. Finland is
one of eight OECD countries where institutions do not charge fees. Countries such as Finland have social values rooted in equality and opportunity and a culture that places high importance on education (OECD, 2011). These countries also provide assistance to tertiary students for living expenses through grants and low-interest rate loans (Biffl & Issac, 2002). However, a caveat to these statistics is that it does not represent completion of schooling but rather it is just the total enrollment as a percentage of the official school-aged population for the same level at a certain time (UNDP, 2013).

For this project, it is also imperative to compare aspects of the education systems in Canada and Finland; more specifically what each system does to increase academic achievement among the student populations. Institutional factors in each country will influence how students experience schoolwork pressures. There are three major aspects that differentiate the policy principles to increase student achievement in the education system in Finland compared to other systems such as the ones in the United States or Canada. First, the methods used to evaluate schools, teachers and students in Finland are based on flexibility and diversity. Institutions are encouraged to build on existing good practices and teachers and students are encouraged to try new ideas and methods in teaching and learning (Kupiainen, Hautamaki & Karjalainen, 2009; Sahlberg, 2007). The opposite is seen in Canada, where reform is based on standardized performance metrics. In Canada, clear guidelines and standards are set which schools, teacher and students are required to meet in order to determine and improve on outcomes (Kupiainen et al., 2009; Sahlberg, 2007). Second, in Canada the emphasis of reform is based on literacy and numeracy. This means that there is a focus on reading, writing, mathematics and science outcomes. In Finland, there is an emphasis on broad learning combined with creativity (Kupiainen et al., 2009; Sahlberg, 2007). Finally, the Finnish school system is based on trust in
its teaching professionals. It is a system that acknowledges the value of the judgement of principals and teachers in determining what is best for students. This is opposed to the Canadian model, where raising school achievement is evaluated through inspection (Kupiainen et al., 2009; Sahlberg, 2007).

Another important aspect of education for this project is academic performance at the national level. The OECD performs standardized tests called the Programme for International Student Assessment (PISA) in three areas of academics: science, mathematics, and reading. Questions in the PISA assessments are not directly linked to school curriculum but rather attempt to evaluate students’ application of knowledge to real life situations in each of the three areas (OECD, n.d.). Since 2000, Finland has sparked international interest due to the fact that 15 year-olds score exceptionally high in all three domains compared to the rest of the world (Laukkanen, 2007). Since the year 2000, Finnish adolescents have consistently scored among the top three countries in all of these domains (Laukkanen, 2007). Additionally, students in Finland report some of the lowest variances around the mean compared to other countries, demonstrating that there are relatively smaller differences between schools across the country (Kupiainen et al., 2009).

Many researchers have theorized about the success of Finnish students on these assessments. Some attribute Finland’s success in the PISA to the excellent teaching and the high quality of teacher education in Finland (Kupiainen et al., 2009; Salhberg, 2007). Others attribute the success of students to the educational policies, which are based on equity, flexibility, creativity, teacher professionalism and trust (Sahlberg, 2007). Others have focused more on historical and societal reasons for Finland’s educational success. Simola (2005) states that historically Finnish society had, and still has in many regards, an authoritarian, obedient and collectivist mentality.
This mentality is partly a result of the fact of Finland’s geographical location, being a border country between the industrial west and collectivist east. This mentality has allowed for students to be obedient and trusting towards authoritarian figures such as teachers. Finally, another structural difference that Simola (2005) claims contributes to the success of Finland in the PISA (and is also a difference between Canada and Finland) is the high status of teachers in Finland. Teachers in Finland identify themselves as being part of the upper social strata in Finland (Sahlberg, 2010; Sahlberg, 2007; Simola, 2005). The general public in both lower and higher social strata have high respect, trust and satisfaction in the work of teachers in Finland (Sahlberg, 2010; Sahlberg, 2007; Simola, 2005). Teachers also garner support from the political and economic elite in Finland (Sahlberg, 2007). Thus, there is a culture where teachers are satisfied and committed to their work, and the general population see them as effective authority figures (Simola, 2005).

Canada also places well in the PISA assessments, and students in Canada score well above the international average in all three areas (Knighton, Brochu & Gluszynski, 2010). However, there is significant variation in mean scores between provinces in Canada. Students in Alberta, Quebec and Ontario score above or at the Canadian mean in all three areas, while students in the Atlantic Provinces, such as New Foundland, New Brunswick, Nova Scotia and PEI score below the Canadian mean in all three areas (Knighton et al., 2010). In recent years, the gap in mean score between Finland and Canada has decreased (UNDP, 2014).

In the study of macro-indicators of education it is evident that the culture of importance of education is more salient in the Finnish context. More funding, support and opportunities are given to adolescents to get into tertiary school (OECD, 2011), and teachers are given more freedom to teach and are trusted and respected more (Jauhianene, Kivirauma & Rinne, 1998;
Kupianen et al., 2009, Simola, 2005). Students are also given more freedoms and are more involved in the creative process of their education (Kupiainen et al., 2009), and finally adolescents in Finland reach higher standards of achievements in international standardized assessments compared to other OECD countries (Kupiainen et al., 2009; Laukkanen, 2007). Educational achievement on a national scale is relevant for this project because I look at how school related stressors affect depressive symptomology. Getting into tertiary schools, having no freedom or voice in classrooms and achievement pressures are all factors that adolescents identify as stressors associated with the school environment (Burnett & Fanshawe, 1996; deAnda et al., 2000; deAnda et al., 1997). In providing a context of certain educational aspects, I look to explore whether differences in the culture of education in both countries are related to differences that may or may not be found in my study in terms of how school work pressure affects depressive symptomology.
Chapter 2: Literature Review: Depression & Substance Usage.

2.1 Depression Literature

The first part of this research project focuses on the causes of depressive symptomology from a sociological perspective. As outlined in the theoretical section of the literature review (section 1.1 above), using the stress process model I will look at the effect of my focal stressor, school work pressure, on the outcome of depressive symptomology. I will also evaluate how socio-demographic variables affect depressive symptomology, and how these variables affect the relationship between the stressor and the outcome. In order to provide a background on the depression literature, I will first provide a brief review of the sociological literature on mental health in general. Secondly, I will review the literature focusing on the prevalence of depression among adolescents, both in a clinical and a symptomological sense. I will review the literature on the effects of schoolwork pressure on adolescent mental health, and finally I will summarize the literature that demonstrates how socio-demographic variables are associated with depressive symptomology among adolescents. These variables include sex, age, family living arrangement and socio-economic status (SES).

There are two main methods to measure depression as a mental health outcome. Researchers either study depressive symptomology through the use of inventory scales such as Center for Epidemiologic Studies Depression scale, or they study clinical diagnoses of major depressive disorder (Turner, Wheaton & Lloyd, 1995). While psychologists tend to favour clinical data, most sociologists study depression using symptom scales. Scales enable social researchers to rank people according to the intensity of their depressive symptomology as opposed to measuring depression for the purposes of treatment (Pearlin et al., 1981; Pearlin,
1989). All the literature regarding the correlates of depression that I summarize in this literature review measures depression through depressive symptomology unless otherwise stated.

Although adult mental health has been studied extensively for many years now (Allgood-Merton, Lewinsohn & Hops, 1990), child mental health is a more recent field of study. As recently as the 1970s, many still believed that depression did not occur among children (Fergusson & Woodward, 2002). Mental health illness is highly stigmatized, and children who suffer from mental health issues often face prejudice and discrimination (Corrigan, Lurie, Goldman, Slopen, Medasani & Phelan, 2005). However, clinically speaking, more recent research indicates that children and adolescents do indeed experience many mental health issues. It has been suggested that 2-8% of young people experience their first episode of major depression by age 16 (Fergusson & Woodward, 2002), and that approximately 12-22% of children suffer from diagnosable mental, emotional, or behavioral disorders or outcomes (Fergusson & Woodward, 2002). Of these, relatively few receive mental health services (Adelman & Taylor, 1998). Therefore, research is necessary in order to develop a better etiological understanding of mental health outcomes in adolescents. It is imperative to understand how the social aspects of children’s lives may contribute to mental health issues in order to better detect, prevent, treat and educate others about these issues. These estimated rates are also significant because other studies also show that depression among adolescents may serve as a precursor to suicidal ideation (Ang & Huan, 2006).

2.1.1 Prevalence of Depressive Symptoms

Studies of clinical depression show that the age of onset of clinical depression in the population has rapidly decreased (Avenevoli et al., 2008), and there is evidence to suggest that
depressive symptomology occurs with considerable frequency in childhood and adolescence (Ustun et al., 2004). There are varying estimates of the prevalence of clinical major depression among children and adolescents (Avenevoli et al., 2008), but studies have shown that the prevalence of depression measured through the DSM-IV among school children ages 7-12 years of age is lower than adolescents between the ages of 13-18. Based on a meta-analysis on international studies in United States, Canada, Europe and Asia, the reported rates of those experiencing some form of clinical depression for each of these groups ranges from 1-3% for 7-12 year olds and 1-7% for 13-18 year olds (Avenevoli et al., 2008).

Shifting to an examination of the symptoms of depression, Lewinsohn, Hops, Roberts, Seeley & Andrews (1993) state that by the age of 14, as many as 9% of adolescents have experienced at least one episode of severe depressive symptomology. Another study by Hamman & Rudolph (2004) reports that the lifetime prevalence rates of depressive symptoms for adolescents 15-18 years of age is approximately 14%, with 11% reporting minor depression (clinical). Reports by the WHO state that depression broadly defined to include depression symptoms and mixed anxiety affects about 5-10% of adolescents in the world (World Federation for Mental Health, 2012). A study using the National Population Health Survey by Statistics Canada found that for adolescents aged 12-19 years of age the prevalence rate for depressive symptomology for boys was 4.8% and for girls 8.7% (Cairney, 1998). In an epidemiological study done on representative nationwide sample of Finnish adolescents, Haarasila, Marttunen, Kaprio & Aro (2001) found that about 5.2% of adolescents reported a 12 month prevalence of major depressive symptoms. This percentage was higher for girls than for boys. This shows that while there are varying degrees of prevalence around the world, depressive symptomology is more prevalent than clinical depression. Also, the rates of adolescents who report depressive
Symptomology between Canada and Finland are approximately the same. These rates are concerning because longitudinal studies in high income nations have also shown that if depressive symptomology is left unattended in childhood, it can have longstanding social and economic implications in adulthood. These longstanding effects can include, but are not limited to, lower levels of educational attainment, increased criminal involvement, higher levels of unemployment and difficulties with personal relationships (World Federation for Mental Health, 2012). Therefore, it is imperative that we understand the social factors that affect depression and depressive symptomology among children and adolescents, so that we can prevent problems later in life.

The following sections will investigate the correlates of depressive symptoms among adolescents. First, I will review the literature on school work pressure as a stressor that leads to depressive symptomology. Second, I will explore how depressive symptomology is patterned by socio-demographic indicators.

2.1.2 School Work Pressure and Depressive Symptoms

It is well established that children and adolescents go through many different types of school-related pressures and stresses. These can include stress produced by teaching methods, school work load, school environment, anxiety about the future, and expectations from adults (Burnett et al., 1996; de Anda et al., 2000; de Anda et al., 1997; Matheny et al., 1993; Murberg & Bru, 2004; Verma, Sharma & Larson, 2002). My research focuses on stress caused by school work load. Therefore, the following literature review will address school-related stress or pressures based on work load. At times, the literature will indicate specific aspects of school work pressure such as exams, homework, or class work (Davis et al., 2002; Karvonen &
Rimpela, 2005; Verma, Sharma & Larson, 2002), and at other times school work pressure is measured more generally (Karademas, Peppa, Fotiou & Kokkevi, 2008). This section of the literature review will look at the relationships that have been discovered between school work pressure and depressive symptomology.

Since the study of mental health in children and adolescents is a fairly recent phenomenon, some research connecting school pressures and mental health is exploratory. (Keyes, 2006; DeSocio & Hootman, 2004; Larson & Verman, 1999; Lin & Chen, 1995; Phelan et al., 1994; Matheny et al., 1993). Most of these studies find that school pressures have a lot to do with emotional, psychological and even physical well-being, where it seems that there is a negative relationship between school pressures and well-being. However, due to the exploratory nature of many of these studies, direct associations are not always specifically assessed. One study on secondary school students in Hong Kong studied the effects of positive school environments on mental health outcomes such as anxiety, social dysfunction and depressive symptomology (Davis et al., 2002). This measure of positive school environment included aspects of examination pressure and school work pressures. When looking at depressive symptomology they observed a significant negative correlation between positive school environment (lower examination pressures and lower school work pressures) and depression measured through depressive symptoms. Although the specific measured effects were not specifically teased out, a positive school environment with regards to school work pressure corresponded to less examination and school work pressure and thus can give us some indication that less examination and school pressure is associated with less depressive symptomology (Davis et al., 2002).
Methodologically speaking, other research done in the area of school work pressures and depressive symptomology is quantitative research. The surveys/questionnaires in these studies allow for correlational analyses to be conducted in order to explore the relationships between variables. These studies have been conducted in different nations and correlations between the two variables exist such that school work stress results in increased depressive symptomology in several settings (Ang & Huan, 2006; Anderman, 2002; Davis et al., 2002; Karvonen & Rimpela, 2005; Lee & Larson, 2000; Low et al., 2012). For example, in a cross national study of Korean adolescents and American adolescents it was found that as school work pressure increased (demands of actual workload and studying for exams) due to preparation for college entrance exams, there was an increase in depressive symptomology. Depression in this study was measured using the Children’s Depression Inventory to assess symptoms of clinical depression. These results were stronger for Korean adolescents than American adolescents. The authors conclude that, in general, Korean adolescents attributed more negative feelings to school work and spent more time on school work than American adolescents (Lee & Larson, 2000). These findings show that there is a clear relationship between the two variables but also that the relationship is contextual.

Similarly, a study using the 2006 HBSC data from Greek school-aged participants also found that school work pressure (measured by how much pressure participants felt from school work) was positively related to the same health complaints that I use in this project to measure “depressive symptomology”. They found that as schoolwork pressure increased, health complaints increased in all age groups studied: 11, 13 and 15 year olds (Karademas et al., 2008). Finally, Verma, Sharma & Larson (2002) found that demands of class work and homework are both positively related to more psychological distress, operationalized through measures of
depressive symptomology. These effects change, however, with the amount of time spent on each aspect of school work. Adolescents who spent less time on school work and more time on leisure reported less psychological distress, regardless of their reports of school work demands. In contrast, those adolescents who reported spending less time on school work reported experiencing more academic anxiety because they were not spending time on school work. This study exemplifies the importance of the role of a student in adolescents’ lives and how they face trade-offs in meeting the demands of school work and other forms of time use.

This next section will summarize studies conducted in Canada and Finland specifically. A study done on a representative sample of 14 and 15 year olds in Finland used health complaints as their dependent variable. The health complaint measure they used is commonly connected with depressive symptomology. These measures include headaches, being strained or nervous, being irritated or angry, difficulties sleeping, being tired, weak and feeling weak, and pain in the abdomen, neck and back (Karvonen & Rimpela, 2005). They found that increasing schoolwork demands on adolescents resulted in increasing health complaints, controlling for other school-related factors such as poor class spirit, relationships with teachers and bullying. However, they also found that high health complaints were also affected by low school work demands. They found that this was the case because of frustration that could result when students were given too little work or the work was too easy or trivial. They also found that this relationship was moderated by classroom support climate, demonstrating the importance of school culture (Karvonen & Rimpela, 2005). Low et al. (2012) also found that there was a significant effect of schoolwork stress on depressive symptomology among adolescents. They found that in a representative sample of 7th grade Quebec students, adolescents who reported
having schoolwork stress were about three times more likely to report having depressive symptoms than those adolescents that reported having no stress due to schoolwork.

Some qualitative studies have also been conducted in order to better explain these relationships through the lived experiences of the adolescents affected. Qualitative studies conducted realize that to truly understand what adolescents go through in their school and educational lives it is essential to get them to explain it (Lin & Chen, 1995; Phelan et al, 1994). After interviewing 54 economically and ethnically diverse high school students in California, Phelen et al. (1994) reported that 90% of their participants reported tremendous pressure to achieve academically which resulted in students expressing feelings of depressive symptomology. Another study done by Lin & Chen (1995) on Chinese students in China provides insight to the voices of students experiencing school stress and how these stressors affect their lives. For example, a quote by one of their participants illustrates the effect of schoolwork pressure on mental health:

It [academic pressure] is just like a devil, hanging around me all day long and depriving me of the beautiful life. The sky changed from blue into gray and there is no sign of life left in the surroundings… Every day, the six subjects are like six huge mountains on top of me. Only the ten minutes or so on the way back home is the time I can have a rest. But even then my mind is blank and numb… (p.156-157).

Qualitative methods and studies such as these add another dimension to this research in such a way that it can provide insight to how adolescents truly experience their lives. In this quote for example we can start to understand in a much more descriptive way how academic pressure on this individual has had negative effects on the life he/she lives.
This review of the literature demonstrates a clear relationship between school work pressures and psychological distress and depressive symptomology. Using the theoretical background of the stress process in connection with the literature, it is apparent that increasing demands of school work results in an increase in depressive symptomology (Ang & Huan, 2006; Anderman, 2002; Davis et al., 2002; Karvonen & Rimpela, 2005; Lee & Larson, 2000; Low et al., 2012). A study done by Matheny et al. (1993), states that academic stress can be referred to as an “invisible disability,” because it leads to worry and feelings of being overwhelmed among adolescents. This thesis will provide another dimension to this research by comparing the effects of school work pressure on depressive symptomology between Canada and Finland, and observing whether the strength of these relationships are different in each context.

The sections that follow (sections 2.1.3 through 2.1.6) will review the literature on how socio-demographic indicators affect depressive symptomology among adolescents. Following the stress process framework, I examine the relationship between sex and depressive symptoms (section 2.1.3), age and depressive symptoms (section 2.1.4), adolescents’ living arrangements and depressive symptoms (section 2.1.5) and SES and depressive symptoms (section 2.1.6). This thesis recognizes that pubertal status is an important physical indicator that is also correlated to depression and depressive symptomology in adolescents. Research suggests that puberty is particularly stressful for girls and can result in higher depressive symptomology (MacPhee & Andrews, 2006; Marcotte, Fortin, Potvin & Papillon, 2002; Rudolph & Flynn, 2007; Twenge & Nolen-Hoeksema, 2002). However, measures of puberty were not available in the HBSC data, thus it will not be included as a predictor in this project.
2.1.3 Sex and Depressive Symptoms

Sociologists have shown that several social factors affect mental health outcomes such as depressive symptomology. With regards to sex and age, much research suggests that before puberty there is no difference between levels of psychological distress or reported depressive symptomology among boys and girls (Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994; Twenge & Nolen-Hoeksema, 2002). However, this trend changes during adolescence, and by the ages of 13-14 girls are reported to experience more distress and depressive symptomology than boys (Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994; Twenge & Nolen-Hoeksema, 2002). In research done on adolescents, most research shows that girls report higher levels of depressive symptomology than boys (Avinson & McAlpine, 1992; Bodur & Kuchukkendirci, 2010; Coelho, Martins & Barros, 2002; McGuinness, Dyer & Wade, 2012; Poulin, Hand, Bourdreau & Santor, 2005; Schraedley, Gotlib & Hayward, 1999). There are several theories to explain these gender differences. Some argue that girls have less psychosocial resources than boys, such as mastery and self-esteem (Avinson & McAlpine, 1992). Others argue that differences in parent-child relationships, particularly the mother-daughter relationship, affect girls negatively (Avinson & McAlpine, 1992). Still others suggest that stress and social support is more salient among girls than boys (Schraedley, Gotlib & Hayward, 1999), and that intensified interpersonal relationships among girls lead girls to become extremely concerned about social evaluation (McGuinness, Dyer & Wade, 2012). Several of these factors, which emerge at puberty are more present and pressing among girls than boys and may leave them vulnerable to depressive symptomology (Hankin & Abramson, 2001).

One study conducted in Finland on adolescents found that in a nationwide representative sample of adolescents aged 15-19 years of age, females were 38% more likely compared to
males to have major depressive episodes (Haarasilia et al., 2004). Likewise, in Canada, in a study done using the National Health Population Survey found that there were significant sex differences in the level of depressive symptoms and prevalence of major depressive episodes among adolescents aged 12-19 years old. They found that in both cases girls are more affected than boys (Galambos, Leadbeater & Barker, 2004). Similarly, in a study done in the Atlantic Provinces with adolescents with an average age of 15.2 years, girls were found to have a threefold higher prevalence of elevated depressive symptoms and a twofold higher prevalence of somewhat elevated depressive symptoms compared to boys (Poulin et al., 2005). All of this literature indicates that sex plays a salient role in predicting depressive symptomology, especially in adolescence, and is something that is expected in my research.

2.1.4 Age and Depressive Symptoms

The literature consistently suggests that an increase in age during childhood and adolescence results in an increase in depressive symptomology. This trend is more prominent after puberty (Bodur & Kucukkendirci, 2010; Hankin, 2006; Kubik, Lytle, Birnbaum, Murray & Perry, 2003; Poulin et al., 2005; Rushton, Forcier & Schectman, 2002; Schraedley, Gotlib & Hayward, 1999; Siegel & Griffin, 1984). For example, Poulin et al., (2005) found that in the Atlantic provinces of Canada, adolescents were 12 percent more likely to report elevated depressive symptoms if they were in grade 12 compared to grade 7. Similarly, in the USA, Schraedley, Gotlib & Hayward (1999) found that the means of frequency of depressive symptoms were different between preteens, early teens and late teens. They found that the means were highest amongst adolescents classified in the late-teens category. These results are consistent in areas in Europe as well (Bodur & Kucukkendirci, 2010). Theories regarding why this relationship is apparent are linked to the fact that adolescents go through many more
stressful situations as they age (Wight, SepUlveda & Aneshensel, 2004). Additionally, once a child reaches the point of puberty in their development they are faced with vulnerability factors that may affect the way they cope with the increasing stressors of aging (Twenge & Nolen-Hoeksema, 2002; Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994). It is evident through this review that age is significantly correlated to depressive symptomology, where most of the literature suggests that as youth age (especially after puberty) there is a higher likelihood of depressive symptomology.

2.1.5 Living Arrangements and Depressive Symptoms

When looked at independently, the living arrangement of adolescents also have a significant effect on mental health outcomes (Gore, Aseltine & Colten, 1992; Greenberger et al., 2000; Kaltiala-Heino et al., 1999; Samm et al., 2010; Torikka et al., 2001). Research has shown that adolescents who live in family arrangements other than living with two biological parents are at risk of developing depressive problems. Some research does state, however, that the relationship between these two variables goes to non-significance once SES is accounted for (Barrett & Turner, 2005; Gore, Aseltine & Colten, 1992). Similarly, research shows that once the relationships between family members and adolescents are accounted for, the effect of living arrangements becomes non-significant. The effects of the family arrangement variable on depressive symptomology is not significant when adolescents report positive relationships with family members present with them (Carlson, 2006; McFarlane, Bellissimo & Norman, 1995; Mckeown, 1997; Rushton, Forcier & Schectman, 2002; Samm et al., 2010).

A study done by Barrett & Turner (2005) in the United States found that adolescents from single parent households had significantly higher levels of depressive symptomology
compared to those living in households with a mother and a father. However, once the variables of SES, family support and family negativity were added to the model, the relationship between living arrangements and depressive symptomology became insignificant. Samm et al. (2010) also found that what is more important is the connectedness European adolescents feel with parents. They found that, controlling for family arrangement, adolescents who reported that it was easy to communicate with their mother and/or father were at decreased odds of reporting suicidal ideation and/or depressiveness compared to adolescents that reported that communication between their mothers and/or fathers was difficult. Similarly, another study on American adolescents found that family arrangement was not a significant predictor of depressive symptoms. Rather, what were significant predictors of depressive symptoms of adolescents were perceptions of emotional bonding in the family and cohesion (Mckeown et al., 1997).

There is some research that concludes that even controlling for SES there are still effects of family arrangement on depressive symptomology (Gore, Aseltine & Colten, 1992; Kaltiala-Heino et al., 1999; Torikka et al., 2001). Torikka et al. (2001) conducted a study on a representative sample of 14-16 year olds in Finland and found that the living arrangement category that had an effect on depressive symptomology was living in a stepfamily. The odds of developing depressive symptoms when living with stepfamilies increased by 30% compared to living with both biological parents controlling for parental education. However, this finding was only significant for girls in this age category and not boys. Another study conducted on 14-16 years olds in two specific regions in Finland that also controlled for SES found that living with lone parents increased the odds of having depressive symptomology compared to adolescents who lived with two biological parents (Kaltiala-Heino et al., 1999). Some studies conducted in America also show that being in a non-intact family is still weakly related to higher
symptomology accounting for other family variables (Gore, Aseltine & Colten, 1992). Although some research shows that family arrangement affects depressive symptomology or mental health outcomes, most of the research suggests that both relationships between guardians and adolescents and the socioeconomic status of families are more important than family arrangement alone, and this is expected in my research as well.

2.1.6 Socioeconomic Status and Depressive Symptoms

Most research shows that belonging to a lower economic status increases the likelihood of depressive symptomology among adolescents (Barret & Turner, 2005; Bradley & Corwyn, 2002; Gore, Aseltine & Colten, 1992; Kubik et al., 2003; Rushton, Forcier & Schectman, 2002; Saab & Klinger, 2010; Saaman, 2000; Siegel & Griffin, 1984; Torikka et al., 2014; Wight, SepUlveda & Aneschensel, 2004). These studies suggest that adolescents in these situations have lower adaptive functioning due to the lack of resources that they may have as compared to more affluent populations, therefore resulting in higher depressive outcomes (Bradley & Corwyn, 2002). Ravens-Sieberer, Kokonyei & Thomas (2009) report similar findings in their study on 41 European countries, including Finland. Their study was based on the same survey that is being used in this project, the 2005/2006 HBSC. Using the same measure of ‘depressive symptomology’ used in this project, they found that the odds of reporting higher psychological complaints increased when adolescents belonged to a lower family affluence category compared to those who belonged to a high family affluence category. In a meta-analysis, Letourneau et al. (2011) found that most of the studies they reviewed found a negative relationship between socioeconomic status and depressive symptomology among adolescents.
Research suggests that the effect of SES on depressive symptomology may be mediated by other variables such as family support, sex or community safety (Rushton, Forcier & Schectman, 2002, Twenge & Nolen-Hoeksema, 2002). Some researchers such as Twenge & Nolen-Hoeksema (2002) argue that there are really no socioeconomic effects on mental health outcomes such as depressive symptomology. They argue that other factors (such as sex) are more prominent in determining such outcomes. In an American study, Kubik et al. (2003) found that the relationship between SES and depressive symptomology was stronger for girls than boys. They found that girls that were in a low SES status were 90% more likely to have reported elevated depressive symptoms compared to girls in high SES statuses. For low SES boys, this effect was 77%. Although there is a definite effect of SES status on depressive symptoms, it is apparent that the strength of this effect may depend on the sex of the individual. These findings highlight the importance of not just looking at the effects of SES on depressive symptomology, but at other indicators as well.

The fact that most research shows a negative effect of SES on depressive symptomology does not mean that affluent children do not experience mental health outcomes such as depressive symptomology. Luthar & Becker (2002) engaged in an exploratory and descriptive study on affluent adolescents in suburban America and discovered that adolescents in these situations experience different pressures that may result in increased rates of internalizing and externalizing mental health outcomes. The pressure to succeed and to get into stellar colleges, parental pressure, and perfectionist sentiments of adolescents are all factors that result in these outcomes. The relationship between socioeconomic status and mental health outcomes is intricate because in each situation there are varying degrees of resources available, pressures, and mentalities and goals for individuals in different economic strata (Luthar & Becker, 2002). This
research by Luthar & Becker (2002) highlights stressors that high SES adolescents may go through and that may very well have an effect on depressive symptomology. However, most research does concur that being in low strata is a risk factor for depressive symptomology (Barret & Turner, 2005; Bradley & Corwyn, 2002; Gore, Aseltine & Colten, 1992; Kubik et al., 2003; Rushton, Forcier & Schectman, 2002; Saab & Klinger, 2010; Saaman, 2000; Siegel & Griffin, 1984; Torikka et al., 2014; Wight, SepUlveda & Aneschensel, 2004).

Based on this literature review on the effects of socio-demographic variables on depressive symptomology it is apparent that there are clear relationships between socio-demographic indicators and depressive symptomology. Most literature suggests that females report higher prevalence or higher levels of depressive symptomology than males (Avinson & McAlpine, 1992; Bodur & Kuchukkendirci, 2010; Coelho, Martins & Barros, 2002; McGuinness, Dyer & Wade, 2012; Poulin et al., 2005; Schraedley, Gotlib & Hayward, 1999) and that as adolescents get older there is an increase in prevalence and level of depressive symptomology (Bodur & Kucukkendirci, 2010; Hankin, 2006; Kubik et al., 2003; Poulin et al., 2005; Rushton, Forcier & Schectman, 2002; Schraedley, Gotlib & Hayward, 1999; Siegel & Griffin, 1984). Adolescents that are in living arrangements other than with both biological parents are at risk of having more depressive symptomology (Gore, Aseltine & Colten, 1992; Greenberger et al., 2000; Kaltiala-Heino et al., 1999; Samm et al., 2010; Torikka et al., 2001). However, there is a protective effect of positive family relationships on depressive symptomology that may be more important than the effect of family structure (Carlson, 2006; McFarlane et al., 1995; Mckeown et al., 1997; Rushton, Forcier & Schectman, 2002; Samm et al., 2010). Also, literature that explores the effect of SES and depressive symptoms shows that in general a negative relationship is found such that adolescents who are of lower SES levels are
seen to report more depressive symptomology (Barret & Turner, 2005; Bradley & Corwyn, 2002; Gore, Aseltine & Colten, 1992; Kubik et al., 2003; Rushton, Forcier & Schectman, 2002; Saab & Klinger, 2010; Saaman, 2000; Siegel & Griffin, 1984; Torikka et al., 2014; Wight, SepUlveda & Aneschensel, 2004). Reflecting the stress process model, it is apparent that depressive symptomology as a stress outcome is stratified by socio-demographics variables (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981). My research will further examine whether these effects differ in two different national contexts.

As mentioned in section 1.1.3 this research project also expands on the stress process model by exploring how the stress outcome of depressive symptomology affects a behavioural outcome - substance usage among adolescents. In particular, I will look at smoking and alcohol consumption. There is research that indicates that internalized depressive symptoms can lead to externalized health risk behaviours among adolescents (Boys et al., 2003; Dierker et al., 2002; Goodman & Capitman, 2000; King et al., 2004; Kwon, 2013; Mayfield Arnold et al., 2014; Nation & Heflinger, 2006; Patton et al., 1996; Pederson et al., 1997; Tyas & Pederson, 1998). My research will explore whether health risk behaviours such as smoking and alcohol consumption are also affected by the stressor of school work pressure, and whether these behaviours are structured by socio-demographic indicators. The following sections will explore the literature on adolescent smoking behaviour and adolescent alcohol consumption.

2.2 Smoking Literature

There is evidence to suggest that depressive symptomology as a stress outcome affects smoking behaviors among adolescents (Boys et al., 2003; Dierker et al., 2002; Goodman &
Capitman, 2000; Mayfield Arnold et al., 2014; Patton et al., 1996; Pederson et al., 1997; Tyas & Pederson, 1998). The following sections will provide information on the prevalence of smoking among adolescents in both Canada and Finland. There will be a discussion of the literature on the relationships between the focal variables of school work pressure and depressive symptomology on smoking behaviours, and a section exploring the relationship between socio-demographic variables and smoking behaviours among adolescents. I will also explore the literature on the effects of sex, age, family living arrangement and socioeconomic status on smoking behaviours among adolescents.

2.2.1 Smoking Prevalence

Research indicates that smoking patterns are usually established during adolescence, and that a large number of adolescents smoke (Eaton et al., 2010; Hammond, Doxey, Daniel & Bansal-Travers, 2011; Leatherdale & Ahmed, 2010; Leatherdale & Burkhalter, 2012; Leatherdale, Hammond & Ahmed, 2008; Raisamo, Doku, Rimpela, 2011). Hammond et al. (2011) found using the Canadian Youth Smoking Survey (2009) that approximately 26% of Canadian adolescents between grades 7-12 reported previous tobacco usage. Using the Canadian Addiction Survey, it was found that in 2005 the rate of 15 year old or older current smokers was 19% (Leatherdale et al., 2008). Similar results have been observed in Finland. However, the rates of smoking among Finnish adolescents have been decreasing since the 1980s. In a study using the Finland Adolescent Health & Lifestyle Survey, Raisamo et al., (2011) found that rates of 16 year olds who had tried smoking decreased from 1983 to 2011. They found that in 1983 the percentage of males who had tried smoking was 81% and females 78%. This decreased in 2011 to 51% and 57% respectively (Raisamo et al., 2011). Similarly, the percentages have also decreased between the same time periods for 16 year old daily smokers. In 1983 the percentage
of males who said they were daily smokers was 27% and 23% for females. This decreased in 2011 to 19% for both sexes (Raisamo et al., 2011). In fact the decrease in smoking is not just a trend that is observed in Finland but in most of the developed world. The Health Behaviour in School Aged Children survey is a global initiative that aims to increase our understanding of adolescent health (HBSC, 2015). Research using the HBSC has found that on average between the years of 1997 and 2006, there has been a decrease in prevalence of daily smokers in 26 countries. These results were found for both boys and girls at ages 13 and 15 in both Canada and Finland (Currie et al., 2000; Currie, Molcho, Boyce, Holstein, Torsheim & Richter, 2008). The decrease in smoking prevalence throughout the decades can be possibly attributed to the fact that adolescent prevention programs and efforts primarily address smoking and tobacco usage more than any other type of substance (Leatherdale & Ahmed, 2010).

In comparing separate studies done in each respective country it can be seen that Finnish adolescents report a higher prevalence of having tried smoking as compared to Canadians. However, the rates of current smokers in Canada and Finland seem to be fairly similar with different studies reporting a prevalence of about 19% of adolescents identifying as current smokers in both countries. In both countries there have been government regulations and controls to reduce or eliminate smoking (Canadian Cancer Society, 2015; Hakkarainen, 2013; Propel, 2012; Patja, Samu, Bostrom, Nordgren & Haglund, 2009). Government policies and advertisements highlight the harms to smokers, harms to others and the addictive nature of cigarettes (Canadian Cancer Society, 2015; Propel, 2012; Hakkarainen, 2013). Both countries have laws where individuals have to be 18 years old to purchase cigarettes (Propel, 2012; Hakkarainen, 2013). These laws are in place to limit access and to discourage youth from engaging in these activities (Canadian Cancer Society, 2015). In Canada, there are regulations
and controls on labelling, tobacco promotion, age restrictions where it is necessary by law for retailers to have signs to inform the public of these regulations and where age must be verified with documentation (Propel, 2012). There are similar laws in Finland in every regard (Hakkarainen, 2013). However, with regards to control in some areas of Finland, age verification for sales is not regulated (World Health Organization, n.d.). Lack of enforcement of the age regulations may explain why more adolescents report having tried cigarettes in Finland than in Canada. It is apparent that smoking still persists in adolescent populations in both countries, but both countries have highlighted the negative health effects attributed to this activity. In fact, the government in Finland has proposed bills to become a smoke-free country by 2040 (Hakkarainen, 2013).

The following sections will delve into the discussion of the correlates of smoking among adolescents. Similar to the sections on depressive symptomology (Section 2.1), I will first review the literature on school work pressure as a stressor that leads to smoking behaviours. I will then review how depressive symptomology affects smoking behaviours, and then finally I will review how smoking behaviours are also structured by socio-demographic variables.

### 2.2.2 School Work Pressure and Smoking

Although there is minimal research done on how school work pressure affects smoking behaviours among adolescents specifically, there is some research that suggests that an increase in school work pressure results in increase in smoking frequency or a higher likelihood of adolescents being smokers (BMRB, 2007; Kirby, Van der Sluijs & Inchley, 2008; Sutherland & Shepherd, 2001; Samdal, Nutbeam, Wold & Kannas, 2000; Tyas & Pederson, 1998). A study done in Scotland using the Adolescent Lifestyle and Substance Use Survey (SALSUS) found
that students who were more pressurized by the school work they had to do were more likely to be regular smokers (BMRB, 2007). Similarly, using the Scottish 2005/06 phase of the HBSC Kirby et al. (2008) found that there was a positive association for both boys and girls between school work pressure and both smoking and drinking. Adolescents are more likely to smoke and drink when they are more pressurized by school work. Another study using the Finnish and Norwegian 1994 HBSC found that there is a significant positive correlation between student perceptions of demands of school work from parents and teachers and smoking in both countries. As students feel more pressured by the demands of their teachers and parents with regards to schoolwork then smoking frequency increases (Samdal et al., 2000). Many of these studies using the HBSC use the same measure of school work pressure that will be used in this project.

In summary, some literature finds significant relationships between school work pressure and smoking. Most of this literature suggests that this relationship is due to adolescents smoking in order to cope with the school demands they face (BMRB, 2007; Kirby et al., 2008; Samdal et al., 2000). However, similar to the section reviewing the relationship between school work pressure and depressive symptomology (Section 2.1.2), there are other factors of the school environment that need to be considered that may affect how adolescents perceive school work pressures. An example of this is how much adolescents are satisfied with school (Kirby et al., 2008) and academic achievement (O’Loughlin, Karp, Koulis, Paradis & DiFranza, 2009). For example, students in a study in Scotland who liked school less were more likely to smoke compared to those students that liked school more net of school work pressure (Kirby et al., 2008). These kinds of school indicators will also be considered in models of this project as controls as well.
It has been suggested in the literature that adolescents smoke as a coping mechanism for their depressive symptoms. The next section will explore the relationship between depressive symptomology and smoking behaviours among adolescents.

2.2.3 Depressive Symptoms and Smoking

Much research has shown that there is a close association between depressive symptomology and substance usage among adolescents. In particular there is much research to suggest that clinical depression and depressive symptomology and smoking behaviors are strongly associated with each other (Boys et al., 2003; Dierker et al., 2002; Goodman & Capitman, 2000; Mayfield Arnold et al., 2014; Patton et al., 1996; Pederson et al., 1997; Soteriades & DiFranza, 2003; Tyas & Pederson, 1998). In a study done in the UK on a nationally representative sample of 13-15 year olds, Boys et al. (2003) found that when depression was measured using DSM-IV diagnostic criterion, adolescents with depression were about five times as likely to be regular smokers compared to those adolescents that reported no diagnosis. This relationship was found controlling for other variables such as age, race, socioeconomic status, family variables and other substance usage. Similar results are found in other countries (Fergusson & Woodward, 2002).

In a longitudinal study done on adolescents (12-18 years) in the United States, Escobedo, Reddy & Giovino (1998) measured depression through a depressive symptom scale that measured aspects of depression such as ‘feeling too tired’, ‘feeling unhappy’, ‘feeling depressed’, ‘feeling worried’, ‘feeling nervous’ and ‘having difficulties sleeping’. They found that adolescents who had a baseline of depressive symptoms were 30% more likely to start smoking compared to those adolescents who did not have the baseline of depressive symptoms.
In another study on students from grades 7-12 in the United States, Goodman & Capitman (2000) found that adolescents who had baseline high depressive symptomology (based on symptomology using the Centers for Epidemiological Studies-Depression Scale, CES-D) were 72% more likely to smoke at least one pack per week compared to those that had low depressive symptomology. The relationship between depressive mood symptoms and nicotine usage and dependence is found to be stronger for girls than for boys, as girls often turn to smoking as a coping mechanism more than boys (Mayfield Arnold et al., 2014).

In summary, most of the literature shows that an increase in depressive symptomology results in a higher likelihood in an adolescent being a smoker (Dierker et al., 2002; Goodman & Capitman, 2000; Mayfield Arnold et al., 2014; Patton et al., 1996; Pederson et al., 1997; Soteriades & DiFranza, 2003; Tyas & Pederson, 1998). This is also found when looking at clinical depression (Boys et al., 2003). Although, most of the research in this area suggests this relationship, there are other studies that suggest that this relationship is bidirectional (Chaiton, Cohen, O’Loughlin & Rehm, 2009; Munafo, Hitsman, Rende, Metcalfe & Niaura, 2008). The relationship between depressive symptomology and smoking is complex, as will be discussed further in later sections of this project.

The sections that follow (sections 2.2.4 through 2.2.7) will review the literature on how socio-demographic indicators affect smoking behaviours among adolescents. Similar to the theory of the stress process model that suggests that socio-demographic indicators affect stress outcomes in populations, I suggest that socio-demographic indicators will also affect the external behavioural outcomes that results from depressive symptomology. I will look at the relationship between sex and smoking (section 2.2.4), age and smoking (section 2.2.5), living arrangements and smoking (section 2.2.6), and SES and smoking (section 2.2.7).
2.2.4 Sex and Smoking

Several studies show that there is an effect of sex on smoking behaviours (Harrell, Bangdiwala, Deng, Webb & Bradley, 1998; Matheson et al., 2011; Richardson, Memetovic, Ratner & Johnson, 2011; Voorhees, Schreiber, Schumann, Biro & Crawford, 2002). In particular, sex influences the ‘type’ of smoker an individual is. Studies suggest that boys experiment with smoking at higher proportions than girls. These findings change when examining regular smoking. A Canadian youth and adolescent study suggests that while boys are more likely to be experimental smokers than girls, females are more likely to smoke regularly than males (Harrell et al., 1998). Other studies have found that it is in fact Caucasian females that smoke at higher frequencies than females of other ethnicities and boys (Voorhees et al., 2002). Amos & Bostock (2007) state that smoking has become increasingly gendered because regular smoking is more common for girls than boys in 19 out of 31 European countries.

There are many theories as to why these sex differences in smoking behaviour are observed. Some research suggests that girls are more likely to smoke to manage negative feelings (Richardson et al., 2011). In fact, Richardson et al. (2011) conducted a study on a sample of 1425 adolescents in British Colombia and found that girls score higher on measures of emotional dependence and social attitudes that are related to smoking. Others suggest that there are protective effects of activities that adolescents engage in by gender. For example, Amos & Bostock (2007) found that boys generally are more interested in sports participation than girls. Boys who participated in sports realized that smoking jeopardized their fitness. Research also suggests that girls smoke more for the aesthetic effects of smoking. Some girls who are regular smokers smoke for weight control (Amos & Bostock, 2007). There is also the concern among girls of gaining weight from quitting smoking (Amos & Bostock, 2007). In summary, most of the
literature finds that girls smoke more regularly than boys for varying reasons (Amos & Bostock, 2007; Harrell et al., 1998; Richardson et al., 2003; Voorhees et al., 2002).

### 2.2.5 Age and Smoking

Research looking at age and smoking shows that as age increases, the likelihood of an adolescent smoking will increase as well (Escobedo, Marcus, Holtzman & Giovino, 1993; Harrell et al., 1998; Leatherdale & Burkhalter, 2012; Leatherdale et al., 2008). Much of this is related to pubertal development, where it is found that higher puberty levels increase the odds of smoking initiation and lead to adolescents becoming regular smokers (Harrell et al., 1998). In a study done on a nationally representative sample of US high school students, Escobedo et al. (1993) suggest that smoking initiation rates increase with age. They suggest that the peak age where smoking initiation rates increase is at around 13-14 years old. These rates begin to decrease at the age of 16 years of age. Participants who reported first smoking as young as 12 years of age were more likely to be regular smoker at older ages. Other studies have also found that an increase in age of smoking initiation results in an increase in smoking frequency the younger smoking initiation occurs (Everett, Warren, Sharp, Kann, Husten & Crossett, 1999).

Using the Canadian Youth Smoking Survey (YSS) with a nationally representative sample of students in grade 7-9, Leatherdale et al., (2008) found that in 2004 the mean age of students who reported trying their first cigarette was 12.7 years old and that the prevalence of being a regular smoker increased with age. A follow up study using the 2008 YSS, sampling students from grades 7-12, reported that the percentage of adolescents that smoke increases as grade increases (Leatherdale & Burkhalter, 2012).
Again, most research indicates that children who are older are more likely to smoke than those who are younger (Escobedo et al., 1993; Harrell et al., 1998; Leatherdale & Burkhalter, 2012; Leatherdale et al., 2008). Older adolescents go through many more social pressures and stresses from friends/peers, family and schools (Hoffman, Sussman, Unger & Valente, 2006; Larson & Ham, 1993) and tend to exhibit higher levels of depressive symptomology (Bodur & Kucukkendirci, 2010; Hankin, 2006; Kubik et al., 2003; Poulin, Bourdreaux & Santor, 2005; Rushton, Forcier & Schectman, 2002; Schraedley, Gotlib & Hayward, 1999; Siegel & Griffin, 1984), all of which could contribute to the fact that older adolescents are more likely to smoke.

2.2.6 Living Arrangements and Smoking

There are also significant relationships between the living arrangements of adolescents and smoking behaviours. Most research shows that being in an intact family (biological father and mother) serves as a protector against smoking compared to other types of family arrangements adolescents are a part of (Blum, Beuhring, Shew, Bearinger, Sieving & Resnick, 2000; Doku, Koivusilta, Rainio & Rimpela, 2010; Glendinning & Shucksmith & Hendry, 1997; Griesbach et al., 2003; Miller, 1997; O’Loughlin et al., 2009; Stanton, Oei & Silva, 1994). In a nationally representative study in the US it was found that among both younger and older teens, living in single-parent families is related to higher levels of smoking controlling for income and ethnicity (Blum et al., 2000). Stanton et al. (1994) found that adolescents were more likely to be smokers if their father figure was missing (controlling for other socio-demographic variables such as gender, ethnicity and SES). They suggest that, controlling for gender and other relevant demographics, this happens because the absent father results in adolescents having low social competence which leads to problem behaviours. With regards to smoking initiation in a Canadian context, O’Loughlin et al. (2009) found that among Canadian adolescents, those living
with a single parent have an increased likelihood of starting smoking compared to those living with two parents, controlling for sex and age. A study using the 1998 Health Behaviour in School Aged Children survey found that in Western European countries (including Finland), the odds of being a daily smoker increased if an adolescent lived in a lone-parent family or a step-family compared to living with both biological parents, controlling for gender, family affluence, adolescent income and parental smoking (Griesbach et al., 2003). More specifically in the Finnish context, Griesbach et al. (2003) found that compared to adolescents living with both biological parents, adolescents were about 2 times as likely to be a regular/daily smoker if they came from a single parent family and 3 and a half times as likely to be a regular/daily smoker if they came from a stepfamily. Therefore, in this study the effects are stronger for adolescents that live in stepfamilies than lone-parent families compared to intact families. Similarly, in another Finnish study Doku et al. (2010) found that the odds of being a smoker increased if adolescents came from non-intact families rather than intact families (both biological parents). These odds increased further if an adolescent was a girl and increased with age. The literature on the effects of family arrangement suggests that family relationships are also important. Literature states that positive interactions with both biological parents will result in a lower likelihood of smoking (Miller, 1997; Glendinning, Shucksmith & Hendry, 1997). At times when children come from other family types that are not with both biological parents, these interactions can be impacted negatively (Miller, 1997; Glendinning, Shucksmith & Hendry, 1997).

Thus most of the research in this area shows a relationship between family living arrangement and smoking (Blum et al., 2000; Doku et al., 2010; Glendinning & Shucksmith & Hendry, 1997; Griesbach et al., 2003; Miller, 1997; O’Loughlin et al., 2009; Stanton et al., 1994). Research suggests that family relationships and interactions play an integral role in the
effect of family living arrangements and smoking behaviours (Miller, 1997; Glendinning, Shucksmith & Hendry, 1997). While I am not able to control for family relationships and interactions in my study, I do expect to find that adolescents that live in family arrangements that are not with both biological parents will be more likely to smoke than those that live with both parents.

2.2.7 Socioeconomic Status and Smoking

Literature on the relationship between socioeconomic status and cigarette smoking varies. The relationship is less apparent with adolescents as opposed to adults (Reid, McNeill & Glynn, 1995). It is much more difficult to measure SES of adolescents and usually SES of adolescents is measured based on indicators of the family (Reid et al., 1995). Most research done on adults finds that there is a higher prevalence of smoking among individuals with lower socioeconomic statuses (Barnett, Pearce & Moon, 2009; Bryant, Bonevski & Paul, 2011; Cavelaars, Kunst & Geurts, 2000; Dube et al., 2009; Hiscock, Bauld, Amos, Fidler & Munafo, 2012; Kunst, Giskes & Mackenbach, 2004; Laaksonen, Rahkonen, Karvonen & Lahelma, 2005; Reid, Hammond & Driezen, 2010). Research on adolescents also suggests that there is a negative relationship between SES and smoking, where a decrease in SES results in an increased likelihood of being a smoker and being a more frequent smoker (Finkelstein, Kubzansky & Goodman, 2006; Hurre et al., 2003; Stanton et al., 1994; Waldron & Lye, 1990; White, Nagin, Replogle & Stouthamer-Loeber, 2004). Research using the Pittsburgh Youth Study (PYS), which measured SES using an index which measured parental education and occupation, found that lower SES was a significant predictor of adolescents being heavy or regular smokers and belonging to a higher SES was a predictor of adolescents being non-smokers (White et al., 2004). A study done in Finland with a nationally representative sample of 16 year olds found similar results. Hurre et al. (2003) found...
that for both genders being in a lower economic status (based on father’s occupation) resulted in adolescents being more frequently daily smokers. Similarly, using the 1998 Health Behaviour in School-aged Children survey, Griesbach et al. (2003) found that the odds of being a daily smoker increased when 15 year olds belonged to lower SES compared to those that belonged to a higher SES category.

Other socioeconomic studies show that there is a positive relationship between SES and smoking behaviours for adolescents, such that a higher SES results in a higher likelihood of smoking or increased smoking frequency (Johnson, Simons & Conger, 2004; Soteriades & DiFranza, 2003). These studies usually look at how much spending money, allowance or disposable income adolescents have. For example a study that measured SES using an indicator that measures whether adolescents have spending money or allowance (Johnson et al., 2004) found that there was a positive relationship between adolescents having spending money and smoking frequency. Another study also found that when looked at weekly allowance separately they found that having a weekly allowance increased the odds of an adolescent being a smoker. However, this relationship became insignificant when adding household income. The relationship found there was negative, where being in high household income category reduced the odds of an adolescent being a smoker (Soteriades & DiFranza, 2003).

There are also studies that suggest that there is no relationship between SES and adolescent smoking. Bergman & Scott (2001) use data from the British Household Panel Study (BHPS) that gathered information from 11-15 year olds and found that SES (looking at income, father’s occupation and whether family owns a house or rents) does not have a significant effect on whether adolescents smoke or not, controlling for gender and other socio-demographic
indicators such as family arrangements. Thus the literature suggests there is wide variation on how SES of a family affects smoking behaviours among adolescents.

In summary, although it is more difficult to measure the socioeconomic status of adolescents, most literature shows that the lower the economic status of individuals the more likely adolescents are to smoke (Finkelstein et al., 2006; Hurre et al., 2003; Stanton et al., 1994; Waldron & Lye, 1990; White et al., 2004). There are some discrepancies regarding how SES is associated with smoking among adolescent research. Most of these discrepancies arise due to differences in how SES is measured. When SES is measured more precisely with indicators of the parents such as income, education, and occupational status, adolescents with low SES are more likely to report smoking (Finkelstein et al., 2006; Hurre et al., 2003; Stanton et al., 1994; Waldron & Lye, 1990; White et al., 2004). However, if SES is measured by how much extra money adolescents have then there is a positive relationship between SES and smoking because they are able to afford cigarettes personally (Johnson et al., 2004; Soteriades & DiFranza, 2003). My research will measure SES through a self-perceived measure of family affluence. Although it is not the same measure of SES used in other studies that measure SES through parental income, education or occupational status, I expect to see similar results to the literature that states an increase in family SES results in a lower likelihood or prevalence of adolescent smoking.

2.3 Alcohol Usage Literature

The second health risk behaviour that is examined in this project is alcohol usage. Literature also shows that depressive symptomology affects drinking behaviours among adolescents (Boys et al., 2003; King et al., 2004; Kwon, 2013; Nation & Heflinger, 2006). The following section will review the relationship between depressive symptomology and alcohol
consumption. First, I will provide information on the prevalence of alcohol usage among adolescents in both Canada and Finland. Then there will be a discussion of the literature on the relationships between the focal variables of school work pressure and depressive symptomology on alcohol usage, and finally I will conclude by exploring the relationship between socio-demographic variables and alcohol usage among adolescents. I will explore the literature on the effects of sex, age, family arrangement and socioeconomic status on alcohol consumption.

2.3.1 Prevalence of Alcohol Usage

Like smoking, alcohol drinking patterns are usually established during early adolescence (Bendsten et al., 2014; Eaton et al., 2012; Hibell et al., 2012; Johnston, O’Malley, Bachman & Schulenberg, 2010; Leatherdale & Ahmed, 2010; Redonnet, Chollet, Fombonne, Bowes & Melchior, 2012; Song, Smiler, Wagoner & Wolfson, 2012; Swendson et al., 2012). Some research suggests that in many countries alcohol is more frequently used by adolescents compared to cigarettes (Eaton et al., 2012; Johnston et al., 2010; Gadalla, 2012; Hibell et al., 2012; Leatherdale & Ahmed, 2010; Leatherdale et al., 2008; Redonnet et al., 2012). In the 2006 Canadian Youth Smoking Survey, which examined a nationally representative sample of 7-9th graders, Leatherdale & Ahmed (2010) found that 59.1% of adolescents reported ever trying alcohol in their lives. Of those who reported trying alcohol, 38.5% reported binge drinking at least once. They also found that the prevalence of ever trying alcohol increased between 2002 and 2006. Similarly, another Canadian study that uses the 2007/2008 Canadian Community Health Survey found that for adolescents aged 12-14 years old, 13.5% report being occasional drinkers and 3.9% report being regular drinkers. For adolescents aged 15-17 years old, 26% report being occasional drinkers and 34.3% report being regular drinkers (Gadalla, 2012). A study done using the 2011 European survey Project on Alcohol and other Drugs (ESPAD) found
that in the 30 days prior to the survey being administered, 48% of 15-16 year olds in Finland reported alcohol usage. Thirty-five percent reported heavy episodic drinking during that time period. Compared to the other 35 European countries in this study, adolescents from Finland reported drinking less often but in larger quantities (Hibell et al., 2012).

Based on the prevalence of smoking assessed in section 2.2.1 above, it is seen that rates of alcohol consumption are higher than smoking. There is a higher prevalence of adolescents who report drinking on a regular basis as compared to smoking on a regular basis. Research suggests that this could be due to the fact that adolescents report high pressure to drink and alcohol use is more socially acceptable than smoking (Kiuru, Burk, Laursen, Salmela-Aro & Nurmi, 2010).

It should also be noted that adolescents are drinking even when in both Canada and Finland the legal drinking age of each country is 18 years of age (Hansen, 2015). To be more specific, in Canada the legal drinking age in three provinces is 18 years of age (Alberta, Manitoba and Quebec) and in the rest of Canada it is 19 (Canadian Centre on Substance Abuse, 2013). Although regular drinking is much more culturally acceptable in some parts of the world, drinking has become a global health concern because it can lead to premature death through impaired driving and is responsible for causing many diseases such as fetal alcohol syndrome, cancers, liver and cardiovascular diseases (Beaglehole & Bonita, 2009; Collin, 2006; Gilmore, 2009; Rehm et al., 2009). In Canada, alcohol consumption and the negative effects of problem drinking are regulated by provinces through the institution of the minimum legal drinking age that require identification to purchase, outlet density restrictions, restricted hours and days of sale, sobriety check points, lowered blood alcohol levels, licence suspensions, etc.(Collin, 2006).

This is similar in Finland. However, European cultures are known to be more culturally
accepting of alcohol than other parts of the world (Jarvinen & Room, 2007). Producing alcoholic beverages is an integral part of the economy of many European countries and plays an important role in the culture of many European countries (Jarvinen & Room, 2007). This has led to many alcohol related problems in adolescent populations (Rehm et al., 2001). With regards to Finland, Finns are usually characterized as a people that are “hard drinkers” due to being proud and self-willed (Jarvinen & Room, 2007). This is a culture that has also transpired into adolescent drinking culture in Finland. Although Finland is one of the European countries where adolescents drink less frequently, they report drinking more heavily when they do drink compared to adolescents in other countries in Europe (Jarvinene & Room, 2007). This could explain why the prevalence of heavy episodic drinking is much higher in Finland when compared to Canada.

The following sections will delve into the discussion of the correlates of alcohol consumption among adolescents. Similar to the sections of depressive symptomology and smoking behaviours (Section 2.1 & 2.2), I will review the literature on school work pressure as a stressor that leads to alcohol consumption. I will then review how depressive symptomology affects smoking behaviours as a coping mechanism and then finally I will review how trends in alcohol consumption are also structured by socio-demographic variables. I will start with a discussion on how school work pressure is related with alcohol consumption among adolescents.

2.3.2 School Work Pressure and Alcohol Usage

Although sparse, there is some research that establishes that there is a relationship between school-related stress (including schoolwork pressure) and drinking behaviors among adolescents (Desousa, Murphy, Roberts & Anderson, 2008; Karatzias et al., 2001; Kirby et al.,
There are many types of indicators that can be used as a measure of school work stress (Alban Metcalfe, Dobson, Cook & Michaud, 1982). These can include measures of pressure and stress from exams, school work, noise in school, and rigid deadlines (Karatzias et al., 2001). This project will be using a single measure of school stress and that is pressure to fulfill demands of actual school work. This measure has also been used in part in literature in relation to alcohol usage (Desousa et al., 2008; Kirby et al., 2008; Samdal et al., 2000; Harakeh, De Looze, Schrijver, Van Dorsselaer & Vollebergh, 2012). Overall, most of this literature finds that there is a positive relationship between school work pressure and alcohol consumption. A study done on Scottish school-aged children using the HBSC discovered that there was a significant correlation between being pressured by schoolwork and using alcohol. They found that the more pressure a student reports the more frequently alcohol is consumed (Kirby et al., 2008). Samdal et al. (2000) also found that there was a significant positive correlation between the amount of schoolwork pressure that parents and teachers place on adolescents and frequency of alcohol consumption and frequency of being inebriated. This study was a cross-national comparison between Norway and Finland and this relationship was found in both countries. Similar results are found in studies that use school work pressure as a part of measures of school stress. A study on Croatian school-aged children used the HBSC to measure the effect of unfavorable school conditions on becoming inebriated. Part of the measure of unfavorable school conditions included the measure that is being used in this project- how much school work pressure do you feel? The effect of school work pressure was not necessarily teased apart from the measure of unfavorable school conditions but it does give an indication that an increase in school work pressure resulted in an
increased likelihood of students reporting being inebriated. This is similar when looking at Chinese adolescents (Unger et al., 2001).

Within this literature it is also important to look at the drinking behaviour. Karatzias et al. (2001) found that among Scottish adolescents when controlling for significant demographics and school and personality factors, the most important factor in predicting experimentation with alcohol was school work stress. This was not the case for continual usage of alcohol. Conversely, studies done on binge drinking report opposite effects between school-related stress and binge drinking such that students who report having less school work pressure were more likely to binge drink compared to those with more school work pressure (Desousa et al., 2008). However, a study using the Dutch version of the HBSC reported no significant relationship between school work pressure and binge drinking (Harakeh et al., 2012).

My research situates itself in the literature that finds a positive effect of school work pressure on frequency of alcohol consumption (Desousa et al., 2008; Kirby et al., 2008; Samdal et al., 2000; Harakeh et al., 2012). However, Bryant, Schulenberg, O’Malley, Bachman & Johnston, (2003) state that we should not look just at the effects of academic pressures on alcohol usage. They found that when adolescents report higher levels of interest in school, school effort, school bonding and college plans, they were less likely to report alcohol usage compared to those that report lower levels of each aspect. Others look at positive school environments which include measures of liking schooling, academic achievement and school work pressure in relationship to alcohol usage (Simetin et al., 2011; Unger et al., 2001). Taking this literature into account I will also include variables such as academic performance and school satisfaction as controls and observe if there is a relationship between school work pressure and alcohol usage net of other school factors.
The next section will explore the relationship between depressive symptomology and alcohol consumption among adolescents. It has been suggested in the literature that adolescents drink as a coping mechanism for their depressive symptoms. The following section will explore this and review relevant research in establishing associations between the two variables.

2.3.3 Depressive Symptoms and Alcohol Usage

There is much debate over determining causal relationships between depressive symptomology and alcohol usage. There is research to suggest that alcohol use can lead to depression or depressive symptoms. However, there is also evidence to suggest that depressive symptomology can lead to alcohol consumption (Boden & Fergusson, 2011). Research suggests that alcohol usage and depression are comorbid disorders and therefore it is difficult to determine unidirectional causal pathways (Swedsen & Merikangas, 2000). In a meta-analysis study done on the relationship between the two variables (not specifically on adolescents), Boden & Fergusson (2011) suggest that there is a more apparent link where alcohol disorders affect depressive symptomology. However, in adolescent research it is more prevalent to suggest that psychological distress and depression/anxiety influence alcohol behaviours and problem usage (Boys et al., 2003; King et al., 2004; Kwon, 2013; Nation & Heflinger, 2006). In an American study, Nation & Heflinger (2006), found a positive relationship between self-reported depression symptoms and frequency of alcohol consumption. They suggest that very little is known about the causal relationship between psychological distress and substance usage such as alcohol. But that research suggests that psychological problems may result in risk or increase vulnerability to abuse substances. Another study conducted on a nationally representative sample of 13-15 year olds in England, Wales and Scotland found that adolescents are more likely to be regular drinkers if they had been diagnosed with depression compared to those that have not been
diagnosed with depression, controlling for gender, age, ethnicity, family arrangement, SES, smoking and cannabis usage (Boys et al., 2003). Similarly, in a longitudinal twin study in the United States, King et al. (2004) found that the only internalizing disorder at age 11 that had a significant effect on the odds of alcohol usage at age 14 was depression/anxiety. Students who reported having depression/anxiety at younger ages were found to have increased odds of alcohol usage at age 14 compared to those who didn’t report depression or anxiety. Research that explores these relationships suggests that this mechanism occurs because adolescents try to reduce or relieve tension or stress (Boys et al., 2003; King et al., 2004).

In summary, this research project is interested in evaluating if there is an effect of depressive symptomology on alcohol usage. Some of the literature that was presented shows that there is an effect where an increase in depressive symptomology results in a higher likelihood of alcohol consumption among adolescents (Boys et al., 2003; King et al., 2004; Kwon, 2013; Nation & Heflinger, 2006). However, similar to the smoking literature there is a debate on bidirectionality between alcohol consumption and depressive symptomology (Boden & Fergusson, 2011). This reflects the complex nature of the relationship between depressive symptomology and substance usage and is something that will be discussed further in later sections of this project.

The next sections that follow (sections 2.3.4 through 2.3.7) will review the literature on how socio-demographic indicators affect alcohol consumption among adolescents, looking at the relationship between sex and alcohol consumption (section 2.3.4), age and alcohol consumption (section 2.3.5), living arrangements and alcohol consumption (section 2.3.6) and SES and alcohol consumption (section 2.3.7).
2.3.4. Sex and Alcohol Usage

The relationship between sex and alcohol usage among adolescents is sometimes unclear (MacArthur et al., 2012), especially since drinking behaviours between boys and girls have been changing over time (Lintonen, Rimpela, Ahlstrom, Rimpela & Vikat, 2000). Generally, in adolescence, boys report drinking more frequently and report higher rates of problem drinking than girls (Chen & Jacobson, 2012; Currie, 2008; Habib, Santoro, Kremer, Toumbourou, Leslie & Williams, 2010; Leatherdale et al., 2008; Leatherdale & Burkhalter, 2012; Kwon, 2013; Lintonen et al., 2000; Poikolainen et al., 2001; Small, Suzuki & Maleku, 2014). However, these findings vary with the kind of drinker an individual is (Currie, 2008). In a comparative international report using the 2005/2006 data of the HBSC, Currie (2008) found that it is more common for boys to drink at least one type of alcoholic beverage every week compared to girls. This relationship was found to be significant in most countries (including Canada and Finland) at all ages (11, 13 and 15 year olds). With regards to drinking to the point of drunkenness (studying only 15 year olds), Currie (2008) found that boys are most likely to report being drunk than girls in about half of the countries. However, this relationship was not significant for Canada and Finland. In these two countries there was no difference in reports of drunkenness between boys and girls. Schulte, Ramo & Brown (2009) found that boys are at higher risk to consume more alcohol and engage in more disruptive drinking compared to girls. In another study done in 11 European countries including Finland it was found that females engage in heavy drinking less frequently than males. However, this finding varied between the countries (Bjarnason, Davidaviciene, Miller, Nociar, Pavlakis & Stergar, 2003).

There are many reasons that drinking patterns vary by sex. These risk factors can include peer/social factors (Bahr, Hoffmann, & Yang, 2005; Flannery, Vazsonyi, Torquati, & Fridrich,
1994; Hawkins, Catalano & Miller, 1992; Kung & Farrell, 2000; Li, Pentz, & Chou, 2002; Reed & Roundtree, 1997; Thornberry & Krohn, 1997), parental involvement (Borawski, Ievers-Landis, Lovegreen & Trapl, 2003; CASA, 2003; Foxcroft & Lowe, 1995; Husler & Plancherel, 2006; Kung & Farrell, 2000), and community factors (Beyers, Toumbourou, Catalano, Arthur, & Hawkins, 2004; Hawkins et al., 1992; Newcomb & Felix-Ortiz, 1992). Theories as to why boys exhibit more disruptive drinking behaviours suggest that boys experience greater rates of perceived peer alcohol usage and socialization into traditional masculine gender roles (Schulte, Ramo & Brown, 2009). Studies also suggest that girls report more monitoring from family members compared to boys and can thus potentially results in the trends that are seen today (Borawski et al., 2003; Flannery, Vazsonyi, Torquati & Fridrich, 1994; Rai et al., 2003).

In findings specific to countries in my research, some research in Canada using the 2004 Canadian Youth Smoking Survey suggests that in a nationally representative sample of adolescents in grades 5-9, boys are approximately 32% more likely to have tried alcohol compared to girls (Leatherdale et al., 2008). In a follow up study using the 2009 cycle of the survey, Leatherdale & Burkalter (2012) found that for adolescents between grades 7-12, males were also more likely to report current alcohol usage. Studies conducted in Finland on a representative sample of youth aged 15-19 found that boys are significantly more likely to be heavy drinkers compared to girls (OR=5.3) (Poikolainen et al., 2001). However, other Finnish studies show that these relationships have changed over time and are largely associated with age (Lintonen et al., 2000). In a longitudinal study from 1977-1999, Lintonen et al., (2000) found that in the earlier years of the study boys reported higher frequencies of recurring drunkenness. However, as the years progressed this difference between boys and girls diminished. They also found that girls reported less drinking to the point of drunkenness as they got older, but that they
reported drinking at earlier ages than boys. For boys it was found that they report drinking at older ages than girls but that drinking to the point of drunkenness increased with age. Therefore, in Finland it is seen that girls are drinking more frequently over time (though less in quantity compared to boys) and at earlier ages, but this starts levelling off as they age. Lintonen et al., (2000) attribute this to biological factors (girls mature faster than boys) and social aspects of girls’ lives (for example, girls dating boys that are older than them).

In summary, most literature suggests that males tend to drink more frequently and tend to be heavier drinkers than females but that these trends are changing over time (Chen & Jacobson, 2012; Currie, 2008; Habib et al., 2010; Leatherdale et al., 2008; Leatherdale & Burkhalter, 2012; Kwon, 2013; Lintonen et al., 2000; Poikolainen et al., 2001; Small et al., 2014).

2.3.5 Age and Alcohol Usage

Most research in this area suggests that as age increases so does the frequency of alcohol use (Currie, 2008; Flewelling & Bauman, 19990; Habib et al., 2010; Hamilton, van der Maas, Boak & Mann, 2013; Leatherdale & Burkhalter, 2012; Leatherdale et al., 2008; Lintonen et al., 2000). This is also the case for binge alcohol usage (Habib et al., 2010). In the international report using the 2005/2006 data of the HBSC, Currie (2008) reports that in most participating countries in the project, weekly drinking increases between 11-15 year olds for both boys and girls. The greatest increase in weekly drinking was observed between the ages of 13-15 years of age. Using regression analysis, another study shows that as age increases the likelihood of reporting current alcohol usage as well as binge drinking increases as well (Habib et al., 2010).

In a regionally representative sample of adolescents in grades 7-12 in Ontario, Hamilton et al. (2013) used the Ontario Student Drug Use and Health Survey and determined that as age
increased the likelihood of being a regular drinker compared to being a non-drinker increased (OR=1.59 for a one year increase in age). This is also consistent with other studies using nationally representative samples of Canadian adolescents (Leatherdale et al., 2008). Leatherdale et al. (2008) and Leatherdale & Burkhalter’s (2012) studies suggest that as the grade of a student increases, the likelihood of trying alcohol compared to never trying increases, and prevalence of alcohol consumption increases. In a Finnish study it was found that in general, as age increased alcohol consumption also increased (Lintonen et al., 2000).

Based on the literature it is apparent that there is a relationship between age and alcohol consumption where, as age increases both the consumption of alcohol and the likelihood of disruptive drinking increase as well (Currie, 2008; Flewelling & Bauman, 19990; Habib et al., 2010; Hamilton et al., 2013; Leatherdale & Burkhalter, 2012; Leatherdale et al., 2008; Lintonen et al., 2000). I will expect to find similar results in my own project in both countries.

2.3.6 Living Arrangements and Alcohol Usage

There are significant effects of living arrangements on alcohol usage among adolescents. Most research looks at the relationship between living in a family with two biological parents versus living in a non-intact family (single parent or stepfamilies) on alcohol behaviours. They find that there is a protective factor in living with both parents, as adolescents who live in this type of family usually report less alcohol usage of any kind compared to adolescents who live in other living arrangements (Bjarnason et al., 2003; Blum et al., 2000; Flewelling & Bauman, 1990; Habib et al., 2010; Hamilton et al., 2013; Isohanni, Oja, Moilanen & Koiranen, 1994; Kwon, 2013; Ledoux, Miller, Choquet & Plant, 2002; Miller, 1997; Small et al., 2014; Vanassche, Sodermans, Matthijs & Swicegood, 2014 ). A study based on the 1999 European
School Survey Project of Alcohol and other Drugs (ESPAD) found that in 11 European countries, including Finland, heavy drinking is more frequent among adolescents living in non-intact families compared to living with both biological parents, controlling for SES, gender and adolescent drinking culture (Bjarnason et al., 2003). Small et al. (2014) conducted a study on nationally representative sample of American 8th-12th graders. They categorized their family arrangement variable in order to see the effects of living in lone parent families compared to two biological parent families. They found that adolescents who live with a single mother or a single father or in other arrangements (with a grandfather or grandmother, in a foster home or somewhere else) are more likely to drink 5 or more drinks in a row in the past 2 weeks. Compared to living with both biological parents the odds of drinking 5 or more drinks in a row are lowest for adolescents that live with a single mother, followed by a single father and highest for adolescents that live in other arrangements. In a study using a representative sample of Ontario students in grades 7-12, Hamilton et al. (2013) found that the odds of being a regular drinker decreases by about 22% if adolescents live with two biological parents compared to adolescents that live in any other kind of arrangement, controlling for gender, subjective SES, parental education and ethnicity. There is definitely a consensus in the literature that living in families where both biological parents are present results in less drinking behaviours among adolescents compared to adolescents living in other family types. As in the case of smoking this can be attributed to deficiencies in parental interaction and parental control (Bjarnason et al., 2003). With regards to family involvement, research shows that better parental monitoring results in a decrease in alcohol consumption (Schulte, Ramo & Brown, 2009).

In my research I expect to find a relationship where living in family arrangements other than with two biological parents will contribute to adolescents drinking alcohol. This is what
most of the research in this area shows (Bjarnason et al., 2003; Blum et al., 2000; Flewelling & Bauman, 1990; Habib et al., 2010; Hamilton et al., 2013; Isohanni et al., 1994; Kwon, 2013; Ledoux et al., 2002; Miller, 1997; Small et al., 2014; Vanassche et al., 2014). However, just like in smoking research, alcohol research suggests that family relationships and interactions play an integral role in the effect of family living arrangements and alcohol consumption (Bjarnason et al., 2003; Borawski et al., 2003; Flannery et al., 1994; Rai et al., 2003). Because I am not able to control for any of these relational variables in my project, I expect to find that adolescents that live in family arrangements that are not with both biological parents will be more likely to consume alcohol than those that live with both parents.

2.3.7 Socioeconomic Status and Alcohol Usage

Similar to the research on smoking, literature on the effect of SES on alcohol consumption varies (Elgar, Roberts, Parry-Langdon & Boyce, 2005; Hansen & Chen, 2007; Richter, Leppin & Gabhainn, 2006). In a meta-analysis study conducted by Hansen & Chen (2007), it was found that there are studies that present negative, positive and no relationships between the two variables. In an international study based on the HBSC 2005/2006 report, researchers found that that there is a relationship between SES and alcohol usage but it is not apparent throughout all the countries. In many of the 42 countries, high SES was significantly associated with higher rates of adolescents drinking every week. However, some countries also showed that there was no significant association between these two variables. This was the case in the countries of Canada and Finland. Interestingly, when looking at drinking to the point of drunkenness, there are far fewer countries that report a significant relationship between family affluence and drunkenness. Those countries that do show a relationship suggest that it is negative (Currie, 2008). In a cross national comparison, Liu, Wang, Tynjala, Villber, Lv & Kannas (2013)
found that there was a clear relationship between socioeconomic status and alcohol usage in school aged children in China. They found that adolescents that were part of the higher family affluence scale were more likely to drink more monthly and get drunk more than adolescents lower on the family affluence scale. This was not the case however with adolescents in Finland. They found no relationship between family affluence and drinking among school aged children in adolescents in that country. This is largely attributed to the fact that the division between the rich and the poor in Finland is far less apparent than in other parts of the world like China. In a developing country such as China only adolescents in which families could afford alcohol and thus be more exposed to alcohol (based on the family affluence scale) would be more likely to drink (Liu et al., 2013). Similarly, in research done in other developing countries the same results were found to those of the results found in China (Almeida-Filho et al., 2005; Ferrence, 2001; Ritterman et al., 2009). A Canadian study found that both perceived SES and parental education did not increase or decrease the likelihood of drinking occasionally or regularly compared to not drinking (Hamilton et al., 2013). However in a study done on 11 countries in Europe, including Finland, researchers found that high perceived family SES was associated with less frequent heavy drinking (Bjarnason et al., 2003).

In summary, the literature suggests that the relationship between socioeconomic status and alcohol consumption is unclear, and perhaps the mechanism regarding how SES affects drinking in adolescents is more intricate than expected and highlights the need for further study. Much of the literature seems to suggest that there really is no association between SES and alcohol consumption (Currie, 2008; Hamilton et al., 2013; Hansen & Chen, 2007; Liu et al., 2013; Richter et al., 2006), unless adolescents are in countries with high income inequality (Almeida-Filho et al., 2005; Ferrence, 2001; Liu et al., 2013; Ritterman et al., 2009). These
findings can be attributed to the fact that out of all the substances that adolescents consume, alcohol is the most accessible and the most prevalently used (Canadian Centre on Substance Abuse, 2013; Jarvinene & Room, 2007; Leatherdale & Ahmed, 2010; Leatherdale & Burkhalter, 2012; Leatherdale et al., 2008) and if adolescents are in developed countries then perhaps SES does not play an integral role in determining alcohol consumption.

The previous literature review explored the correlates of a health outcome and health risk behaviours. Section 2.1 showed how school work pressure affects depressive symptomology among adolescents. It also showed how depressive symptomology is structured and affected by socio-demographic indicators. These indicators include sex, age, family living arrangement and SES. Similarly, sections 2.2 and 2.3 reviewed literature that shows how there are also associations between the same socio-demographic indicators and smoking and alcohol usage among adolescents. Most importantly, it showed that school work pressure and depressive symptomology are also significantly associated with both smoking and alcohol usage.

The next chapter in this thesis will elaborate on the methodology that is used to explore all these relationships. The following chapter will explain the data source (section 3.1) and the research questions and models that guided this research (section 3.2). Finally, the chapter concludes by explaining the measures that were used to operationalize all the concepts highlighted in the literature review (section 3.3) and a review of the statistical methodologies used in the project (section 3.4).
Chapter 3: Research Design & Methods

3.1 Data source/sample

This thesis is based on an analysis of the 2005/2006 Health Behaviour in School-Aged Children (HBSC) survey conducted in collaboration with the World Health Organization. The HBSC is an inter-disciplinary, cross-national data collection collaboration. Cross-sectional data are collected every four years from students in over 40 countries. The HBSC was one of the first international surveys on adolescent health (Roberts et al., 2009). The survey started as a collaborative project between England, Finland and Norway, and has expanded to include 43 countries around the world. The study aim is to understand youth’s health in their social environment (HBSC, 2015). The project has a double mission: to monitor policy development, and to further develop research on adolescent health (Roberts et al., 2009). The HBSC provides a source of information on demographic factors, social background factors, social context, health outcomes, health behaviours and risk behaviours of youth in the various member countries.

The HBSC is administered by a local institution in each member country. In order to ensure that data come from a representative sample in each country, protocols to achieve such samples are outlined for each country through sampling guidelines. Before samples are obtained, the research team in each country is required to finish a sampling questionnaire that questions the research teams on proportions of students being held back or advanced (this could affect the age samples for each grade necessary), how students will be sampled, sampling frame of schools, stratification processes, dealing with non-response and additional support to accommodate for language groups or geographic regions in each country (Roberts et al., 2009). In order to ensure
that guidelines are met in each member country, sanctions for non-adherence are administered for data not accepted as valid for comparison (Currie, Gabhainn & Godeau, 2009).

The target population for the HBSC sample is youth aged 11, 13 and 15 years old. These ages were chosen because they are ages that represent both the onset of adolescence, when physiological changes are occurring in youth, as well as middle adolescence, when important life decisions are potentially being made (Roberts et al., 2009). A cluster sample design is employed. Schools or school classes are selected first (as the primary sampling unit), and then students within these schools or classes are surveyed. If a frame of classes is not available in a country, then schools are selected (Currie et al., 2008). Each country is given the option to stratify their samples in order to ensure representation by geography, ethnic groups and school types. The survey is administered in classrooms (Roberts et al., 2009). Consent was obtained at many different levels. These include school boards, schools, parents and children (Saab and Klinger, 2010). Most, if not all, of the data collected is self-reported, and thus based on the participants’ own perceptions. Although this may seem problematic, there is sufficient evidence to suggest that questionnaires administered this way are substantially reliable, especially for self-rated health outcomes (Lundberg & Manderbacka, 1996; Shain, Naylor & Alessi, 1990).

Non-response bias is an issue that the HBSC endeavours to address. Each nation addresses non-response individually. Some countries oversample, while others use a method where they will have pre-selection replacement schools, and others will use a combination of both. A large issue for in-school surveys is the fact that students who are absent on the day the survey is administered do not complete the survey. Thus those who are more frequently absent are disproportionately missing from the data (Roberts et al., 2009). Such non-response issues can raise problems for analysis depending on the research interests. Non-response due to absence is
definitely a concern for this research project, which focuses on depressive symptomology. Children who exhibit symptoms of depression are more likely to be unable to or refuse to attend school (DeSocio & Hootman, 2004; Egger, Costello & Angold, 2003; Kearney, 2008). Therefore, the HBSC data could potentially underestimate the prevalence of depressive symptomology among youth. With all of these considerations in mind, the 2005/2006 survey obtained a level of response rate that exceeded 70% in most nations (Roberts et al., 2009).

The 2005/2006 sample in Canada consisted of 5930 students. These students were randomly selected from 187 publicly funded schools. In Canada, the survey is administered by Queen’s University. Schools and classrooms were chosen to reflect the distribution of students from grades 6-10 in the Canadian population. The schools were chosen using weighted probability techniques to make sure that the sample was representative by regional geography and demographic features. Data were obtained from students in all 10 provinces and three territories. Ethics approval was obtained from Queen’s University General Research Ethics Board. Consent was obtained at many different levels which include school boards, schools, students and their parents. The final response rate of participants was 74.2% (Saab & Klinger, 2010).

I also compare findings to the Finnish 2005/2006 data. The institution that runs the survey in Finland is the department of health sciences in the University of Jyvaskyla (Ojala, Tynjala, Valimaa, Villber & Kannas, 2012). The sample in this country consisted of 5249 students. These students were randomly selected from 99 different schools in the entire country. Finland also followed similar ethics approval as Canada as all countries are responsible to go through education authorities and research ethics committees to receive funding and ethics
approvals (Currie et al., 2008). The response rate for the study in the Finnish sample was 85% (Ojala et al., 2012).

3.2 Research Questions & Models

Many World Health Organization reports using the Health Behaviour in School-Aged Children data provide extensive descriptive representations of national distributions of many of the variables in question in this project (Currie et al., 2008). In cross-national research using the HBSC, Canadian and Finnish data are usually compared with long lists of countries that are part of the HBSC project (Haugland, Wold, Stevenson, Aaroe & Woynarowska, 2001; Janssen et al., 2005; Johnson, Krug & Potter, 2000; Schmid et al., 2003). This project will attempt to add to this research area by comparing Canadian and Finnish samples exclusively in order to provide a more in depth comparison of the effect of school work pressure on depressive symptomology in both countries. This is done in order to try to understand how the different contexts between these two countries might affect the impact of school work pressure on adolescent mental health. In order to perform these comparisons, all analyses will be run separately for Canada and Finland, comparing results throughout.

As reviewed in the literature, socio-demographic factors play an important role in explaining the mental health of individuals. Age and sex (Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994; Twenge & Nolen-Hoeksema, 2002), socio economic status (SES) (Barret & Turner, 2005; Bradley & Corwyn, 2002; Gore, Aseltine & Colten, 1992; Kubik et al., 2003; Rushton, Forcier & Schectman, 2002; Saab & Klinger, 2010; Saaman, 2000; Siegel & Griffin, 1984; Torikka et al., 2014; Wight, SepUlveda & Aneschensel, 2004) and living arrangements (Gore, Aseltine & Colten, 1992; Greenberger et al., 2000; Restifo & Bogels, 2009;
Kaltiala-Heino et al., 1999; Samm et al., 2010; Torikka et al., 2001) are key correlates of the varying levels of mental health outcomes such as depressive symptomology among adolescents. My first research question will add to this substantive area by using the HBSC and comparing the influence of socio-demographic factors on symptoms of depression among adolescents in Canada and Finland.

Research Question 1: How do socio-demographic variables affect depressive symptomology in adolescents in Canada and Finland?

As discussed in the literature review, school work pressure has negative effects on mental health in students (Ang & Huan, 2006; Anderman, 2002; Davis et al., 2002; Karvonen & Rimpela, 2005; Lee & Larson, 2000; Low et al., 2012; Verma, Sharma & Larson, 2002). The next research question in this project attempts to evaluate the effects of school work pressure on mental health of adolescents in both nations, while controlling for socio-demographic variables.

Research Question 2: Net of all socio-demographic variables, does school work pressure affect depressive symptomology among adolescents in Canada and Finland?

The third research questions will address the issue of other correlates of depressive symptomology and mental health in adolescents. These include variables such as self-rated health (Keenan-Miller, Hammen & Brennan, 2007), life and school satisfaction (Proctor, Linley, Maltby, 2009; Baker, Dilly, Aupperlee & Patil, 2003) and academic achievement (Pomerantz et al., 2002). These variables were selected because they are variables that are related with both the focal variables of school work and the dependent variable, depressive symptomology, among this demographic group. The third research question will observe the patterns of these correlates to depressive symptomology but most importantly evaluate whether or not school work pressure
has a significant effect on depressive symptomology when controlling for these correlates as well as socio-demographic variables.

Research Question 3: Net of all socio-demographic variables and other correlates (self-rated health, life and school satisfaction and academic achievement), does school work pressure have an effect on depressive symptomology among school-aged adolescents in Canada and Finland?

My fourth research question addresses the possibility that the relationship between school work pressure and depressive symptomology may vary across demographic groups. Pomeratz and [his/her] colleagues (2002) suggest that there are gender differences in the relationship between academic stress and depressive symptomology. They report that girls worry and stress more about their academic performance more than boys. I investigate whether four socio-demographic variables - gender, age, SES and family living arrangements - affect the existing relationship between school work pressure and depressive symptomology. This fourth research question addresses the potential effects on a stress outcome (depressive symptomology) of interactions between socio-demographic variables and the focal stressor (school work pressure), as outlined in the stress process model (Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981).

Research Question 4: Net of all relevant controls, do socio-demographic variables (gender, age, SES and living arrangements) moderate the relationship between school work pressure and depressive symptomology in Canada and Finland?

My final set of research questions shifts focus to health risk behaviours associated with depressive symptomology (Brooks, Harris, Thrall & Woods, 2002; Saluja et al., 2004). I examine the relationship between school work pressure, depressive symptomology and substance usage, in particular alcohol use and smoking. Research suggests that adolescent smoking and
drinking behaviours are patterned by socio-demographic factors. My first focus is to evaluate how socio-demographic variables affect substance usage in the two samples.

Research Question 5a: How do socio-demographic variables affect smoking among adolescents in Canada and Finland?

Research Question 5b: How do socio-demographic variables affect alcohol usage among adolescents in Canada and Finland?

Research shows that there is a relationship between school work pressure and substance usage (Kirby et al., 2008), as well as depressive symptomology and substance usage (Hooshmand, Willoughby & Good, 2012; Wolff & Ollendick, 2006). This project will conclude with an exploration of these relationships. It will explore the effect of school work pressure and depressive symptomology on alcohol usage and smoking. I explore whether the relationship between school work pressure and substance usage among adolescents in both Canada and Finland can be explained through depressive symptomology.

Research Question 6a: What are the effects of school work pressure and depressive symptomology on smoking among adolescents in Canada and Finland, net of socio-demographic variables and other correlates?

Research Question 6b: What are the effects of school work pressure and depressive symptomology on alcohol usage among adolescents in Canada and Finland, net of socio-demographic and other correlates?
3.3 Measures

In the following sub-sections, I explain how each of my variables of interest is operationalized for this project. I begin with the socio-demographic variables - sex, age, socioeconomic status and family living arrangements. I then explain my focal independent variable - school work pressure, followed by my focal dependent variable – depressive symptomology. Next, I explain the operationalization of the behavioural variables, smoking and drinking habits. These variables serve as dependent variables for research questions 5 and 6. Finally, I explain how each of the correlates chosen as my controls in my models were operationalized. These other correlates include self-rated health, life satisfaction, academic achievement and school satisfaction.

3.3.1 Socio-demographic variables

Sex is self-reported in the HBSC, as in most other surveys. Participants were asked whether they were male or female. This binary measure is the only measure of gender asked in the HBSC.

The HBSC asks students to report their birthdate. To obtain a continuous age variable the respondents’ age in years is calculated by subtracting the birthdate (using the month and year) from the date the respondent took the survey. This measure is a continuous measure with a range of 10.67-16.42 years old in Canada and 10.83-16.5 years old in the Finnish data.

Socioeconomic status is usually measured through income, education and/or occupational status, or a combination of all three (Currie et al., 2008). However, it is very difficult to measure socioeconomic status in children, because they typically do not have an income and do not have an occupation except for being students. One method sometimes used to determine
socioeconomic status is to ask adolescents about their parents’ income or occupation. However, many adolescents do not have access to this information or are unable to report it accurately (Currie et al., 2008; Schnohr et al., 2008). The HBSC measures socioeconomic status through a family affluence scale that asks participants about family ownership of a telephone, car/vehicle, whether adolescents had their own bedroom, and family holiday times (Currie et al., 2008). This scale has been utilized to represent SES in much of the literature using the HBSC data (Boyce, Torsheim, Currie & Zambon, 2006; Currie et al., 2008; Molcho, Nic Gabhainn & Kelleher, 2007; Schnohr et al., 2008). However, Schnohr and his/her colleagues (2008) suggest that there are cross-country variations on how much each item contributes to the family affluence scale. This results in the scale performing differently depending on the country. They suggest that for cross-country comparisons, it is better to use another measure also available in the HBSC - this measure asks students about their perceived family affluence. The self-perceived family affluence question asks adolescents how well off they think their family is. The response categories are ‘very well off’, ‘quite well off’, ‘average’, ‘not very well off’, ‘not at all well off’. This is the only variable that is used in this project to measure the socioeconomic status of the adolescents. This measure has been used by others using the 2005/2005 version of the HBSC (Saab and Klinger, 2010). I reverse-coded the variable and treat it as a continuous measure ranging from 1 to 5, where 1 indicates ‘not at all well off’ and 5 indicates ‘very well off’.

Family living arrangement is a socio-demographic variable that is used extensively in research on adolescents (Boyce, 2004; Currie et al., 2008; Griesbach et al., 2003; Kerr & Beajot, 2002; Lenciuskine & Zaborskis, 2008; Restifo & Bogels, 2009). The HBSC asks adolescents about family living arrangements by asking participants about who they live with for most of the time: father, mother, stepmother/father’s girlfriend and stepfather/mother’s
boyfriend. Participants responded to these with ‘yes’ or ‘no’ depending on whether they live with the indicated person. As is common practice with research using the HBSC (Griesbach et al., 2003; Boyce, 2006), family living arrangement is usually combined into categories of intact families, lone-parent families, stepfamilies and non-parental families. This project is interested in the effect of specific living conditions and therefore combined all four of the questions and created a composite six category variable. The six categories created represent: living with a biological mother and a biological father; living with a biological father and a stepmother; living with a biological mother and a stepfather; living with a lone mother; living with a lone father; and other/non-parental family (these are individuals who responded no to each of the four questions and include those who live with grandparents or other relatives, in foster care, or in other living arrangements).

3.3.2 Focal independent variable

The focal independent variable of interest for this research is schoolwork pressure. The HBSC survey questions adolescents about many aspects of their school life and environment. The question I use to measure school work pressure is “how pressured do you feel by schoolwork you have to do?” The response categories were ‘not at all’, ‘a little’, ‘some’, and ‘a lot’. The variable was originally coded from 1 through 4. For my research I treat this variable as a continuous variable and use this coding as a scale where an increase in number represents an increase in school work pressure. Although there is a problem in using one measure to operationalize school work pressure that may result in weaker correlations, research using the HBSC commonly uses this measure to represent school work pressure (Karademas et., 2008; Kirby et al., 2008).
3.3.3 Focal dependent variable

The focal dependent variable for research questions 1-4 is depressive symptomology. The HBSC does not use a specific mental health scale to measure depressive symptomology or psychological problems exclusively. Instead, the HBSC uses a set of questions that measures a young person’s subjective health complaints. Research indicates that this checklist known as the HBSC-symptom checklist has high reliability and content validity (Haugland & Wold, 2001). The checklist includes reporting on headache, abdominal pain, backaches, dizziness, feeling low/depressed, irritable/bad temper, nervous and, sleeping difficulties. Some researchers use these measures as a whole and report them in a psycho-somatic scale (Vieno, Santinello, Lenzi, Baldassari & Mirandola, 2009). However, research does indicate that there is a differentiation in these constructed scales between physical illness or other conditions that are triggered by mental factors and those that are exclusively psychological in nature. Kelly, Molcho, Doyle & Gabhainn (2010) indicate that the items in the checklist represent two dimensions. There are four symptoms that constitute somatic symptoms and there are four that constitute psychological symptoms. These symptoms are feeling low, irritable, nervousness and sleeping difficulties. This project is interested in mental health measures that reflect symptomology of depression or feelings associated with depression. Therefore, it will only use the four measures that constitute psychological symptoms from the HBSC checklist. The questions that will be used in my project are as follows.

In the past six months how often have you had the following…?

- Feeling low (depressed)

- Irritability or bad temper
- Feeling nervous

- Difficulties in getting to sleep

These measures were also chosen based on similar depression inventory measures found in the Children’s Depression Inventory (CDI) or the Mood and Anxiety Symptom questionnaire (MASQ) which have been developed through the use of other sources such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) (Boschen & Oei, 2007; Saylor, Finch, Spirito & Bennett, 1984). The categories that participants were allowed to choose from were ‘about every day’, more than once a week’, ‘about every week’, ‘about every month’ or ‘rarely or never’. For each measure, each category was reverse coded and made in a scale from 1-5. An increase in number represents an increase in frequency of having the measure in the past six months.

To improve construct validity a factor analysis was performed in order to create one measure of depressive symptomology. A factor analysis was used in this project in order to create a scale that represents one dimension of depressive symptomology (Acock, 2012; Kim & Mueller, 1978). The items feeling low, irritable, nervous and, sleeping difficulties were combined in this factor analysis. In general, if items load at 0.4 or over on the “depression factor”, then they are considered a good indicator of the factor that is generated (Acock, 2012). There are two main types of analysis when performing a factor analysis, a primary component factor (pcf) or primary factor (pf). This project will use pcf because it is the analysis that is used when you have a set of items that a researcher believes measures one concept. It explains as much of the variance in a set of items as possible with one dimension (Acock, 2012). Each individual will receive a factor score that weights each item based on how related it is to the depressive symptomology construct (Acock, 2012). Ultimately what is produced is a
standardized factor analysis scale with a mean of zero and a variance of 1.0 (Acock, 2012). The scale that is developed in this project is therefore used as a continuous measure. An actual individual “depressive symptomology score” does not necessarily have an intuitive meaning, but this scale does show that a lower number means lower symptomology of depression and high numbers represent higher symptomology of depression. This technique is something that is also done in other depressive symptomology studies as well (Rudolph & Flynn, 2007; Aldwin & Greenberger, 1987; Siddique & D’Arcy, 1984). Rudolph & Flynn (2007) constructed their depressive symptomology scale by using a subscale of 8 items derived from the adolescent’s mood and anxiety symptom questionnaire (Y-MASQ). It is noted that this subscale was derived from the original MASQ and referenced back to the CDI. The factor loadings for each variable for each country are shown in Table 3.1; note that all are over 0.4.

Table 3.1: Factor Loadings of depressed, irritable, nervous and difficulty sleeping in a factor analysis using the Canadian and Finnish Health Behaviour in School Aged Children 2006 Survey.

<table>
<thead>
<tr>
<th></th>
<th>Factor Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Canada</td>
</tr>
<tr>
<td>Depressed</td>
<td>0.7985</td>
</tr>
<tr>
<td>Irritable</td>
<td>0.7777</td>
</tr>
<tr>
<td>Nervous</td>
<td>0.7229</td>
</tr>
<tr>
<td>Difficulty Sleeping</td>
<td>0.703</td>
</tr>
<tr>
<td>Cronbach’s Alpha</td>
<td>0.737</td>
</tr>
<tr>
<td>N</td>
<td>5835</td>
</tr>
</tbody>
</table>

Cronbach’s alpha is a measure of reliability and internal consistency for scales. It measures how correlated all the measures are to one another. It is a coefficient that ranges from a value of 0-1. The higher the score or the closer the alpha gets to 1 the greater the internal
consistency of the scale. Research concludes that an alpha level of 0.7 is an acceptable reliability coefficient (Bland & Altman, 1997; Gliem & Gliem, 2003; Santos, 1999). The Cronbach’s alpha value for my scales in Canada and Finland are 0.737 and 0.7707 respectively. Therefore, I conclude that these are reliable, valid scales.

3.3.4 Secondary Dependent Variables

The secondary dependent variables in this project deal with substance usage and behaviour. The first substance behaviour that will be examined in this project is smoking. Adolescents were asked if they have ever smoked tobacco before in their life (nominal responses ‘yes’ or ‘no’). They were also asked about their frequency of smoking at present. The question asked participants how often they presently smoke tobacco. Possible responses were ‘every day’, ‘at least once a week, but not every day’, ‘less than once a week’ or ‘I do not smoke’. This measure is an ordinal measure but I collapsed the categories and made a dichotomous variable that represents smoking behaviour at present. A score of 0 indicates adolescents that do not smoke at present and a score of 1 indicates that adolescents smoke at present (at any frequency). This is the measure that is used in this project. Further description of this measure is included in appendix A.

The next secondary dependent variable examined in this project is alcohol usage and behaviour. The HBSC asks students ‘how often you drink anything alcoholic?’ They encourage students to think of all times, even when they drink small amounts. The HBSC measures this by asking this question on different types of alcoholic beverages separately. These include beer, wine, liquor/spirits, coolers and others. Participants respond to a categorical frequency scale that asks them how often they drink at present- ‘every day’, ‘every week’, ‘every month’, ‘rarely’ and
‘never’ for each type of alcoholic beverage. I first reverse code each of the alcohol variables and treat each one as an interval ratio variable where an increase in number represents an increase in alcohol usage frequency. I then combined all the alcohol measures and made a dichotomous scale where 0 represents not drinking any type of alcoholic beverage at present and 1 represents drinking any kind of alcoholic beverage at any frequency. Further description of this measure is included in appendix A.

3.3.5 Controls and other Correlates

This section will outline the operationalization and measurement of the controls and correlates to depressive symptomology related to the school environment in adolescents. These controls include: self-rated health; life and school satisfaction; and academic achievement.

Although self-rated health is a subjective indicator of health, it is thought to be a better measure of health among youth and adolescents compared to mortality and morbidity rates (Burstreoem & Fredlund, 2001 Currie et al., 2008; Ilder & Benyamani, 1997). Research indicates that self-rated health is associated with depressive symptomology and anxiety (de Matos, Barrett, Dadds & Short, 2003). The HBSC asks about their self-rated health by asking “would you say your health is….?” The responses that participants could choose from were ‘excellent’, ‘good’, ‘fair’ or ‘poor’. In this project I kept the original codes ascribed by HBSC researchers and reverse coded the categories from 1-4. This project therefore treats this measure as a continuous variable where a score of ‘1’ indicates poor health and an increase in number relates to an increase in self-rated health.

Life-satisfaction is an important part of an individual’s well-being. Life-satisfaction is associated with depressive symptomology, substance usage and positive school experiences.
(Diener & Diener, 1995; Proctor et al., 2009; Zullig et al., 2001). In the HBSC, students were asked to respond to how satisfied they felt with their life by using a technique called the Cantril ladder (Cantril, 1965). The ladder is indicated with numbers 0-10. A zero indicates a worst possible life, while a ten indicates a best possible life. This measure therefore is a continuous measure where an increase in “step number” signifies an increase in life satisfaction.

Research shows that positive experiences and school satisfaction are related to mental and physical health in adolescents (Samdal et al., 1998). Adolescents who dislike school are also at risk of developing unhealthy habits such as smoking and drinking (Rasmussen et al., 2005; Samdal et al., 1998). This project will use a measure that asks participants how they felt about school at the time they took the survey. The choices were ‘I like it a lot’, ‘I like it a bit’, ‘I don’t like it very much’ and ‘I don’t like it at all’. This ordinal measure was reverse coded and a continuous school satisfaction scale from 1-4 was created, where 1 indicates not liking school at all and an increase in number relates to an increase in school satisfaction.

Academic achievement is another measure that is associated with health and well-being (Suldo, Riley & Shaffer, 2006) and health risk behaviours such as smoking and drinking (Bryant et al., 2003). The HBSC asks students about student’s perceived school performance rather than direct/ objective school performance because research indicates that perceived school performance is a stronger predictor of well-being than objective academic achievement (Currie et al., 2008). They measure this by asking students what they thought their teachers thought about their school performance compared to other students. The possible categories students could respond to were ‘very good’, ‘good’, ‘average’ or ‘below average’. In this study the categories were reverse coded and the measure was treated as a continuous variable with a range from 1-4, where an increase in number indicates an increase in perceived academic achievement.
3.4 Statistical Methodology

First, I ran descriptive statistics on all the variables in question. These statistics include percent distributions, means and ranges where appropriate. Chi square statistics were also performed for each variable by country in order to see if there was any statistical difference between Canada and Finland for each variable.

The second part of this project looks at explaining depressive symptomology. Before all variables were put in models, I performed bivariate regression of each of my variables with depressive symptomology in both countries in order to get a better understanding how each of the variables were related with depressive symptomology. The aim of the first research question (How do socio-demographic variables affect depressive symptomology in school-aged adolescents in Canada and Finland?) is to gain a better understanding of the social forces that influence symptoms of depression in both populations. The variable that measures depressive symptomology is a continuous variable and therefore multivariate linear regression OLS was performed (Pohlman & Leitner, 2003). For each subsequent research question, multivariate regression was performed in a step-wise manner to evaluate the additive effects of school work pressure on depressive symptomology (research question 2) and the effect of school work pressure with all controls (research question 3). Comparisons between each country were observed by evaluating the statistical significance of relationships, paying particular attention to effects that differed between countries. Also, to compare the models between each country, the explained variance ($r^2$) for each model was compared.

In order to assess research question four, (Net of relevant controls, do socio-demographic variables (gender, age, SES) moderate the relationship between school work pressure and
I ran multivariate regression with interaction terms. The first step was to establish whether each sociodemographic variable had an overall effect on feelings of being depressed. If no relationship existed, then an interaction term was not generated as there was no original effect. If an original effect was present, in order to test for moderation, a multiplicative term between school work pressure and each socio-demographic variable was generated. In order to avoid issues of multicollinearity and for better interpretation, all continuous variables were mean centered and then each term was multiplied together. This multiplicative term was then added to the last model (model 4) in order to see if there was an added differential effect on feelings of being depressed. After each model was evaluated, variance inflation factors (VIFs) were examined to determine whether variance is increased because of issues of multicollinearity. If a VIF exceeds a value of 10 then multicollinearity is an issue that needs to be addressed (Acock, 2012). It is noted that no VIFs in any of the models exceeded this threshold.

The second portion of this project focuses on substance usage, smoking and alcohol usage. It follows a similar statistical analysis as the first portion. The first set of research questions (How do socio-demographic variables affect smoking in school-aged adolescents in Canada and Finland; How do socio-demographic variables affect alcohol usage in school-aged adolescents in Canada and Finland?) endeavours to address the fact that different sociodemographic variables may affect the usage of smoking and alcohol usage differently. The second set of research questions attempts to explore the relationship between school work pressure, depressive symptomology and substance use (What is the effect of school work pressure and depressive symptomology on smoking and drinking alcohol among adolescents in Canada and Finland, net of socio-demographic variables and other correlates?). Since both the
smoking and alcohol usage variables are dichotomous variables, logistic regression is performed to evaluate these effects. Therefore, the second part of my results evaluates the association between the independent variables and the likelihood of smoking versus not smoking and of drinking versus not drinking at present (Pohlman & Leitner, 2003).
Chapter 4: Results

4.1 Descriptive Table

Table 4.1 shows a summary of the distribution of all the variables that are part of this project. These include: the focal independent variable, school work pressure; the focal dependent variable, depressive symptomology; the secondary dependent variables, smoking and alcohol usage; socio-demographic variables, sex, social class, age and family arrangement; and control variables, self-rated health, life satisfaction, academic achievement and school satisfaction. Since most of the variables in question are ordinal variables, proportions for each category are provided for each of the variables in both countries. In the multivariate models, all ordinal variables are treated as continuous variables. Therefore, means and standard deviations for each variable are also provided. For composite variables that were constructed and for variables that are already continuous, means and standard deviations are provided. These data were produced separately for the Finnish and Canadian samples and tests of statistical differences were performed in order to determine whether the distribution of each variable differed by country.

Table 4.1: Descriptive statistics from the Canadian and Finnish Health Behaviour in School Aged Children 2006 Survey

<table>
<thead>
<tr>
<th></th>
<th>Valid % or Mean (Std. error)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Canada</td>
</tr>
<tr>
<td><strong>Focal Independent Variable</strong></td>
<td></td>
</tr>
<tr>
<td>School Work Pressure*</td>
<td></td>
</tr>
<tr>
<td>Not at all (1)</td>
<td>15.66</td>
</tr>
<tr>
<td>A little (2)</td>
<td>40.44</td>
</tr>
<tr>
<td>Some (3)</td>
<td>29.13</td>
</tr>
<tr>
<td>A lot (4)</td>
<td>14.76</td>
</tr>
<tr>
<td>(Mean)</td>
<td>2.42</td>
</tr>
<tr>
<td><strong>Focal Dependent Variable</strong></td>
<td></td>
</tr>
<tr>
<td>Depressive Symptom (score)*</td>
<td>-0.0067 (0.014)</td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>1.447</td>
</tr>
<tr>
<td><strong>Secondary dependent Variables</strong></td>
<td></td>
</tr>
</tbody>
</table>
### Smoking

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not smoke</td>
<td>90.08</td>
<td>86.12</td>
</tr>
<tr>
<td>Smoke</td>
<td>9.92</td>
<td>13.88</td>
</tr>
</tbody>
</table>

### Alcohol

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Do not drink</td>
<td>44.02</td>
<td>54.98</td>
</tr>
<tr>
<td>Drink</td>
<td>55.98</td>
<td>45.02</td>
</tr>
</tbody>
</table>

### Sociodemographic variables

#### Sex

<p>| | |</p>
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>47.37</td>
</tr>
<tr>
<td>Female</td>
<td>52.63</td>
</tr>
</tbody>
</table>

#### SES indicator

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>(Mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all well off</td>
<td>2.71</td>
<td>0.27</td>
<td></td>
<td></td>
<td></td>
<td>0.27</td>
</tr>
<tr>
<td>Not very well off</td>
<td>5.71</td>
<td>2.98</td>
<td></td>
<td></td>
<td></td>
<td>2.98</td>
</tr>
<tr>
<td>Average</td>
<td>31.82</td>
<td>22.78</td>
<td></td>
<td></td>
<td></td>
<td>22.78</td>
</tr>
<tr>
<td>Quite well off</td>
<td>35.79</td>
<td>36.65</td>
<td></td>
<td></td>
<td></td>
<td>36.65</td>
</tr>
<tr>
<td>Very well off</td>
<td>23.97</td>
<td>37.33</td>
<td></td>
<td></td>
<td></td>
<td>37.33</td>
</tr>
<tr>
<td>(Mean)</td>
<td>3.73</td>
<td>4.08</td>
<td></td>
<td></td>
<td></td>
<td>3.96</td>
</tr>
</tbody>
</table>

#### Age

<table>
<thead>
<tr>
<th>Age</th>
<th>13.84 (0.020)</th>
<th>13.75 (0.023)</th>
</tr>
</thead>
</table>

### Family Living Arrangement

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Both biological</td>
<td>67.03</td>
<td>70.11</td>
</tr>
<tr>
<td>Lone mother</td>
<td>14.25</td>
<td>13.35</td>
</tr>
<tr>
<td>Lone father</td>
<td>3.14</td>
<td>2.15</td>
</tr>
<tr>
<td>Mother &amp; stepfather / bf</td>
<td>7.89</td>
<td>9.81</td>
</tr>
<tr>
<td>Father &amp; stepmother / gf</td>
<td>1.72</td>
<td>1.43</td>
</tr>
<tr>
<td>Other</td>
<td>5.97</td>
<td>3.14</td>
</tr>
</tbody>
</table>

### Other Correlates

#### Self-rated health

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>1.71</td>
<td>0.53</td>
</tr>
<tr>
<td>Fair</td>
<td>13.44</td>
<td>10.03</td>
</tr>
<tr>
<td>Good</td>
<td>54.19</td>
<td>63.11</td>
</tr>
<tr>
<td>Excellent</td>
<td>30.66</td>
<td>26.33</td>
</tr>
<tr>
<td>(Mean)</td>
<td>3.13</td>
<td>3.15</td>
</tr>
</tbody>
</table>

#### Life Satisfaction

<table>
<thead>
<tr>
<th>Life Satisfaction</th>
<th>7.42 (0.024)</th>
<th>7.94 (0.022)</th>
</tr>
</thead>
</table>

#### Academic achievement

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Below Average</td>
<td>4.42</td>
<td>4.42</td>
</tr>
<tr>
<td>Average</td>
<td>25.89</td>
<td>33.16</td>
</tr>
<tr>
<td>Good</td>
<td>45.98</td>
<td>46.1</td>
</tr>
<tr>
<td>Very good</td>
<td>23.7</td>
<td>16.32</td>
</tr>
<tr>
<td>(Mean)</td>
<td>2.89</td>
<td>2.74</td>
</tr>
</tbody>
</table>

#### Like School

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t like it at all</td>
<td>7.03</td>
<td>8.45</td>
</tr>
<tr>
<td>Don’t like it very much</td>
<td>15.07</td>
<td>24.17</td>
</tr>
<tr>
<td>Like it a bit (3)</td>
<td>48.46</td>
<td>51.24</td>
</tr>
<tr>
<td>Like it a lot (4)</td>
<td>29.44</td>
<td>16.13</td>
</tr>
<tr>
<td><strong>(Mean)</strong></td>
<td>3.00</td>
<td>2.75</td>
</tr>
</tbody>
</table>

*Indicates statistical difference by country. Tested through a Chi² test or a t-test.

a. Depressive symptomology is based on a scale created through factor analysis, which includes feelings of being depressed, irritated, nervous and sleeping difficulties.

b. Smoking behaviour at present.

c. Dichotomous composite measure of drinking any kind of alcohol at present. Beverages include: beer, wine, spirits, alcopops and other alcoholic beverages.

d. SES indicator measured by self-perceived family economic well-being.

e. Life satisfaction measured using a scale from 1-10.

### 4.1.1 Focal Independent Variable: School Work Pressure

Students in the Canadian sample report a higher percentage of feeling ‘a lot’ of school work pressure compared to Finnish students. 14.76% of Canadian adolescents report that they feel ‘a lot’ of school work pressure, while only 8.97% of Finnish adolescents fall in this category. In both samples it is evident that most adolescents fall in the middle categories of feeling ‘a little’ school work pressure and ‘some’ school work pressure. In the Canadian case, these categories represent 40.44% and 29.13% of the sample, and in the Finnish case they represent 51.17% and 29.85% of the sample respectively. Fewer adolescents in Finland report having no school work pressure at all, as only 10% fall into this category while 15.66% of adolescents in the Canadian sample fall in this category. The distribution of school work pressure between the two samples is statistically different at an alpha level of less than 0.001. As mentioned previously, all ordinal variables will be treated as continuous variables in the multivariate models. School work pressure was recoded as a continuous variable from 1 – 4 with an increase in number representing an increase in school work pressure. The Canadian sample has a slightly higher mean (2.42) on the continuous variable than the Finnish sample (2.38). This difference, although slight, is statistically significant at an alpha level of less than 0.01.
4.1.2 Focal dependent Variable: Depressive symptomology

As mentioned in the previous chapter, a factor analysis was conducted separately in each country to produce a country-specific scale to examine depressive symptomology. The standardized depression scores, which represent depressive symptomology, have a mean of zero. Interquartile ranges can therefore provide a comparison of the distribution in each sample. In the Canadian sample, this range between the lower and upper quartile is from -0.674 - 0.773 (a range of 1.447 points) and in the Finnish sample it is -0.545 - 0.770 (a range of 1.315 points). There is a wider interquartile range of depressive symptomology scores in Canada. With regards to lower quartile it is seen that on average Canadian adolescents have a lower depressive symptomology score therefore having lower depressive symptomology, whereas in the upper quartile the Finnish sample has a slightly higher depressive symptomology score than the Canadian sample therefore representing slightly higher depressive symptomology.

4.1.3 Secondary Dependent Variables: Smoking & Alcohol Usage

The distribution of smoking behaviours at present shows that in both countries most adolescents in the sample do not smoke with 90.08% and 86.12% of adolescents responding that they don’t smoke in Canada and Finland respectively at present. This difference is statistically significant at an alpha level of less than 0.001. This means that adolescents that live in Canada report that they do not smoke at present more than adolescents that live in Finland.

Examining substance usage, alcohol is used more frequently than cigarettes in both countries. Currently not drinking alcohol is the most frequently reported category in both countries, representing 44.02% of adolescents in the Canadian sample and 54.98% in the Finnish
sample. More Finnish adolescents report not drinking alcohol at present than Canadian adolescents. This difference observed is statistically significant at p < 0.001.

4.1.4 Socio-demographic Variables: Sex, Social Status, Age & Family Living Arrangement

The sex distribution is almost identical between the two samples. There is no statistical difference in reported sex of participants between the two country samples. The proportion of adolescents that are boys in both samples is about 47% and the proportion of girls in both samples is about 52%.

As mentioned earlier, the social status measure used is a self-reported indicator of how well off adolescents think their family is. Both country samples have small proportions of adolescents that report their family is ‘not at all well off’. However, the proportion of adolescents that report being ‘not at all well off’ in the Canadian sample is 10 times larger than the Finnish sample (2.71% vs. 0.27%). In the case of the Finnish sample, the proportion increases as family “well off-ness” increases. This is also the case with the Canadian sample except the proportion decreases in the last category “very well off”. The proportion of adolescents that report being very well off in Finland is higher (37.33%) than the proportion of adolescents in the Canadian sample that report the same (23.97%). The distribution of this variable between the two countries is statistically different; Finnish adolescents feel that they are better off. The reported mean in the Finnish sample is 4.08, significantly higher than the mean of the Canadian sample of 3.73.

The mean age of the two samples is slightly different. The average age of adolescents in the Canadian sample is 13.84 (SD= 1.53 years) years old and in Finland is 13.75 (SD = 1.66 years) years old. This difference is statistically different.
The final socio-demographic variable is family living arrangement. More than half of individuals in both countries report that they live with both biological parents. In the Canadian sample the proportion of adolescents that report living with both parents is 67.03% and in the Finnish sample this represents 70.11% of the adolescents. This also shows that the proportion of adolescents that live with both biological parents is slightly higher in Finland. The next biggest category for both samples is living with just a mother. This represents 14.25% and 13.35% of the samples in Canada and Finland respectively. The third largest category for both countries is children who live with a biological mother and a stepfather. Adolescents in the Finnish sample report living in these arrangements more compared to the adolescents in the Canadian sample (9.81% vs. 7.89%). In both countries the fourth largest group is adolescents that live in other living arrangements. The details of this category are not quantified but this could mean adolescents that live with grandparents or other relatives, adopted parents or foster care. 5.97% of adolescents in the Canadian sample and 3.14% of Finnish adolescents report living in these conditions. The smallest categories for both countries are the categories where adolescents live with just a biological father or a biological father and a stepmother. Children that live with a father and stepmother represent the smallest category. The proportion of individuals in the Canadian sample that live in these conditions is 1.72% and in Finland it is 1.43%. The difference in family arrangement distribution between the two countries is significantly different. This indicates that Finnish adolescents are more likely to report that they live with biological parents as compared to Canadian adolescents.

4.1.5 Controls and Other Correlates

In terms of self-rated health, adolescents reporting poor health are the smallest proportion in both countries with 1.71% of adolescents in the Canadian sample and 0.53% of Finnish
adolescents identifying themselves in this category. Canadian adolescents are more likely to report that they have poor health than Finnish adolescents. Most adolescents report having good health, with 54.19% of Canadian adolescents in this category and 63.11% of Finnish adolescents. In both countries there is a decrease in the proportion who report excellent health compared to good health. The proportion of Canadian adolescents who reported having excellent health was 30.66%, while the proportion of Finnish adolescents who reported to have excellent health was 26.33% The difference in the distribution of self-rated health between the two countries is statistically significant. However, a t-test (p=0.2418) of the difference between the means indicates that there is no difference between the means on self-rated health for the two samples. This means that in general Canadians and Finnish adolescents rate their health similarly.

As mentioned earlier, life satisfaction is a continuous variable with a possible range of 0-10. An increase in number indicates an increase in life satisfaction. The means in both countries are very similar. Adolescents in the Finnish sample report a mean life satisfaction of 7.94 (SD=1.56); this is compared to a mean of 7.42 (SD=1.82) in the Canadian sample. Therefore, adolescents in the Finnish sample report slightly higher levels of life satisfaction, on average, than adolescents in the Canadian sample. This difference in means is statistically significant at p < 0.001.

Adolescents’ perception of school achievement shows that adolescents in both countries perceive they have poor academic achievement the least. This represents 4.42% of the sample in both countries. Most students in both the Canadian and Finnish samples perceive in having good achievement compared to others with proportions of 45.98% and 46.10% respectively. Canadian adolescents respond to higher perceived academic achievement compared to others than adolescents in the Finnish sample. Twenty-three point seventy percent of adolescents in the
Canadian sample perceive having very good achievement compared to others while only 16.32% of adolescents in the Finnish sample report the same. A chi value of 122.78 (p<0.001) indicates that the differences in the distribution are significantly different. A t-test value of 9.64 (p<0.001) also indicates that the means in both samples are statistically different, with Canadian adolescents having a slightly higher mean (2.89) compared to the mean of Finnish adolescents (2.74). This indicates that in general, Canadian adolescents perceive their academic achievement is higher than Finnish adolescents.

The variable used to measure school satisfaction is a variable that asks students how much they like school. In both countries, most students answer “I like school a bit”. 48.46% percent of Canadian adolescents in the sample picked this response and 51.24% of Finnish adolescents picked this response. Not liking school at all was the least chosen category in both countries. There are differences however in the category “I don’t like school very much.” Finnish adolescents chose this response more than Canadian adolescents (24.17% vs. 15.07%). There is also a difference in the category “I like school a lot”; Canadian adolescents chose this response more than Finnish adolescents (29.44% vs. 16.13%). The distribution indicates that Finnish adolescents like school less than Canadian adolescents, and this difference in distribution is significant. Adolescents in the Canadian sample report a slightly higher mean (3.00) on the liking school variable than adolescents in the Finnish sample (2.75). This difference between means is also statistically significant at p<0.001.

4.1.6 Correlation Matrices

This next section will present an overview of the correlation matrices in each individual country. It is important to look at how each of the interval-ratio variables are correlated with
each other in order to determine whether there will be issues of multicollinearity when multivariate analysis is done (Acock, 2012). Table 4.2 presents the correlation matrix for Canada. It is evident that all the variables are significantly associated with each other. Similarly, table 4.3 shows the similar case in the Finnish context. Although, the variables are correlated they are not necessarily strong enough to be considered an issue when running multivariate regression. However, variance inflation factors will be evaluated in order to ensure that multicollinearity is not an issue (Acock, 2012).

Table 4.2 Correlation Matrix of Variables from the Canadian Health Behaviour in School Aged Children 2006 Survey.

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<thead>
<tr>
<th></th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
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</tr>
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<td>0.28***</td>
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</table>

*** p<0.001
1. Depressive symptomology
2. School work pressure
3. Age
4. Family well off
5. Health
6. Life satisfaction
7. Academic achievement
8. School satisfaction
Table 4.3 Correlation Matrix of Variables from the Finnish Health Behaviour in School Aged Children 2006 Survey.

<table>
<thead>
<tr>
<th></th>
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<td>0.28***</td>
<td>0.35***</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*** p<0.001

1. Depressive symptomology
2. School work pressure
3. Age
4. Family well off
5. Health
6. Life satisfaction
7. Academic achievement
8. School satisfaction

4.2 Regression Results

This section will present an overview of the results of the regression models that are presented in tables 4.4, 4.5 and 4.6. Table 4.4 presents the ordinary least squares regression results that correspond to the first four research questions outlined in section 3.2 above (Table B2 in appendix B presents the standardized results). Each model represents a progression of the research questions. Model 1 explores the effects of socio-demographic variables on depressive symptomology. Model 2 explores the additive effect of school work pressure on depressive symptomology. Model 3 adds other controls and correlates. The final model examines the moderating effect of socio-demographic variables on the relationship between school work pressure and feelings of depressive symptomology. If the original effect between a socio-demographic variable had an insignificant effect on depressive symptomology or if the
multiplicative term was insignificant it was not added into the table. Therefore, the only moderation effect present in the model is the moderation effect of sex, which was significant. Figures are provided to illustrate the effect of the interaction of sex and school work pressure on depressive symptomology in each country. Each model is performed separately for Canada and Finland.

Tables 4.5 and 4.6 present findings that correspond to the exploration of substance usage; research questions 5 and 6 as outlined in section 3.2 above. Table 4.5 investigates smoking behaviour among adolescents at present. The first model in this table looks at the effect of socio-demographic variables on whether adolescents smoke or not at present. The second model explores the effect of school work pressure on smoking when controlling for socio-demographics and other correlates. The third model examines the effect of depressive symptomology on smoking behaviour at present. The final model puts depressive symptomology and school work pressure in the same model to explore the interaction between the two on smoking behaviour. Table 4.6 is a replication of 4.5 except it explores the effects of all the same variables on alcohol usage at present. All models in both tables are run separately by country.

4.2.1 Regression Results: The Effects on Depressive Symptomology

The Canadian results in “model 1” in table 4.5 show that all of the socio-demographic variables have an effect on depressive symptomology in Canadian adolescents. With regards to perceived social status, the unstandardized coefficient is -0.186, and is significant at p<0.001. This indicates that as an adolescent’s perceived family status increases by one unit then their predicted score on the depressive symptomology scale decreases by 0.186 units, controlling for age, sex, and family arrangement. The coefficient for age is 0.060 and is significant at a p<0.001.
This means that as a Canadian adolescent’s age increases by one year then their depressive symptomology score is predicted to increase by 0.060 units, controlling for perceived social status, sex and family arrangement. The coefficient for sex is 0.233, significant at a p<0.001. On average, females score 0.233 units higher than boys (the reference group) on the depressive symptomology scale, controlling for perceived social status, age and family arrangement. The reference group for the family arrangement variable is living with both biological parents. A significant (p<0.001) lone mother coefficient of 0.152 means that on average adolescents who live with just their mother are predicted to have a score of 0.152 units higher on the depressive symptomology scale than adolescents that live with both biological parents, controlling for perceived social status, age and sex. Similar relationships are observed with adolescents that live with a mother and a stepfather and adolescents that live in other living arrangements without either parent. On average, adolescents that live with a mother and a stepfather are predicted to have a score of 0.236 units higher on the depressive symptomology scale (p<0.001) than those who live with both biological parents, and adolescents that live in ‘other’ family arrangements (living with other relatives, foster care, somewhere else, etc.) are predicted to have a depressive symptomology score that is 0.190 units higher (p<0.05 ) on the depressive symptomology scale than adolescents who live with both biological parents, controlling for age, sex, and perceived social status. There is no significant difference in the depressive symptomology scale scores of adolescents who live with just a father or with a father and stepmother and those adolescents who live in a family with both biological parents, controlling for age, perceived social status, and sex. The amount of variance in depressive symptomology that is explained in this first model using only socio-demographic variables is about 7%. 
The Finnish results for “model 1” in table 4.4 show similar trends to the Canadian results. Perceived social status affects the depressive symptomology scores among the Finnish population almost the exact same way as adolescents in Canada. An increase in social status results in a predicted decrease on the depressive symptomology scale by 0.189 units, controlling for age, sex and family arrangement (p<0.001). Controlling for other socio-demographic variables, an increase in one year of age among Finnish adolescents results in a predicted increase on the depressive symptomology scale of 0.062 units, significant at a p<0.001. On average, females are also predicted to have a score on the depressive symptomology scale higher than boys by 0.253 units (p<0.001), controlling for perceived social status, age and family arrangement. In Finland, the only family arrangement category that has an effect compared to adolescents living with both biological parents are adolescents that live in ‘other’ arrangements. The coefficient for this category is 0.294, significant at p<0.001. This means that Finnish adolescents that live in ‘other’ living arrangements have a predicted depressive symptomology score that is 0.294 units higher than Finnish adolescents that live with both biological parents, controlling for perceived social status, age and sex. It is also noted that the amount variance in depressive symptomology that is explained is about 7%.

The results of “Model 2” in the Canadian data show that when controlling for all the socio-demographic variables, the effect of school work pressure on the depressive symptomology scale is significant at an alpha level less than 0.001. A coefficient of 0.295 indicates that as school work pressure increases by one unit, the score on the depressive symptomology scale is predicted to increase by 0.295 units, controlling for socio-demographic variables. The effects of all of the socio-demographic variables remain the same when school work pressure is added to the model. Adding school work pressure to the model increases the explained variance in depressive
Table 4.4: The effects of socio-demographic variables and school work pressure on depressive symptomology. OLS regression results from the Health Behaviour in School Aged Children 2006 Survey, Canada and Finland\textsuperscript{ab}.

<table>
<thead>
<tr>
<th></th>
<th>Model 1 Canada</th>
<th>Model 1 Finland</th>
<th>Model 2 Canada</th>
<th>Model 2 Finland</th>
<th>Model 3 Canada</th>
<th>Model 3 Finland</th>
<th>Model 4 Canada</th>
<th>Model 4 Finland</th>
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<td>Perceived Social Status</td>
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<td>-0.055***</td>
<td>0.004</td>
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<td>Age</td>
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<td>0.062***</td>
<td>0.028***</td>
<td>0.034***</td>
<td>0.011</td>
<td>0.013</td>
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<tr>
<td>Female\textsuperscript{c}</td>
<td>0.233***</td>
<td>0.253***</td>
<td>0.218***</td>
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<td>0.213***</td>
<td>0.231***</td>
<td>0.213***</td>
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<tr>
<td>lone mother</td>
<td>0.152***</td>
<td>0.076</td>
<td>0.153***</td>
<td>0.047</td>
<td>0.039</td>
<td>0.019</td>
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<td>lone father</td>
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<td>0.082</td>
<td>0.102</td>
<td>0.0003</td>
<td>0.009</td>
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<td>mother + stepfather</td>
<td>0.236***</td>
<td>0.057</td>
<td>0.253***</td>
<td>0.115</td>
<td>0.116**</td>
<td>0.224*</td>
<td>0.116**</td>
<td>0.226**</td>
</tr>
<tr>
<td>father + stepmother</td>
<td>0.178</td>
<td>0.022</td>
<td>0.167</td>
<td>0.027</td>
<td>0.074</td>
<td>-0.048</td>
<td>0.071</td>
<td>-0.043</td>
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<tr>
<td>other</td>
<td>0.190**</td>
<td>0.294***</td>
<td>0.176**</td>
<td>0.226**</td>
<td>0.074</td>
<td>0.057</td>
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<td>0.191***</td>
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<td>-0.136***</td>
<td>-0.251***</td>
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<td>-0.190***</td>
<td>-0.172***</td>
<td>-0.188***</td>
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<td>-0.102**</td>
<td>-0.054**</td>
<td>-0.102***</td>
<td>-0.053**</td>
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<td>-0.102***</td>
<td>-0.054**</td>
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<td>-0.053**</td>
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<td>-0.022</td>
<td>0.091**</td>
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</table>

| **N**                 | 5524           | 5082            | 5491          | 5009            | 5358           | 4749            | 5358           | 4749            |
| **r²**                | 0.0702         | 0.0669          | 0.1420        | 0.1655          | 0.2770         | 0.2967          | 0.2771         | 0.2979          |

Notes:
- a. p<0.05*, p<0.01**, p<0.001***
- b. Unstandardized coefficients shown.
- c. Reference group=male
- d. Reference group=living with both biological parents
symptomology by almost double. 14.2% of the variance in depressive symptomology is explained when adding school work pressure to the model.

The Finnish results in “Model 2” also show similar trends. When adding school work pressure, all the socio-demographic variables remain significant and the effects remain the same. Also, school work pressure has a significant effect on a score on depressive symptomology scale. A coefficient of 0.408 (p<0.001) indicates that an increase in one unit of school work pressure results in a predicted 0.408 unit increase on the depressive symptomology scale, controlling for socio-demographic variables. Sixteen point fifty-five percent of the variance in depressive symptomology in Finland is explained by “model 2”.

“Model 3” represents the full model predicting scores on the depressive symptomology scale when self-rated health, life satisfaction, academic achievement and school satisfaction are added as controls. In Canada, school work pressure continues to have a positive significant effect (p<0.001) on the depressive symptomology scale controlling for socio-demographic variables, self-rated health, life satisfaction, academic achievement and school satisfaction. The effects of the socio-demographic variables on depressive symptomology change slightly in the complete model. Once we control for self-rated health, life satisfaction, academic achievement and school satisfaction, age no longer has a significant effect on the depressive symptomology scale. Also, in terms of the family living arrangement variable, the only effect that remains is that adolescents who live with a mother and stepfather score higher on the depressive symptomology compared to adolescents who live with both biological parents. A coefficient of 0.116, significant at p<0.01, indicates that on average adolescents that live with a mother and a stepfather have a predicted score on the depressive symptomology scale of 0.116 units higher than adolescents that live with both biological parents, controlling for perceived social class, age, sex, school work pressure,
self-rated health, life satisfaction, academic achievement and school satisfaction. In Canada, perceived social status and gender continue to have significant effects on depressive symptomology (p<0.001), net of all other variables. A quick look at the effect of other correlates on the depressive symptomology scale shows that self-rated health, life satisfaction and school satisfaction all have significant (p<0.001) negative effects on the score on depressive symptomology. This means that as each measure increases by its respective units, the predicted score on the depressive symptomology scale decreases by their respective coefficients, controlling for all other variables. In Canada, academic achievement has no effect on the score on depressive symptomology controlling for socio-demographic variables, school work pressure and other correlates, as the p value of for the academic achievement coefficient in Model 3 is greater than 0.05. The explained variance in depressive symptomology increases again in “model 3”. This model explains 27.7% of the variance in depressive symptomology in Canada.

In Finland (“model 3”), the effect of school work pressure continues to have a significant positive effect (p<0.001) on the depressive symptomology score, controlling for socio-demographic variables, self-rated health, life satisfaction, academic achievement and school satisfaction. The effects of socio-demographic variables also change in Finland. Similar to the Canadian results, age no longer has a significant effect on the depressive symptomology score in Finland, controlling for family arrangement, perceived social status, sex, school work pressure, self-rated health, life satisfaction, academic achievement and school satisfaction. Also, sex and living with a mother and step-father continue to have significant effects on depressive symptomology, with girls having a predicted score on the depressive symptomology scale higher than boys, net of all controls. On average, adolescents living with a mother and step-father have a higher predicted depressive symptomology score than adolescents that live with both biological
parents, controlling for all other variables in the model. Perceived social status no longer has a significant effect on depressive symptomology, controlling for all variables in the model. All other correlates (self-rated health, life satisfaction, and school satisfaction) have a significant negative effect on depressive symptomology in Finland, controlling for every other variable in the model. Academic achievement is also significant in the Finnish case (p<0.01**). A one unit increase in academic achievement results in a predicted decrease on the depressive symptomology scale of 0.054 units, controlling for every other variable in the model. The overall explained variance in the score on depressive symptomology for the Finnish model is 29.67%.

The fourth model adds the interaction effects of socio-demographic variables and school work pressure. Multiplicative terms were created and tested for all significant socio-demographic variables\(^1\). However, only the multiplicative term between sex and school work pressure is shown in the table because it is the only one that is significant for either Canada or Finland. In the Canadian case, once the interaction between sex and school work pressure is included in the model, the coefficient for school work pressure continues to be positive (p<0.00). As school work pressure increases, the score on depressive symptomology is predicted to increase by 0.191 units, controlling for socio-demographic variables, other correlates, and the interaction term. Likewise, the gender coefficient is also significant (p<0.00). A positive sex coefficient indicates that girls have a predicted depressive symptomology score higher than boys by 0.213 units, controlling for other socio-demographic variables, school work pressure, other correlates and the interaction term. The interaction term between school work pressure and gender is insignificant.

\(^1\) To avoid multicollinearity, I mean centered school work pressure, SES and, age variables before multiplying the socio-demographic variables together with school work pressure (Acock, 2012). The coefficients all still have the same relative meaning. This was done to avoid issues of strong correlations between these variables and the multiplicative terms. The VIFs confirm that I addressed the issue of multicollinearity as they were lower than the commonly accepted threshold of 10 (Acock, 2012).
in Canada. This means that the effect of school work pressure on depressive symptomology is the same for boys and girls in Canada, controlling for other socio-demographic variables, school work pressure and other correlates.

The Finnish results show that the previous effects of variables in “model 3” and “model 4” remain the same. The effects of school work pressure and sex on depressive symptomology are similar to the Canadian results. As school work pressure increases, the score on depressive symptomology is predicted to increase by 0.207 units, controlling for socio-demographic variables, other correlates, and the interaction term. A positive sex coefficient indicates that girls have a predicted depressive symptomology score higher than boys by 0.232 units, controlling for other socio-demographic variables, school work pressure, other correlates and the interaction term. The coefficient of the multiplicative term (school work pressure X female) is 0.091 and it is significant at a p<0.01. This means that the effects of school work pressure on depressive symptomology differ between boys and girls in such a way that on average school work pressure has a stronger effect on the depressive symptomology scale for girls than for boys. The predicted added effect of school work pressure on this score for girls in Finland is 0.091 units, controlling for every other variable in the model.

Figures 4.1 and 4.2 emphasise the differences between the effect of school work pressure on depressive symptomology for boys and girls in each country. The figures use the adjusted predicted means for low and high school work pressure for boys and girls. Figure 4.1 represents

---

2 The adjusted predicted means were calculated by using the adjust command in STATA (Acock, 2012). This command allows us to calculate a predicted mean of depressive symptomology at low scores of school work pressure (school work pressure score at the 10th percentile) and high scores of school work pressure (school work pressure score at the 90th percentile). Four predicted means were calculated indicating depressive symptomology scores for boys at low and high scores of school work pressure and depressive symptomology scores for girls at low and high scores of school work pressure. I also entered all the other variables in the model in order to hold all these variables constant at their respective means (Acock, 2012).
the Canadian model and it shows that girls have higher depressive symptomology scores than boys at both low school work pressure and high school work pressure. What is also emphasized from the results in “model 4” is that the slopes for both girls and boys are positive. This shows that as school work pressure increases, depressive symptomology increases for both boys and girls. The slopes are also parallel, or identical to each other. This indicates that the effect of school work pressure on depressive symptomology does not differ between boys and girls. This is exemplified with the non-significant multiplicative term (school work press X female) in “model 4”.

Figure 4.2 represents the Finnish interaction in “model 4”. Again, we see similar results to the Canadian case. The male and female slopes are positive indicating a positive relationship between school work pressure and depressive symptomology for both boys and girls. Also, it is seen that girls have a higher score than boys at low and high levels of school work pressure. However, what is different between the Canadian and Finnish case and is also indicated in “model 4” is that the slope for females is steeper than the slope for males (the lines are not parallel). This shows that the effect of school work pressure on the depressive symptomology is stronger for girls than for boys in Finland. This is exemplified with a significant positive multiplicative coefficient term (school work pressure X female) in Finland.
Figure 4.1: Sex differences in School Work Pressure and depressive symptomology score in Canada, controlling for social class, age, family living arrangement, self-rated health, life satisfaction, academic achievement and school satisfaction, from the Health Behaviour in School Aged Children 2006 survey, N=5358.

Figure 4.2: Sex differences in School Work Pressure and depressive symptomology score, controlling for social class, age, family living arrangement, self-rated health, life satisfaction, academic achievement and school satisfaction in Finland, from the Health Behaviour in School Aged Children 2006 survey, N= 4749.
4.2.2 Logistic Regression Results: The Effects on Current Smoking Behaviour.

“Model 1” in table 4.5 illustrates the effects of the socio-demographic variables on whether adolescents report current smoking or not. In Canada, all of the socio-demographic variables have an effect on current smoking except for sex (p>0.05). A perceived social status odds ratio of 0.842 (p<0.001) indicates that as perceived social status increases by one unit, the likelihood of adolescents reporting that they currently smoke decreases by 15.8%, controlling for age, sex and family arrangement. Age is positively related to current smoking (p<0.001); as age increases by one year, the likelihood of adolescents reporting that they currently smoke increases by 63%, controlling for perceived social status, sex and family arrangement. Compared to adolescents who live with both biological parents, adolescents in all other categories of family living arrangements have a higher a likelihood of current smoking (p<0.001), controlling for perceived social status, sex and age.

In the Finnish setting, perceived social status and sex have no effects on whether adolescents report current smoking or not. Age is again related to current smoking (p<0.001); adolescents are about two times as likely to report current smoking as age increases by one year, controlling for perceived social status, sex and family arrangement. On average, adolescents living with a lone mother (p<0.001) or lone father (p<0.01) or father and stepmother (p<0.01) or in ‘other’ living arrangements (p<0.001) are more likely to report current smoking than adolescents who live with both biological parents, controlling for other socio-demographic variables. However, the results show that there is no difference in the likelihood of current smoking between adolescents who live with a mother and a stepfather and adolescents who live with both biological parents.

The second model examines the effects of school work pressure and other correlates on whether adolescents report currently smoking or not, controlling for socio-demographic variables. In the
Canadian case, there is no effect of schoolwork pressure on current smoking, controlling for socio-demographic variables, self-rated health, life satisfaction, academic achievement and school satisfaction. Once we control for self-rated health, life satisfaction, academic achievement and school satisfaction, the only family arrangement categories that have a higher odds of current smoking compared to living with both biological parents are living with a father and a stepmother (p<0.01) and living in “other” arrangements (p<0.001). When school work pressure and other correlates are added to the model, the effect of perceived social status becomes insignificant. The effect of age on the odds of current smoking remains significant (p<0.001) with all other variables in the model. Self-rated health, life satisfaction, academic achievement and school satisfaction all have similar significant effects (p<0.001) on predicting whether adolescents smoke in Canada, controlling for socio-demographics and school work pressure. As self-rated health, life satisfaction, academic achievement and school satisfaction increase, the likelihood of adolescents reporting that they currently smoke decreases.

In Finland, the odds ratio for the effect of schoolwork pressure on whether adolescents currently smoke is insignificant. Therefore, there is no effect of school work pressure on current smoking habits among Finnish adolescents. When controlling for other socio-demographic variables, school work pressure and other correlates, the effect of perceived social status and sex remain insignificant on the odds of current smoking. Age continues to have a significant effect on smoking (p<0.001), showing that as age increases by one year the odds of adolescents reporting current smoking increases as well. The effect of family arrangement does change, however, when all other variables are added to the model. Controlling for perceived social status, age, sex, schoolwork pressure and other correlates, the only family arrangement category that has
Table 4.5: The effects of socio-demographic variables, school work pressure and depressive symptomology on whether adolescents smoke present. Logistic regression results from the Health Behaviour in School Aged Children 2006 Survey, Canada and Finlandab.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
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<tr>
<td>Depressive Symptoms e</td>
<td></td>
<td></td>
<td>1.28***</td>
<td>1.55***</td>
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<tr>
<td><strong>Other Correlates</strong></td>
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Notes:
- a. Odds Ratios shown.
- b. p<0.05*, p<0.01**, p<0.001***
- c. Reference group=male
- d. Reference group=living with both biological parents
- e. Performed a factor analysis of feeling low/depressed, irritated, nervous and sleeping difficulties to get a “depressive symptom scale”
an effect on odds of current smoking compared to those who live with biological parents are adolescents who live in “other” living arrangements. Adolescents who live in “other” living arrangements are about three times as likely to report current smoking compared to those that live with both biological parents (p<0.001). With regards to other correlates, self-rated health, academic achievement and school satisfaction have significant effects similar to Canadian results, controlling for all other variables in the model. As self-rated health (p<0.001), academic achievement (p<0.001) and school satisfaction increase (p<0.001), the odds of current smoking decreases for each variable.

The third model in this table evaluates the effect of depressive symptomology on current smoking in both contexts, controlling for socio-demographic and other correlates. In the Canadian context the odds ratio for depressive symptomology is 1.28 (p<0.001). This indicates that in Canada as the score on the depressive symptomology scale increases by one unit, the likelihood of adolescents reporting they currently smoke increases by 28%, controlling for socio-demographics and other correlates. The effects of all other variables do not change compared to the second model except that the effect of living with a lone father compared to living with both biological parents on odds of smoking becomes significant (p<0.05). The results show that adolescents that live with a lone father are more likely to report current smoking compared to those that live with both biological parents, controlling for all other variables.

In the third model in the Finnish sample, the odds ratio for the effect of the depressive symptomology on current smoking in the Finnish context is 1.55 (p<0.001). This shows that as the score on the depressive symptomology scale increases by one unit, then the likelihood of adolescents reporting that they currently smoke will increase by 55%, controlling for socio-
demographic variables and other correlates. The effects of all other measures in the model remain the same in Finland compared to “model 2”.

4.2.3 Logistic Regression Results: The Effects on Current Alcohol Consumption

The first model in table 4.6 shows the effect of socio-demographic variables on the odds of adolescents reporting whether they consumed any type of alcohol at present. The effects of socio-demographic variables on alcohol consumption are evident. In the Canadian model, although perceived social status and sex do not have an effect, as age increases by 1 year, the likelihood of adolescents reporting that they currently consume alcohol increases by 66%, controlling for perceived social status, sex and family arrangement. In the Canadian case, three categories of family arrangement - living with a lone mother (p<0.05), living with a lone father (p<0.05), and living with a mother and a stepfather (p<0.05) - have an effect on the odds of current alcohol consumption compared to living with both biological parents. On average, adolescents who live with a lone mother are 19% more likely to report currently drinking any alcohol compared to adolescents who live with both biological parents. Adolescents who live with a lone father are 54% more likely to report currently drinking any alcohol compared to those who live with both biological parents, and adolescents who live with a mother and a stepfather are 63% more likely to report currently drinking any kind of alcohol compared to adolescents living with both biological parents, controlling for age, sex and perceived social status.

In the Finnish context, all socio-demographic variables have an effect on the odds of reporting current alcohol consumption. As perceived social status increases by one of its units, the odds of adolescents reporting whether they currently drink alcohol decrease by 16.5%, controlling for age, sex and family arrangement. As age of adolescents increases in Finland by
one year, the likelihood of reporting currently drinking any alcohol increases by 89%, controlling for perceived social class, sex and family arrangement. A sex odds ratio of 0.756 (p<0.001) indicates that on average females are 24.4% less likely to report currently drinking alcohol than boys, controlling for other socio-demographic variables. In Finland, the only category that shows having an effect on the odds of current drinking compared to those that live with both biological parents are adolescents that live with a lone mother. An odds ratio of 1.28 (p<0.05) indicates that adolescents that live with a lone mother are 28% more likely to currently drink compared to those that live with both biological parents, controlling for sex, perceived social status and age.

The second model includes the effects of school work pressure and other correlates. The focus is the effect of school work pressure on odds of current drinking, controlling for socio-demographic variables and other correlates. In Canada, there is no effect of school work pressure on the odds of current drinking, controlling for every other variable in this model. The effects of perceived social status and sex remain insignificant and the effect of age remains significant (p<0.001). However, the effect of family arrangement changes controlling for perceived social class, age, sex, schoolwork pressure and other correlates. The only category that has an effect on odds of current drinking is living with a mother and a stepfather. On average, adolescents living with a mother and stepfather are 54% more likely to report currently drinking alcohol compared to those who live with both biological parents, controlling for other socio-demographic variables, school work pressure and other correlates (p<0.01). Looking at other correlates with school work pressure in the model, self-rated health has no statistically significant effect on odds of current drinking, controlling for socio-demographic variables, school work pressure and other correlates. Life satisfaction (p<0.01), academic achievement (p<0.001) and school satisfaction (p<0.001) all
Table 4.6: The effects of socio-demographic, school work pressure and depressive symptomology on whether adolescents currently drink. Logistic regression results from the Health Behaviour in School Aged Children 2006 Survey, Canada and Finland\textsuperscript{ab}.

<table>
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<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
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<td>1.08</td>
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<td>1.28*</td>
<td>1.06</td>
<td>1.24*</td>
</tr>
<tr>
<td>lone father</td>
<td>1.54*</td>
<td>1.51</td>
<td>1.37</td>
<td>1.33</td>
</tr>
<tr>
<td>mother+ stepfather</td>
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Notes:

- Odds Ratios shown.
- p<0.05*, p<0.01**, p<0.001***
- Reference group=male
- Reference group=living with both biological parents
- Performed a factor analysis of feeling low/depressed, irritated, nervous and sleeping difficulties to get a “depressive symptomology scale”.

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have a significant negative effect on the odds of current drinking, controlling for socio-demographic variables, schoolwork pressure and other correlates.

In model 2 for Finland, the school work odds ratio in Finland of 1.23 (p<0.001) indicates that as school work pressure increases by 1 unit, the likelihood of current drinking increases by 23%, controlling for socio-demographic variables and other correlates. The effects of socio-demographic variables also change in the Finnish case. The effect of perceived social status on the odds of currently drinking alcohol changes from significance in ‘model 1’ to non-significance in ‘model 2’ (p>0.05), controlling for other socio-demographic variables, school work pressure and other correlates. The effect of age (p<0.001) and sex (p<0.01) remain the same from ‘model 1’ to ‘model 2’. The only family arrangement category that has an effect on the odds of reporting currently drinking alcohol, controlling for all the added variables, is adolescents who live with a lone mother. An odds ratio of 1.24 (p<0.05) indicates that on average, adolescents in Finland who live with lone mothers are 24% more likely (or approximately 1 and a quarter times as likely) to currently drink alcohol compared to adolescents who live with both biological parents, controlling for all other variables. All other family arrangement categories have effects that are not statistically significantly different from adolescents who live with both biological parents, controlling for other socio-demographic variables, school work pressure and other correlates. With school work pressure and socio-demographic variables in the model, all other correlates have statistically significant effects on the odds of adolescents reporting currently drinking alcohol in Finland. Self-rated health (p<0.05), life satisfaction, academic achievement, and school satisfaction (all p<0.001) have negative effects, controlling for socio-demographic variables and school work pressure.
The third model in this table evaluates the effect of depressive symptomology on current alcohol consumption in both contexts, controlling for socio-demographics and other correlates. In the Canadian context, the odds ratio for the depressive symptomology is 1.23 (p<0.001). The odds ratio indicates that as depressive symptomology score increases by one unit then the likelihood of reported current drinking increases by 23%, controlling for socio-demographic variables and other correlates. In this model the effects of other variables on current alcohol consumption are similar to the effects they had in “model 2”. The only difference is that with depressive symptomology in the model, the effect of life satisfaction on the odds of drinking is insignificant.

A depressive symptomology odds ratio of 1.41 (p<0.001) in Finland (model 3) indicates that as depressive symptomology increases by one unit the likelihood of adolescents reporting that they currently drink increases by 41%, controlling for socio-demographic variables and other correlates. In the Finnish case in “model 3” the effects of other variables on the odds of current alcohol consumption also remain consistent with the effects they had in “model 2”. The Finnish example in “model 4” suggests some evidence that the effect of school work pressure on alcohol consumption is explained through depressive symptomology (variables that are in model 4 are the same and remain constant throughout the whole analysis). This is because both the magnitude and the significance of the coefficient for school work pressure decrease when depressive symptomology is added to the same model.
Chapter 5: Conclusion

5.1 Discussion

The primary aim of this study is to explore the relationship between school work pressure and depressive symptomology in adolescents. As is suggested by Pearlin (1981), the study of stressors and stress outcomes is sociological in nature because these variables are affected by the social structures that individuals find themselves in. I began my analysis by demonstrating that the stressor of school work pressure is patterned by socio-demographic indicators (as seen in appendix B). My research questions were then developed to demonstrate whether depressive symptomology is influenced by similar socio-demographic variables (*How do socio-demographic variables affect depressive symptomology in school-aged adolescents in Canada and Finland*?), and whether school work pressure affects depressive symptomology taking socio-demographic variables into account (*Net of all socio-demographic variables and other correlates, does school work pressure have an effect on depressive symptomology among school-aged adolescents in Canada and Finland*?). Next, I asked whether the effect of the stressor on the stress outcome varied by socio-demographic characteristics of respondents (*Net of relevant controls, do socio-demographic variables (gender, age, SES) moderate the relationship between school work pressure and depressive symptomology in Canada and Finland*?). This model was then further extended by looking at the behavioural outcomes of smoking and alcohol usage (research questions 5 and 6). The following sections in this chapter will elaborate on my results, providing answers to these research questions. My research examines all of these questions in two separate national contexts. By comparing the results between Canada and Finland, this work provides additional insight regarding whether mechanisms of the stress process model work differently in different contexts.
5.1.1 Depressive Symptomology

This section will summarize my findings regarding depressive symptomology as a stress outcome in the lives of adolescents. This section will entirely be based on the results from table 4.4. First, I will review my results that show that depressive symptomology is patterned by certain socio-demographic indicators in both countries. Then, I will discuss the results that explore the relationship between the stressor of school work pressure and depressive symptomology controlling for the same socio-demographic indicators and other relevant correlates of depressive symptomology. Finally, I will discuss the model that examines how socio-demographic variables are related to the existing relationship between the stressor and stress outcome. In each of these sections, I will incorporate a discussion of how these relationships differ between each of the countries.

5.1.1.1 Socio-Demographic Factors and Depressive Symptomology

Beginning with the multivariate linear OLS regression analysis in table 4.4, it is evident that socio-demographic indicators play a significant role in explaining depressive symptomology. Socio-demographic variables show significant effects on depressive symptomology among adolescents in both countries. Model 1 shows the effects of socio-demographic variables with no other controls in the model. All of the socio-demographic variables have similar effects on depressive symptomology in both countries, and together the socio-demographic variables explain almost the same amount of variance in frequency of depressive symptomology in each country. Both models show that socio-demographic indicators explain about 7% of the variance in depressive symptomology.
There is an observed negative association of socioeconomic status measured through perceived social status, where an increase in perceived social status resulted in a decrease in frequency in experiencing depressive symptomology. Interestingly, these results using the HBSC measure of SES (self-perceived “family well off-ness”) coincide with results in the literature that measures adolescent SES through family or parental income, education and/or occupational status (Barret & Turner, 2005; Bradley & Corwyn, 2002; Gore, Aseltine & Colten, 1992; Kubik et al., 2003; Rushton, Forcier & Schectman, 2002; Saaman, 2000; Siegel & Griffin, 1984; Torikka et al., 2014; Wight, SepUlveda & Aneschensel, 2004). These consistent findings provide further evidence for the suggestion that adolescents that are in lower SES have higher levels of depressive symptomology because of lower adaptive functioning due to the lack of resources they have (Bradley & Corwyn, 2002).

My results are also supported by literature that show an association of age such that as age increases frequency of depressive symptomology increases (Bodur & Kucukkendirci, 2010; Hankin, 2006; Kubik et al., 2003; Poulin, Bourdreaux & Santor, 2005; Rushton, Forcier & Schectman, 2002; Schraedley, Gotlib & Hayward, 1999; Siegel & Griffin, 1984) and that females report higher depressive symptomology scores than males (Avinson & McAlpine, 1992; Bodur & Kuchukkendirci, 2010; Coelho, Martins & Barros, 2002; McGuinness, Dyer & Wade, 2012; Poulne, Bourdreaux & Santor, 2005; Schraedley, Gotlib & Hayward, 1999). This could be due to the fact that as children get older they face greater social pressures through friends, peers and workloads as it usually becomes more intense as compared to when they are younger (Twenge & Nolen-Hoeksema, 2002; Hankin & Abramson, 2001; Nolen-Hoeksema & Girdus, 1994). Females are also subject to higher levels of depressive symptomology because of the different social pressures that they too experience and may have fewer psychological resources
(Avinson & McAlpine, 1992; Hankin & Abramson, 2001) and may be very concerned with social evaluation that could lead to depressive symptomology (McGuinness, Dyer & Wade, 2012).

Finally, family living arrangements are also associated with depressive symptomology in my study. Interestingly, there are differences concerning what types of living arrangements are associated with depressive symptomology between the populations of Canada and Finland. The one consistent finding was that in both countries, when controlling for other socio-demographic variables, adolescents living in other living arrangements (not living with either biological parent) reported a higher score in frequency of depressive symptomology compared to adolescents living with both biological parents. These results in both countries provide insight on the role that parents play in the mental and psychological well-being of adolescents. Parents provide emotional and psychological support that no other individuals can provide to adolescents (Carlson, 2006; McFarlane et al., 1995; McKeown et al., 1997; Rushton, Forcier & Schectman, 2002; Samm et al., 2010). A difference in results between the two countries is that when only controlling for other socio-demographic variables, Canadian adolescents who live with only mothers report higher scores on frequency of depressive symptomology compared to those that live with both biological parents. A possible reason for this result is because when adolescents are in these living arrangements they spend less time with their mother because mothers are usually spending more time outside of the home working and which results in adverse outcomes (Sampson & Laub, 1993). This would then ultimately affect the relationships as adolescents that report less meaningful relationships with any parent report higher levels of depressive symptomology (Carlson, 2006; McFarlane et al., 1995; McKeown et al., 1997; Rushton, Forcier & Schectman, 2002; Samm et al., 2010). In contrast there is no significant effect of living in a
lone mother arrangement for adolescents in Finland. This could relate back to macro-structural indicators where it is seen that because Finland is a much more universal welfare system than Canada (Bonoli, 1997; Kettunen, 2001; Pierson & Castles, 2006) may be is easier to be a single-parent in Finland. In fact there are many social programs in Finland that provide universal services and financial benefits to improve the well-being of children in all kinds of family structures (Ministry of Social Affairs and Health, 2013). It is important to acknowledge that when discussing the effects of family living arrangements on outcomes that there are selection processes that put adolescents into specific family arrangements. Research indicates that there are certain characteristics of children that determine their living arrangements, particularly whether they live with their father after their parents divorce (Maccoby, Depner & Mnookin, 2014). Therefore, when evaluating this relationship it is necessary to emphasize that the reverse effects could be true as well.

It is also important to discuss the effect of these socio-demographic variables as they progress through the models, as they highlight socio-demographic effects that persist when controlling for more correlates in the models. The results also highlight further differences in how socio-demographic variables affect depressive symptomology between the two countries. In the full model that includes school work pressure and other correlates of depressive symptomology that relate to health, school environment and academic achievement (model 3), it is noted that in both countries the association between age and depressive symptomology is no longer significant. This would indicate that the relationship of age on depressive symptomology are being explained through one or all of the correlates that were added: self-rated health, life satisfaction, academic achievement or school satisfaction. In contrast, sex still continues to have a in both countries. The fact that the effect of sex still persists highlights the importance of
research done on sex and depressive symptomology as explained in the literature review. In the full model, the association of living arrangement on depressive symptomology changes in both countries in a similar way. The effects of living with a single mother in Canada and living in other living arrangements in both countries go to no significance when other health indicators and school indicators are added to the model. This suggests that although there are existing effects of these living arrangements, they are explained through other health and school indicators. In both countries, once other correlates are controlled, the only living arrangement where adolescents report a higher level of depressive symptomology compared to adolescents living with both biological parents are adolescents who live with a biological mother and a stepfather. There are several theories in the literature that could explain why these results are evident in my research. Some literature suggests that stepfathers do not invest as much time as biological parents because they are not biologically tied and thus receive fewer rewards for being involved with step children. Adolescents in this kind of family arrangement may view stepfathers as polite strangers as their parenting is less involved, they are monitoring less and providing less warmth (Cherlin & Furstenberg, 1994; Daly & Wilson, 1998; Hetherington & Jodl, 1994; Popenoe, 1994). Other research suggests that adolescents experience more distress in stepfather families because the introduction of stepfathers can negatively affect the relationships between a mother and/or the non-residential father and the adolescent. Mothers usually are forced to balance their time between a new partner and their children, which can lead in the mother focusing less on children and causing child resentment (McLanahan & Sandefur, 1994). This is also pertinent with fathers as children find it difficult to maintain close bonds with their non-residential fathers once a stepfather has entered the family (Furstenberg & Cherlin, 1991; King, 2007; King, 2009) Whichever the case, literature suggests that what is most important when
exploring the effects of living arrangements on adolescents is the quality of the relationship between the parents (biological or not). When controlling for these factors, literature reveals that the relationship of family arrangement on depressive symptomology is negligible or less significant (Carlson, 2006; McFarlane et al., 1995; McKeeon et al., 1997; Rushton, Forcier & Schectman, 2002; Samm et al., 2010; Yuan & Hamilton, 2006).

Upon further evaluation of these results by making the mother/stepfather living arrangement the reference group, I found that in Canada adolescents who live in a mother/stepfather family had significantly higher depressive symptomology than adolescents who live with both biological parents. However, in Finland the adolescents in the mother/stepfather living arrangement had statistically different results from adolescents who live with both biological parents, lone fathers and a father and a stepmother. Adolescents in Finland who live with a lone father or with a father and a stepmother report lower depressive symptomology than youth that live in mother/stepfather arrangements. This shows that in there is a protective effect of living with both biological parents but also in Finland a protective effect of having a father in the household. Although the explanations of these differences are unclear, this research project did not include variables measuring family relationships or support and therefore could not explain why my results produced effects of family arrangement on depressive symptomology. These variables do exist in the HBSC and therefore this is something that could be explored further in future research.

Regression results presented in the thesis only use ‘2 biological parents’ as the reference category. Results using other family living arrangement categories as the reference category are available from author upon request.
5.1.1.2 School Work Pressure and Depressive Symptomology

My results show that, controlling for socio-demographic variables, the stressor of school work pressure is significantly associated with depressive symptomology in both countries. Table 4.4 reveals that in all of the models in both countries the relationship between school work pressure and depressive symptomology is positive. This means that adolescents that report having increased levels of school work pressure report depressive symptomology more frequently. Beginning in model 2 this relationship persists controlling for socio-demographic variables. This is supported by literature in the stress process model that suggests that controlling for socio-demographic indicators a stressor will cause a stress outcome such as depressive symptomology because the stressor creates strain in fulfilling the role ascribed to individuals (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999). Literature in adolescent research suggests that the primary role in an adolescent’s life is that of a student (Burnett & Fanshawe, 1996; deAnda et al., 2000; deAnda et al., 1997). Therefore, it is evident that school work pressure creates considerable amount of strain which results in depressive symptomology. This is also supported by literature that suggests that school work pressure is associated with depressive symptomology (Ang & Huan, 2006; Anderman, 2002; Davis et al., 2002; Karvonen & Rimpela, 2005; Lee & Larson, 2000; Low et al., 2012). Also, it is pertinent to point out that this relationship persists in both countries in the full models that take into consideration other aspects of adolescents’ perceptions of school life such as school satisfaction and academic achievement.

The differences between the Canadian and Finnish findings should be highlighted as well. It is revealed that the actual effect of school work pressure on depressive symptomology is stronger among Finnish adolescent than Canadian adolescents. This is concluded because in
model 2 the effect of school work pressure on depressive symptomology is bigger in magnitude in Finland than Canada. However, this was more correctly confirmed with evaluation of the standardized coefficients between the two countries. The standardized coefficient for the effect of school work pressure on depressive symptomology in Canada is 0.273 and 0.320 in Finland (refer to table B2, both significant). This confirms that a one standardized unit increase of school work pressure in Finland results in a greater standardized effect on depressive symptomology. This is also validated when evaluating the variance explained between the two countries in model 2. The variance explained in the Canadian model when school work pressure is added to the model is 14%. This is compared to the Finnish model that explains 17% of the variance. Controlling for socio-demographic variables, school work pressure felt by adolescents in Finland explains more of the variance in how often adolescents experience depressive symptomology compared to school work pressure experienced by Canadian adolescents.

This finding may seem surprising because Finland is critically acclaimed as one of the best education systems in the world with well-trained teachers and where students are given many opportunities and much support (Kupiainen et al., 2009; National Center on Education and the Economy, 2015; Sahlberg, 2007). However, it is also recognized that education culture is very important in Finland. The Finnish government places a high value on education, which may result in adolescents (and their parents) valuing education more. Tuominen-Soini & Salmela-Aro (2014) found that among Finnish adolescents, students who were more cynical and did not show any care towards school work reported less depressive symptomology than those who were engaged and valued school work. Further, research in other geographic areas suggests that when others have high expectations about school success, it is a risk for an adolescent to report depressive symptomology because of the pressures to succeed (Roeser, Eccles & Sameroff,
Although this is something to look at in further research, these results might suggest that a culture that places such importance on education can lead to adolescents feeling more pressure to succeed. Another aspect that can explain these results is that international reports show that among countries that perform well on the PISA examinations, Finnish adolescents are found to be unmotivated. This is due to the fact that they regularly come out in international studies as less interested and less motivated to engage in school. Thus, Finnish adolescents have been labelled as “unmotivated achievers” (Kupiainen et al., 2009). Although the reasons regarding why Finnish adolescents are unmotivated are unclear (Kupiainen et al., 2009), it could explain why the effect of school work pressure on depressive symptomology is stronger in Finland than in Canada. A study done on Finnish adolescents shows that adolescents who are engaged with school work but are unmotivated because of exhaustion produced by school work report higher levels of depressive symptomology than those who feel motivated to engage with school work (Tuominen-Soini & Salmela-Aro, 2014). This difference exemplifies my argument that although the experience of this specific stressor does in fact result in negative stress outcomes in the lives of adolescents, the relationship between school work pressure and depressive symptomology is also influenced by national context.

5.1.1.3 Socio-Demographic Moderation

The final section in reviewing models that attempt to explain variance in depressive symptomology is model 4. Research and theories in the stress process model also suggest that to really understand how stress outcomes are influenced by socio-demographic indicators they should not only be used as controls in models, but should also be included in interaction with the focal stressor (Pierlen, 1989). It is for this reason that I also tested moderation effects. I tested the
effects of the socio-demographic measures on the relationship between school work pressure and depressive symptomology. There were no significant moderation effects for any socio-demographic indicator in either country except for sex. This effect is indicated by the significant multiplicative term (interaction term) in the Finnish model. As was already established in the previous model (model 3) in both Canada and Finland, school work pressure positively affects frequency of experiencing depressive symptomology. The significant multiplicative term in Finland between school work pressure and sex suggests that this effect is stronger for girls than for boys. This is also depicted in figure 4.2. Research has shown that girls show greater concern about school (Berg & Klinger, 2009; Gillies, 1989; Huan, See, Ang & Har, 2008; Simon & Ward, 1982) and also worry more about school work (Gallagher, Millar, Hargie & Ellis, 1992; Gallagher & Miller, 1998). Karademas et al. (2008) also show that girls perceive more demands from school which results in more health complaints that include depressive symptomology. Also, in Finnish studies Tuominen-Soini & Salmela-Aro (2014) and Salmela-Aro & Tynkkynen (2012) found that girls are more likely to experience exhaustion from school work which can have an effect on their psychological well-being. However, what exemplifies the importance of context again is that this relationship is only observed among Finnish females and not Canadian females. In fact as figure 4.1 exemplifies in the Canadian population, the effect of school work pressure on depressive symptomology is the same for boys and girls in Canada. This again is surprising because it is in Finland that females have more equality and are systematically more empowered than females in Canada (UNDP, 2013). Finland places a high commitment to education; it has translated on adolescents placing high commitment to school. Studies show that adolescents that have a high commitment to school are more vulnerable to emotional distress (Roeser et al., 1998; Tuominen-Soini et al., 2008). Although the mechanism or explanations are
unclear, this result suggests that there may be further gendered expectations that females in Finland face that are not present among Canadian females.

5.1.2 Smoking

This section will address the area of my research focusing on smoking as a behavioural outcome of a stressor. This section will make reference entirely to table 4.5. First, I will review the results that show that smoking is structured by certain socio-demographics indicators in both countries. Then, I will discuss the results that explore the relationship between the focal stressor (school work pressure) and smoking, controlling for the same socio-demographic indicators and other relevant correlates. Finally, I will review the relationship between depressive symptomology and smoking behaviours. In each of these sections I will include a discussion on how these relationships differ between each of the countries where relevant.

5.1.2.1 Socio-Demographic Factors and Smoking

By referring to the logistic regression model results in table 4.5 it is concluded that several socio-demographic variables are related to current smoking among adolescents. The most consistent predictor of current smoking status throughout all the models in both countries is age. The results show the association between age and smoking such that as age increases the odds of an adolescent being a current smoker increases as well. These results are mirrored by literature that states that as adolescents age they are more exposed to situations and pressures that will induce smoking behaviours (Hoffman et al., 2006; Larson & Ham, 1993).

Family living arrangements are also related to whether adolescents currently smoke or not. Model 1 shows that in both countries adolescents that live in any type of family arrangement other than with two biological parents are more likely to report current smoking. This again
highlights a theme that became prominent in this thesis and that is of the protective effect of living with both biological parents. However, when included with all other controls in model 4 the only family arrangement where adolescents are more likely to currently smoke in both countries compared to living with both biological parents is the ‘other’ category (living with neither parent). This again shows the importance that having at least one parent living with an adolescent. Among the adolescents in the Canadian sample, adolescents that live with either a lone father or a father and stepmother also report a higher likelihood of current smoking compared to adolescents living with both parents. This further shows the importance of not just a parent but having a mother in the household. To further explore the results of these findings I set all of the family living arrangements that were significant in ‘model 4’ compared to both biological parents as reference groups in both countries. In Canada, adolescents who lived with a lone father were only statistically more likely to smoke than adolescents who live with both biological parents. Adolescents who lived with a father and a stepmother and other arrangements were more likely to report current smoking compared to adolescents living with both biological parents and all family living arrangements where a biological mother is present. This was also similar for Finland. When making the ‘other’ category a reference group, adolescents who lived in other arrangements were statistically more likely to report current smoking than adolescents who lived with both biological parents and all living arrangement where a biological mother is present. These findings show the protective effects of not just living with two biological parents but also the protective effects of living with a biological mother in both countries. Research indicates that these results can be explained because mothers are depicted as a focal figure in the family and serve as the emotional anchor that serves to nurture children and provide emotional support and regulation (Morris, Silk, Steinber, Myers & Robinson, 2007; Simon, 1995). At times
this can also provide protective factors against substance usage. For example, Luk, Farhat, Iannotti & Simons-Morton (2010) found that easy communication with mothers resulted in a negative relationship to smoking. This was particularly relevant with mother-son communication. However, because of the cross-sectional nature of the data it is difficult to say for certain that these relationships are causal. As already mentioned previously, this is important because research indicates that children’s characteristics can determine the living arrangement after parents separate. Thus, although this research finds an association where living arrangements result in outcomes there is the possibility that characteristics of children determine where they live (Maccoby, Depner & Mnookin, 2014).

Socio-demographic indicators that do not have a significant association on current adolescent smoking status in the full models are SES (measured by perceived family status) and sex. With regards to the SES measure used in the model, it is seen that in Canada SES does have an effect on the smoking status of adolescents, controlling for other socio-demographic measures only. Model 1 shows that the more well off adolescents believe their family is, the less likely they are to be smokers. In general this is what is suggested in the literature (Barnett, Pearce & Moon, 2009; Bryant, Bonevski & Paul, 2011; Cavelaars, Kunst & Geurts, 2000; Dube et al., 2009; Hiscock et al., 2012; Kunst, Giskes & Mackenbach, 2004; Laaksonen et al., 2005; Reid, Hammond & Driezen, 2010). However, this is not seen in the Finnish population. As measures of depressive symptomology, school work pressure and school and health indicators are added to the model (model 4), it is seen that this relationship in Canada is also non-significant. This shows that although there may be an association between SES and smoking in Canada there are other aspects of an adolescent’s life that contribute more in explaining smoking behaviours or that the effect of SES operates through other variables such as other health indicators and other school
indicators added in the models. Finally, in both countries, sex did not show any effect on smoking behaviours in any of the models. Although, some literature suggests that at certain ages females tend to be smokers more often than males (Bostock, 2007; Harrell et al., 1998; Voorhees et al., 2002) my results could be explained by the fact that this indicator used in this research of smoking is a narrow measure of this behaviour. Research maintains that although boys and girls may have similar pressures to start smoking (Amos & Bostock, 2007), males are usually more likely to be experimental smokers (Harrell et al., 1998) and out of adolescents that smoke, girls are more likely to smoke more often (Bostock, 2007; Harrell et al., 1998; Voorhees et al., 2002).

It is apparent that when adolescents engage in smoking they are doing it at different times and for different reasons. Perhaps the reason why my results do not show a sex effect on smoking is because my measure does not address the complexity of which individuals of different sexes uses the substance in question; an issue that can be explored further.

5.1.2.2 School Work Pressure and Smoking

My results show that controlling for demographic variables and other correlates, school work as a stressor is not associated with smoking behaviours among adolescents in either country. From the literature that exists it is evident that adolescents can pick up smoking as a stress coping mechanism from school work (BMRB, 2007; Kirby et al., 2008; Sutherland & Shepherd, 2001; Samdal et al., 2000; Tyas & Pederson, 1998). However, research also indicates that there are other substances that adolescents turn to for coping with demands that come from school and school work (BMRB, 2007; Kirby et al., 2008). Kirby et al. (2008) suggest that it is more prominent for adolescents to turn to alcohol for pressures and coping with school work than smoking. Interestingly, other aspects of school that are present in the model are associated with smoking behaviours in both countries. When students like school more they are less likely
to smoke and when academic achievement increases the odds of smoking also decreases. This exemplifies what literature also states that other aspects of schooling is important in predicting smoking (Luthar & Beckar, 2002; O’Loughlin et al., 2009) and perhaps they are a more pertinent in predicting smoking than school work pressure.

5.1.2.3 Depressive Symptomology and Smoking

Literature indicates that depressive symptomology is significantly related to smoking behaviours. Some research that particularly looks at this in this area has found that adolescents with depressive symptomology are more likely to smoke (Boys et al., 2003; Dierker et al., 2002; Goodman & Capitman, 2000; Mayfield Arnold et al., 2014; Patton et al., 1996; Pederson et al., 1997; Soteriades & DiFranza, 2003; Tyas & Pederson, 1998). In models 3 and 4 there is a significant relationship between my measure of depressive symptomology and smoking in both countries. The relationship that is observed is that as adolescents have higher levels of depressive symptomology, the odds of smoking increases. These results can be explained because adolescents usually use substances as coping mechanisms for their stresses that cause depressive symptomology (Boys et al., 2003; Dierker et al., 2002; Goodman & Capitman, 2000; Mayfield Arnold et al., 2014; Patton et al., 1996; Pederson et al., 1997; Soteriades & DiFranza, 2003; Tyas & Pederson, 1998). However, because of the cross-sectional nature of the data is difficult to determine if this uni-directional effect actually exists. Some studies suggest that the effect of depressive symptomology on smoking is bidirectional (Chaiton et al., 2009; Munafo et al., 2008).
5.1.3 Alcohol Usage

This section will address the area of my research that examines current alcohol usage as a behavioural outcome of a stressor and a stress outcome. The results that will be discussed in the following sections will be based on the results from table 4.6. First, I will review my results that show that current alcohol usage is structured by certain socio-demographics indicators in both countries. Then, I will discuss the results that explore the relationship between the stressor of school work pressure and current alcohol usage controlling for the same socio-demographic indicators and other relevant correlates. Finally, I will review the relationship between depressive symptomology and current alcohol usage. I will also include a discussion on the final model on the relationship of school work pressure and depressive symptomology in the same model. In each of these sections I will include a discussion on how these relationships differ between the two countries where relevant.

5.1.3.1 Socio-Demographics and Alcohol Usage

By referring to the logistic regression model results on table 4.6, it is concluded that socio-demographic variables are significantly associated with alcohol usage. Age and sex are the most consistent predictors in explaining whether an adolescent will drink alcohol. The significant effects of these two variables remain throughout the four models. The results suggest that as age increases then the likelihood of adolescents reporting that they drink increases in both countries. This coincides with literature on substance usage that states that as adolescents age they are more exposed to situations and pressures that will induce drinking behaviours (Currie, 2008; Flewelling & Bauman, 1990; Habib et al., 2010; Hamilton et al., 2013; Leatherdale & Burkhalter, 2012; Leatherdale et al., 2008; Lintonen et al., 2000). Also, my results show that
females are less likely to drink compared to males in Finland. This is what most of the literature on alcohol behaviours highlights as well. In general males drink more than females (Chen & Jacobson, 2012; Currie, 2008; Habib et al., 2010; Leatherdale et al., 2008; Leatherdale & Burkhalter, 2012; Kwon, 2013; Lintonen et al., 2000; Poikolainen et al., 2001; Small et al., 2014) due to the pressures that are more salient among boys that induce drinking behaviours (Bahr, Hoffmann, & Yang, 2005; Flannery, Vazsonyi, Torquati, & Fridrich, 1994; Hawkins et al., 1992; Kung & Farrell, 2000; Li, Pentz, & Chou, 2002; Reed & Roundtree, 1997; Thornberry & Krohn, 1997). However, the effect of gender is not significant for the Canadian population. It is unclear as to why there is a difference between country contexts but it could be due to the fact that Finnish adolescents are known to mirror the culture of excessive drinking that is present among adults (Jarvinene & Room, 2007), and research shows that boys are more likely to binge drink in these cases (Currie, 2008). Another reason regarding why there is no effect of sex on alcohol use in Canada is because the gap in alcohol consumption between boys and girls has been decreasing over time. This is partly due to the fact that there has been an increase in girls and women consuming alcohol and that the rates of males consuming alcohol have remained the same or even decreasing over time (Health Canada, 2010; Young et al., 2011). Finally, SES does not seem to be associated with drinking among adolescents in either country.

Existing literature has also demonstrated that when adolescents do not live both biological parents they are at a high likelihood to engage in drinking (Bjarnason et al., 2003; Blum et al., 2000; Flewelling & Bauman, 1990; Habib et al., 2010; Hamilton et al., 2013; Isohanni et al., 1994; Kwon, 2013; Ledoux et al., 2002; Miller, 1997; Small et al., 2014; Vanassche et al., 2014). My research confirms this by showing that adolescents living in arrangements that are not with both biological parents are at increased odds to drink (model 1).
However, once all other variables are included in model 4, Canadian adolescents that live with a mother and a step-father and Finnish adolescents that live with a lone mother are more likely to drink alcohol compared to adolescents that live with both biological parents. In both of these situations, adolescents are living without a biological father. To further explore these differences, I evaluated these effects by setting these significant living arrangements as reference groups. In Canada and Finland there are significant differences in drinking behaviour between the mother/stepfather arrangement and the lone mother arrangement compared to adolescents living with both biological parents. This perhaps indicates a protective effect of living with both biological parents on alcohol consumption. However, my results give some indication of the importance of the father figure in mediating alcohol consumption. Fathers provide a stabilizing influence in the family that is protective against alcohol consumption. Research also indicates that fathers play an imperative role on an adolescent’s social-emotional development. The absence of fathers can therefore affect adolescents in a negative way and often presents itself among adolescents increasing in negative externalizing behaviours (McLanahan, Tach & Schneider, 2013). Again, selection processes where characteristics of children determine where they live is acknowledged (Maccoby, Depner & Mnookin, 2014). Therefore, when evaluating the effects of family living arrangement on alcohol usage it is important to recognize that this is not a causal relationship.

5.1.3.2 School Work Pressure and Alcohol Usage

When referring to the relationship between school work pressure and alcohol usage on adolescents there is an interesting difference that is evident between the two countries, thus highlighting the importance of studying the contextual effects of adolescents living in different countries. In model 2, increasing school work pressure does not have an effect on predicting the
likelihood that an adolescent will report current drinking in Canada. This is in contrast with the results that show that as school work pressure increases by one unit, the likelihood that a Finnish adolescent will drink increases by 23%. However, this does not mean that school life is not important among Canadian adolescents. My results show that as academic achievement and school satisfaction increases the likelihood of adolescent reporting they drink also decreases. This is also similar among adolescents in Finland. These results show two important things. Firstly, the literature suggests that when adolescents are experiencing stress because of the actual work load of school they are more likely to engage in drinking alcohol than any other substance including smoking (Kirby et al., 2008). This is evident in my results as there is a significant effect of school work pressure on alcohol consumption but not on smoking among Finnish adolescents. These results also show the importance of country context. As is already established in the results based on depressive symptomology, adolescents in Finland may be more strongly affected by the pressures of school work than adolescents in Canada. It is suggested that this could be related to the importance placed on education in Finland. Research has found that adolescents that are under situations where education and education success is important are more subject to be at risk for negative health outcomes such as more distress and alcohol usage (Laftman, Almquist & Ostberg, 2013; Luthar, 2013; Suldo & Shaunessy-Dedrick, 2013). However, more research is needed in this area as it is difficult to define what about school work pressure has a greater effect on Finnish adolescents than Canadian adolescents.

5.1.3.3 Depressive Symptomology and Alcohol Usage

Literature indicates that depressive symptomology is significantly associated with alcohol usage among adolescents. The research that particularly looks at associations of the effect of depressive symptomology on alcohol usage find that adolescents with depressive symptomology
are more likely to drink alcohol (Boys et al., 2003; King et al., 2004; Kwon, 2013; Nation & Heflinger, 2006). These are the results that were obtained in this project as well. This is concluded because in models 3 and 4 there is a significant relationship between my measure of depressive symptomology and current drinking in both countries. The relationship that is observed is that as adolescents have depressive symptomology more frequently the odds of current drinking increases. These results can be explained because adolescents usually use substances as coping mechanisms of their stresses that cause depressive symptomology (Boys et al., 2003; King et al., 2004; Kwon, 2013; Nation & Heflinger, 2006). However, because this is cross-sectional data it is hard to determine the direction of the relationship. In fact, research suggests that there is much discrepancy in determining causal relationships between depressive symptomology and alcohol usage (Boden & Fergusson, 2011; Nation & Heflinger, 2006; Swendsen & Merikanga, 2000).

My project set out to evaluate the relationship of school work pressure and depressive symptomology on substance usage in both countries. This analysis has found that school work pressure is not related to smoking behaviours among adolescents in Canada or Finland. School work pressure is not related to alcohol usage among Canadian adolescents, but it is related to alcohol usage among Finnish adolescents. Depressive symptomology is associated with smoking and alcohol usage in both countries. What is also observed is an interaction between school work pressures, depressive symptomology and alcohol usage in the Finnish case. Model 4 of table 4.6 shows that when adding depressive symptomology to the model with school work pressure the magnitude of the odds ratio decreases for school work pressure. This gives evidence to suggest that the effect of school work pressure on predicting whether an adolescent will drink is partially explained through depressive symptomology. This again is exclusively found in the Finnish
model and not in the Canadian model. Again, these results reinforce the notion of the importance of evaluating the effects present in different contexts. These results yet again showcase the potentially profound effects the education system has on adolescents in Finland and it is something that can be explored further in future research.

5.1.4 Discussion Summary

Referring back to the stress process model, this thesis explored how mental health outcomes and health risk behavioural outcomes (smoking and drinking) related to mental health are structured by socio-demographic variables. However, this thesis also showed that the socio-demographic variables are related to outcomes differently between the two countries. With regards to depressive symptomology, the effects of sex were similar in both countries where girls reported higher levels of depressive symptomology than boys. The relationship of family living arrangement was similar for both countries such that adolescents living with a mother and a stepfather had higher levels of depressive symptoms than adolescents living with both biological parents. This highlights the protective effects of living with both biological parents in both countries. It was also found that SES is not a predictor of depressive symptoms in Finland but it is for Canadian adolescents. Finally, the interaction term further exemplified differences between countries as being a female had an additive effect on the relationship between school work pressure and depressive symptoms in Finland but not in Canada.

Socio-demographic indicators also explained substance usage among adolescents in both countries. With regards to smoking, age was a consistent predictor of current smoking in both countries. The family living arrangement variable highlights the protective effects of living with both biological parents in predicting current smoking in both countries. It also shows the
protective effect of living with a biological mother on current smoking in both countries. Age was also a consistent predictor in current alcohol usage in both countries. However, sex was a predictor in current alcohol usage in Finland but not in Canada. Finnish boys were more likely to report current drinking than girls. The family living arrangement variable also shows that there are protective effects of living with both biological parents on alcohol consumption but also, in particular in Canada, a possible added protective effect of living with a father on alcohol consumption was observed. Although the reasons for the differences in the effects of living arrangements on smoking and drinking are unclear, what is found to be relevant throughout this thesis are the protective effects of living with both biological parents.

5.2 Limitations

This project has several limitations that should be addressed. The first limitation deals with the nature of developing cross-national studies across many different cultures. As was mentioned, the HBSC is not only used as a tool to observe and determine trends nationally, but it is also a tool to compare and test trends internationally. Studies such as these can provide great advantages because it can provide meaning and sense for individuals that may deviate in health and also can provide insight on cultural differences in responses (Olafsdottir & Pescosolido, 2011). However, as Medina, Smith & Long (2009) argue regarding cross-national studies, “practitioners must be careful not to assume that the availability of cross national survey data implies the appropriateness of cross-national comparison” (p.334). This is because even though an indicator may fit in one nation it will not necessarily be an indicator for another nation. Many of the constructs used in cross-national studies vary from nation to nation because of the different cultures, public attitudes, social structure and institutional arrangements present in each country (Olafsdottir & Pescosolido, 2011; Medina et al., 2009; Roberts et al., 2009; Smet, Maes,
De Clercq, Haryanti & Winarno, 1999). Roberts et al. (2009) noted that problems result when attempting to expand the HBSC study in other countries, as cultural, religious, language and socio-economic conditions vary widely according to region. All of these aspects are noted to present problems in creating indicators and constructs that are eligible for comparisons.

It is apparent that these issues are present when using these surveys within a heterogeneous nation; it can only be imagined that these problems are more profound when wanting to implement them across many different nations. Differences in culture, educational structure, government structure, social/public attitude, and policy making pressures between countries may arise in different individuals creating different meaning and significance to questions being asked. It is also possible that all of these differences will also affect the way administrators of the study ask certain questions in certain contexts and thus affect the comparability of the samples. I also tried to eliminate such problems in this study by selecting two countries that are fairly similar to one another. However, there is always the understanding that there are still differences between these two countries that can alter the way adolescents interpret questions. To truly understand how adolescents are interpreting the questions given their cultural values and norms requires an in depth understanding on what occurs in each country. This is something that I believe is lacking in this research, particularly in reference to the education systems of both countries. This is of particular interest in this research because all of the measures used in this project are also self-rated measures. An example of this is with the SES measures used in the HBSC. The Family Affluence Scale (FAS) asks participants about family ownership of a telephone, car/vehicle, whether the adolescents has his/her own bedroom, and family holiday times (Currie et al., 2008). This scale has been utilized to represent SES in much of the literature using the HBSC data (Boyce et al., 2006; Currie et al., 2008; Molcho et al.,
2007; Schnohr et al., 2008). However, Schnohr and colleagues (2008) state that there are cross
country variations on how much each item contributes to the family affluence scale. Even
further, when comparing this with asking adolescents about their perceived family affluence (the
measure used in this study) diverging results could be obtained because for example when
comparing two adolescents that own a telephone or that do not have their own room may have
the same affluence score on the FAS scale but may have different perceptions on what that
actually means in terms of how affluent their families are depending on the country they live in.
This exemplifies how difficult it is to engage in cross-national comparisons and how important it
is to acknowledge the limitations that arise through these kinds of studies.

Another limitation in this study is that of measurement. The primary concern is how the
depressive symptomology scale was constructed. Studies on depression inventory measures, such
as the Children’s Depression Inventory (CDI) or the Mood and Anxiety Symptom questionnaire
(MASQ), include multiples aspects of depressive symptomology (Boschen & Oei., 2007; Saylor
et al., 1984). Although my research used these scales to guide the selection of symptoms, due to
the nature of the survey I was only able to include 4 measures. These included ‘feeling
low/depressed’, ‘nervous’, ‘irritated’ and ‘difficulty sleeping’. In order to get a more in depth
understanding of what depression looks like through depressive symptomology and how it truly
is affected by other variables, I believe it is essential to include more individual measures to the
scale. Unfortunately, this was not available with the data that I obtained. This was also similar
with the measurement of the school work pressure variable. The alpha coefficient is potentially
low due to the fact that there was only one measure used and thus there is the potential of
misrepresenting relationships. The SES measure is also of particular importance in this research.
Most research investigating the effects of SES on the dependent variables in my study use family
or parental measures of income or occupational status of parents (Barret & Turner, 2005; Bradley & Corwyn, 2002; Gore, Aseltine & Colten, 1992; Kubik et al., 2003; Rushton, Forcier & Schectman, 2002; Saab & Klinger, 2010; Saaman, 2000; Siegel & Griffin, 1984; Torikka et al., 2014; Wight, SepUlveda & Aneschensel, 2004). Although there is research that indicates that using a self-reported measure of family status is appropriate for measuring SES level of an adolescent (Saab and Klinger, 2010; Schnohr et al., 2008), there were other measures that should have been used in this project that could have been more beneficial to evaluate the SES of an adolescent. This includes the Family Affluence Scale that asks adolescents about family ownership of a telephone, car/vehicle, whether the adolescents has his /her own bedroom, and family holiday times and is commonly used in other HBSC research (Boyce et al., 2006; Currie et al., 2008; Molcho et al., 2007; Schnohr et al., 2008). Another aspect of measurement is that several of my measures may be measuring the same thing. For example life satisfaction, self-rated health and school satisfaction could be highly correlated to depressive symptoms and therefore it could be masking effects of depression by including these other variables as controls. Furthermore, even the fact that school work pressure and depressive symptomology are self-rated measures could mean that adolescents scoring high on both could just represent an underlying dissatisfaction with life in general.

Finally, with regards to measures, a difficulty that is highlighted in cross-national data is the availability of the same measures being present in all countries. This was also an issue present in this study. For example, with measures of socio-demographic indicators there is a large amount of research that shows how ethnicity/race of an adolescent affects depressive symptomology, especially in relation to school work pressures (Fuligni & Stevenson, 1995; Mizokawa & Ryvhman, 1990; Aldwin & Greenberger, 1987; Roberts et al., 1997; Saaman,
2000). However, because a variable of ethnicity/race or anything related to it was not available or asked in both countries it was not included in the models. This was also true about pubertal development. Even though this thesis acknowledges the effects of pubertal development on the outcomes of this project (MacPhee & Andrews, 2006; Marcotte et al., 2002; Rudolph & Flynn, 2007; Twenge & Nolen-Hoeksema, 2002), this measure was also not added as it was not a standard question in both countries. This again highlights the limitations that can arise by attempting to do research in different geographic areas governed by different researching bodies.

A large issue for in-school surveys is the fact that students who are absent on the day the survey is administered do not participate in the survey. Thus, those who are more frequently absent are disproportionately missing from the data (Roberts et al., 2009). Such non-response issues can raise problems for analysis depending on the research interests. Non-response due to absence is definitely a concern for this research project, which focuses on depressive symptomology. Children that exhibit symptoms of depression are more likely to refuse to attend school (DeSocio & Hootman, 2004; Egger et al., 2003; Kearney, 2008). Other research on school absenteeism suggests that other factors that can affect adolescents missing school are school demand problems and academic failure and behavioural problems and socio-demographic indicators (i.e. low SES) (Dube & Orpinas, 2009; King & Bernstein, 2001; Rothman, 2001). Therefore, the HBSC data could potentially underestimate the prevalence of depressive symptomology, school work pressure and even substance use among adolescents.

Finally, there is the apparent limitation of this research project being based on cross-sectional data. This is particularly important to consider in my research because I am dealing with measures that are primarily self-rated. For example, frequency of depressive symptoms can mean and represent so many different things to a child or adolescent depending on the
circumstances they are in at the moment they are participating in this study. To really understand these things it is necessary to look at them over time because the experience and meaning of a mental health outcome such as depressive symptomology or anxiety may change over time. These changes can be a result of individual characteristics but also a result of greater social forces a child may be going through, over time. This means that my analyses are limited because I cannot really assume causality with the results obtained in this project.

5.3 Future Research Considerations

First and foremost, future research could be conducted to address limitations of this study. Although these limitations are primarily a result of the data produced through the HBSC, there could be other sources or studies that address issues pertaining to lives of children and adolescents. It would be interesting to engage in an in-depth analysis of results in the respective countries first in order to have a clear rational of effects before engaging in cross-national comparison. Also, the issue of cross-sectional data could be avoided if similar studies of school work pressures and its effects on depressive symptomology and substance usage were performed with longitudinal data. Finally, since the measures used in the HBSC are standard for every country (Currie, 2008; HBSC Network, 2014) it would be of benefit to engage in this study using other sources of data or even in conducting my own research in the area. By doing this I could ensure that I would be using measures needed such as ethnicity/race and would be more appropriately measuring indicators that were in this study (i.e. SES, depressive symptomology).

Other aspects of future research could be developed based on the theoretical model used in my project. As mentioned, the stress process model is a theoretical framework that addresses how stressors affect a stress outcome and how these aspects are structured through socio-
demographic indicators. A crucial component that was missing in this project that is relevant to this model is the component of how social support and coping resources (psychosocial resources) mediate the relationship between a stressor and a stress outcome (Pearlin & Bierman, 2013; Pearlin et al., 2005; Pearlin & Skaff, 1996; Pearlin, 1989; Pearlin et al., 1981; Turner & Lloyd, 1999; Turner, Wheaton & Lloyd, 1995). The HBSC does include measures that would be known as psychosocial resources and could have potentially been used in this project. However, due to my interests in substance usage and the complexity of the models at present I decided to focus on the part of the stress process that dealt with the effects of a stressor and stress outcome and its effect on substance usage. By including these mediating resources in future research I would be incorporating more of the stress process model and would even have the potential to study pathway analyses of the models. Another aspect of theory that is suggested to explore further based on my research is that of the bidirectional nature of depressive symptomology and substance usage. Much research suggests that depressive symptomology and alcohol usage and smoking are bi-directional and comorbid (Briere, Rohde, Seeley, Klein & Lewinsohn, 2014; Chaiton et al., 2009; Munafo et al., 2008). This project found an association where depressive symptomology resulted in an effect of smoking and alcohol usage but it would also be relevant to explore the opposite effects as well.

Another aspect of my research that could be developed further deals with the results found in the Finnish model that highlighted the effects of school work pressure and alcohol consumption and the effect of depressive symptomology on the original effect. By using Barron & Kenney (1986) to find some evidence of mediation it was discovered that there was an association where the relationship of school work pressure on alcohol usage was partially explained through depressive symptomology. This, however, was not statistically examined to
determine the significance of the indirect effect. Some research in other areas has been found to use Sobel tests to determine significance of mediation effects on models using logistic regression (MacKinnon & Fairchild, 2009; MacKinnon, 2008; MacKinnon, Fairchild & Fritz, 2007). However, controversy exists on the efficacy of such tests. Some literature suggests that other methods to test mediational effects in logistic models should be considered such as Delta methods, Bootstrap estimates and Bayesian estimates (Huang, Sivaganesan, Succop & Goodman, 2004). This is something that could be further explored in future research.

Finally, the idea of this research project is rooted on my lived experiences of being a teacher internationally. Based on this there was interest in engaging in qualitative research in the area of the effects of school work pressures on depressive symptomology. As my literature review mentioned, qualitative research has shown that school work pressure has negative effects on the mental health of adolescents as told from the perspective of the lived experiences of school children (Lin & Chen, 1995; Phelan et al., 1994). By engaging in qualitative analysis, I could also be able to deal with one of the limitations in this study. Determining how students interpret survey questions based on the context of their school lives is difficult in quantitative analysis. This could however be further explored by following up results with qualitative research in order to provide insight on the lived experiences of adolescents; specifically on how school work pressure affects stress outcomes such as depressive symptomology.
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Isohanni, M., Oja, H., Moilanen, I., & Koiranen, M. (1994). Teenage alcohol drinking and non-


Appendix A: Construction of smoking and alcohol usage variables

1. This measure that examines smoking behaviours asked participants how often they smoke tobacco at present. Possible responses were ‘every day’, ‘at least once a week, but not every day’, ‘less than once a week’ or ‘I do not smoke’. This measure is an ordinal measure, but I first used it as a continuous variable. The original codes for this variable are from 1 through 4. I reverse coded the categories so that an increase in number represented an increase in smoking frequency. I also started the “scale” at zero where zero represented individuals that do not smoke. I created a new variable that was solely a frequency scale of smoking from smoking ‘less than once a week’ to smoking ‘everyday’ (took out the ‘don’t smoke’ group). I then ran bivariate models by regressing each of my independent variables with the original measure of smoking frequency (including the non-smoking group) and then ran bivariate models with the same variables and the new frequency of smoking variable I created. I determined that no significant results were produced with the new variable that actually measured smoking frequency. However, significant results were produced when the measure with the non-smoking group was part of the scale. Based on these results, I determined that the effects of frequency of smoking were not actual effects on frequency of smoking but rather effects on determining the likelihood of adolescents that smoke or don’t smoke at present. Therefore, in this project I use a dichotomous of smoking at present. I recoded this variable to 0– don’t smoke, 1– smoke.

2. This was originally a continuous composite scale of frequency of alcohol usage. This scale was from 0 through 4, where 0 represented never having any alcohol at present. This project was not interested in the type of alcohol adolescents were drinking but how often adolescents were drinking any type of alcohol. Similar to what is done in other research using the HBSC (Zaborskis, Sumskas, Maser & Pudule, 2006) a maximum frequency scale was created where an individual receives a score based on the highest frequency of consumption of any type of alcohol type. However, similar to the procedures followed for the smoking measure I found that the effects of socio-demographic variables on drinking were not effects on frequency of drinking any type of alcohol but rather effects on whether adolescents drink any type of alcohol vs. not drinking any alcohol at present. Therefore, I collapsed my maximum frequency scale to a dichotomous scale where 0 represents adolescents that do not drink alcohol and 1 represents adolescents that drink any kind of alcohol at present.
Appendix B: Supplementary Regression Results

Table B.1: The effects of socio-demographic variables on school work pressure. OLS regression results from the Health Behaviour in School Aged Children 2006 Survey, Canada and Finland\textsuperscript{ab}.

<table>
<thead>
<tr>
<th>Socio-demographics</th>
<th>Canada</th>
<th>Finland</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>-0.088***</td>
<td>-0.121***</td>
</tr>
<tr>
<td>Age</td>
<td>0.105***</td>
<td>0.069***</td>
</tr>
<tr>
<td>Female\textsuperscript{c}</td>
<td>0.049</td>
<td>0.007</td>
</tr>
<tr>
<td>Family Arrangement\textsuperscript{d}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lone mother</td>
<td>0.011</td>
<td>0.064*</td>
</tr>
<tr>
<td>lone father</td>
<td>-0.048</td>
<td>0.198**</td>
</tr>
<tr>
<td>mother/stepfather</td>
<td>-0.034</td>
<td>-0.140</td>
</tr>
<tr>
<td>father/stepmother</td>
<td>0.046</td>
<td>-0.066</td>
</tr>
<tr>
<td>other</td>
<td>0.062</td>
<td>0.163*</td>
</tr>
<tr>
<td>N</td>
<td>5551</td>
<td>5042</td>
</tr>
<tr>
<td>R\textsuperscript{2}</td>
<td>0.0407</td>
<td>0.0506</td>
</tr>
</tbody>
</table>

Notes:

a. p<0.05*, p<0.01**, p<0.001***
b. Unstandardized coefficients shown.
c. Reference group=male
d. Reference group=living with both biological parents
Table B.2: The effects of socio-demographic variables and school work pressure on depressive symptomology. OLS regression results from the Health Behaviour in School Aged Children 2006 Survey, Canada and Finland (Standardized Coefficients)

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
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<td>Finland</td>
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<td>Sociodemographics</td>
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<tr>
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<td>0.055</td>
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<tr>
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<td>0.109</td>
<td>0.128</td>
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<tr>
<td>Family Arrangement(^b)</td>
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</tr>
<tr>
<td>lone mother</td>
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<td>0.026</td>
<td>0.054</td>
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</tr>
<tr>
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<td>0.018</td>
<td>-0.000</td>
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<tr>
<td>mother + stepfather</td>
<td>0.064</td>
<td>0.017</td>
<td>0.069</td>
<td>0.034</td>
</tr>
<tr>
<td>father + stepmother</td>
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<tr>
<td>other</td>
<td>0.041</td>
<td>0.049</td>
<td>0.038</td>
<td>0.037</td>
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<td>Focal Independent</td>
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<td>0.200</td>
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<td>-0.096</td>
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<td>-0.088</td>
<td>-0.044</td>
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<td>5082</td>
<td>5491</td>
<td>5009</td>
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<tr>
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<td>0.0669</td>
<td>0.1420</td>
<td>0.1655</td>
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</tbody>
</table>

Notes:

a. Reference group=male
b. Reference group=living with both biological parents