Multi-level Analysis of Student and School Level Characteristics Associated with Bullying Victimization in Ontario High School Students

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Courtney Betts

Abstract

Introduction: Bullying is a subtype of aggressive behaviour that is repeated over a prolonged period of time, includes an intention to cause harm, and occurs in the context of a real or perceived power imbalance. Research has consistently found four distinct subgroups of bullying involvement – victims, bullies, bully-victims, and bystanders, as well as four different types of bullying – physical, verbal, relational and cyberbullying. Overall, bullying affects the psychological and physical health of all those involved.

Literature Review: Prevalence rates vary widely across studies. Student level characteristics, including grade level, gender, race, disposable income, tobacco, alcohol and drug use, academic achievement, and weight status are consistently associated with bullying behaviour. School level characteristics have not been widely studied as predictors of bullying behaviour, but are expected to be associated.

Research Objectives: This study addresses four research questions. The study determines the prevalence of physical, verbal, and cyberbullying victimization reported by high school students, and whether prevalence varies across schools. School and student characteristics that predict the prevalence of physical, verbal and cyberbullying are determined.

Methods: This study uses cross-sectional data collected from the COMPASS study. COMPASS collects student level data with the COMPASS questionnaire, which has bullying questions adapted from the Ontario Student Drug Use and Health Survey. In COMPASS' baseline data collection, the student questionnaire was distributed to a convenience sample of 24 173 high school students in grades 9 through 12. School level data were collected by COMPASS from 43 Ontario schools using the study's School Policies and Practices Questionnaire. The present study's outcome measures consisted of grouping students by whether they respond "Yes" or "No" to being victimized by physical, verbal and cyberbullying. Student and school level predictor variables and how they were measured are also discussed. Descriptive statistics were reported for overall prevalence, as well as how often and in what way students were involved in bullying. Multi-level analysis was used to account for the nesting of students within schools. The prevalence of physical, verbal and cyberbullying was determined. Three intra-class correlations were calculated to determine the variance in student bullying due to differences across schools. Various student and school level models were performed to determine which factors predict bullying behaviour, for each type of bullying.

Results: Descriptive statistics for student and school level characteristics were reported. The prevalence of physical, verbal and cyberbullying victimization were found to be 27, 156, and 52 cases per 1000 individuals, respectively. Three ICC values were calculated to determine that school-level differences accounted for 2.6%, 1.4%, and 3.0% of the variability in the odds of a student being physically, verbally, and cyberbullied versus not, respectively. One school level univariate analysis was significant; students in large schools were less likely to be physically bullied compared to students in small schools. Students in grades 9 or 10, who used marijuana, and had low academic achievement had an increased likelihood of being victims of any three types of bullying. Students of other races, who used tobacco, and were underweight were also more likely to be physically bullied, while female students were less likely to be physically bullied. Students in grade 11, who were females, drank alcohol and were overweight were also more likely to be verbally bullied, while other ethnic groups were less likely. Finally, students who were female, used tobacco, drank alcohol and were underweight were also more likely to be cyberbullied. Five significant interactions were found between gender and other variables.
Discussion: This study found that bullying behaviour was a substantial problem; almost one in four students were involved in bullying. Verbal bullying was the most commonly experienced type of bullying, followed by cyber and physical bullying. This study is the first to identify that the school a student in grade 9 to 12 attends is independently associated with his/her risk of being bullied. Interestingly, none of the school-level characteristics examined were able to explain a significant amount of the variability identified in bullying, suggesting that additional research is required. Some student level characteristics associated with bullying behaviour were expected, but some surprising results are discussed. While this study uses cross-sectional data, the COMPASS study uses longitudinal data that will allow for causal inferences to be determined in coming years. This study uses self-report questionnaires, which are subject to various biases; however, questionnaires are also the method of choice for studies involving bullying. The study does not include a representative sample of Ontario high school students, although the sample is large and diverse. Future research should focus on characteristics that predict which students are bullies, and involved in relational bullying. The results in this thesis can inform school based bullying prevention and practice, specifically by targeted approaches that focus on those most likely to be bullied by their peers.

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Wouldn't life be better if everyone got along?
Wouldn't life be better if nothing ever went wrong?
Nobody crying, nobody feeling like they didn't belong.
Unfortunately this is not the case, our world today is a disgrace.
Bullies pushing and hurting kids in school, just because they think they're cool
We need to stop being mean, if you see a bully you should intervene!
It is so much more rewarding to put a smile on someone's face,
and help make our school a better place.
Take someone's hand when they've fallen to the ground,
because it is peace that makes our world go round.
Make sure you are nice to every boy and girl,
because by starting with a peaceful playground,
we can make a peaceful world.

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1.0 Introduction and Overview

The topic of bullying did not become a focus of research until the 1970s (Carrera *et al*, 2011). A strong interest in bullying first began in Sweden, by the term "mobbing" (Olweus, 2013). Dan Olweus introduced and defined the term "bullying", and continues to be the leading expert in bullying research today (Chapell *et al,* 2006). In the 20-year time span from 1980 to 2000, there were fewer than 200 peer-reviewed articles published on bullying. Bullying research has since gained the attention of researchers worldwide, and there have been well over 600 articles published on this topic from 2000 to present (Cook *et al,* 2010). Bullying has been observed in every society, which suggests that it is not unique to specific cultures (Cook *et al*, 2010; Volk *et al*, 2012).

Recently, school bullying has gained attention among the media, school authorities, and parents concerned about students' well-being and safety. School bullying is now thought of as a major social problem and public health issue that can lead to serious and lasting harm (CCL, 2008; Craig & Pepler, 2003; Hong & Espelage, 2012). Media stories covering the most serious consequences of bullying, including suicides and school shootings, are now more commonplace. The coverage of these serious consequences may provide the incorrect impression that bullying is a new phenomenon. However, there has only been an increase in consensus that peer abuse in schools is a serious problem (Carrera *et al*, 2011).

1.1 Definition of Bullying

The terms "aggression" and "bullying" are often used interchangeably; however, a number of researchers have explained clearly how they differ from one another. Peer aggression is defined typically as intentional negative behaviour directed at another peer (Carrera *et al*, 2011). Bullying is a special subset of aggressive behaviour, by an individual or group, to one or more other individuals, that must include certain features (Carrera *et al*, 2011; CCL, 2008; Casas *et al*, 2013; Hinduja & Patchin, 2013; Lipman, 2003; Liu & Graves, 2011; Litwiller & Brausch, 2013; Moon *et al*, 2011; Nansel *et al,* 2001; Public Safety Canada, 2008):

1. Bullying behaviour includes **intent to cause harm** or disturb the victim (Liu & Graves, 2011), as opposed to behaviours harmless in intent, such as teasing and rough and tumble play. Some researchers have raised concerns about the use of intentionality as a

criterion of bullying, as it can be difficult to know if one intends to harm another person (Olweus, 2013). This issue leads into the second criterion.

2. Bullying behaviour is **repeated over a prolonged period of time**. The reason repetitiveness was introduced as a criterion was to be more certain that the negative behaviour is intended. However, repetitiveness is not an absolutely necessary criterion (Olweus, 2013). A single, serious incident of abuse can occasionally and legitimately be defined as bullying (Carrera *et al*, 2011).
3. Bullying occurs within the context of a **real or perceived power imbalance** and is a systematic abuse of power between the perpetrator and the victim, with a more powerful person (or group) attacking a less powerful one who cannot easily defend him or herself (Liu & Graves, 2011; Vervoort & Scholte, 2010). The power imbalance can be physical, in which the perpetrator is bigger than the victim (Kowalski *et al*, 2012), or social, in that the perpetrator is more socially influential than the victim (Leff & Waasdorp, 2013; Liu & Graves, 2011). It is not considered bullying when two youth of similar psychological and physical strength are fighting (Mamun *et al*, 2012).

Overall, the World Health Organization (WHO) (2002) recognizes bullying behaviour as the intentional use of physical and psychological force of power, threatened or actual, against oneself, another person, or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development, or deprivation.

The Government of Ontario (2011) defines bullying as, "the severe or repeated use by one or more pupils of a written, verbal, electronic or other form of expression, a physical act or gesture or any combination of them if it is directed at another pupil and if it has the effect of or is reasonably intended to have the effect of,

- Causing physical or emotional harm to the other pupil or damage to the other pupil's property,
- placing the other pupil in reasonable fear of harm to himself or herself or damage to his or her property,
- creating a hostile environment at school for the other pupil,
- infringing on the legal rights of the other pupil at school, or
- materially and substantially disrupting the education process or the orderly operation of a school; ("intimidation")".

1.2 Bullying Involvement

Research has consistently found four distinct bullying subgroups – victims, bullies, bully-victims, and bystanders (Goldweber *et al*, 2013).

Victims: In general, victims are described as younger, shorter and weaker than their peers. Victims are often socially disadvantaged, overweight, physically unattractive, or wearing a different style of clothing (Carrera *et al*, 2011). Victims have been divided into two categories. The passive, submissive, or classical victim is the most commonly identified victim, and is characterized by reactions of anxiety and physical weakness. The second type of victim, known as the provocative victim, combines the anxiety reaction with an aggressive response towards others. Researchers also refer to the provocative victims as aggressive victims or bully-victims, which are described in further detail below.

Bully-Victims: Recent studies suggest that some youth are neither pure "bullies" nor pure "victims" and may exist along a bully-victim continuum (Cook *et al*, 2010; Hong & Espelage, 2012). The bully-victim has been increasingly recognized as a separate category, but is also referred to as the "aggressive" or "provocative" victim. The defining feature of the bully-victim is participation in bullying situations as perpetrator and as victim (Carrera *et al*, 2011).

Bullies: Overall, bullies are not a homogenous group. Bullies can be divided into "active" and "passive" (or "anxious") abusers, who differ in their functioning and how often they participate in bullying behaviour (Reijntjes *et al*, 2013). The active abuser personally harasses the victim, directs the abuse situation, and manipulates other members of the group into supporting these behaviours. The passive or anxious bully is a follower rather than a leader, one who participates in bullying incidents in response to a manipulation of an active leader (Carrera *et al*, 2011).

Bystanders: Research has highlighted that bullying is a group phenomenon, rather than an individual phenomenon involving only the bully and the victim (Strom *et al*, 2013). Bystanders have begun to receive more attention in research over the previous decade. Bystanders are viewers, observers, witnesses or passerbys. The role of spectators is crucial; those who observe bullying can be intimidated, can create support for bullying by excusing, accommodating, or even encouraging the bully, or can try bullying themselves (Carrera *et al*, 2011; Ontario, 2011).

1.3 Bullying Types

Bullying can be classified as "overt" or "covert". Overt bullying includes physical and verbal types of bullying, that include confrontational behaviour directed towards another individual or group of individuals (Hong & Espelage, 2012). Covert bullying is a type of behaviour that occurs in a more secretive manner (Fox & Farrow, 2009; Hong & Espelage, 2012). The types of bullying include: physical, verbal, relational or cyber (CCL, 2008; Liu & Graves, 2011; Wang *et al*, 2009). The COMPASS study, discussed in more detail below, measures physical, verbal and cyberbullying.

Physical Bullying: Physical bullying may be the most easily observed type, as it is done through physically dominant behaviours, including assault, hitting, punching, kicking, pushing, tripping, and forced confinement (CCL, 2008; Liu & Graves, 2011; Wang *et al*, 2009).

Verbal Bullying: Verbal bullying involves dominant behaviours through spoken acts, including threats, slander, insults, name calling, verbal intimidation, and mocking (CCL, 2008; Liu & Graves, 2011; Wang *et al*, 2009).

Relational Bullying: Relational bullying is also referred to as social or psychological bullying. This is a subtler form of bullying that intends to harm by damaging the victim's relationships with others, or impairing the victim's ability to maintain a social reputation. This may involve spreading rumours about the victim, socially excluding the victim, or threatening to withdraw friendship (Beran *et al*, 2012; CCL, 2008; Leff & Waasdorp, 2013; Liu & Graves, 2011; Wang *et al*, 2009).

Cyberbullying: Cyberbullying, also called "electronic bullying", can be similar to other types of bullying but occurs on the Internet through computer technology, such as instant messaging, emails, chat rooms, websites, online games, social networking sites, and text messaging (Kowalski & Limber, 2013). Cyberbullying covers a range of behaviours that are intended to harm others through the use of electronic media, including "flaming" (electronic messages containing hostile or vulgar language), slandering (online disparagement, including sending cruel pictures or rumours), impersonation (hacking into someone's account and sending out messages to damage someone's reputation), defamation (sending out false rumours), and cyber harassment (sending out threatening messages) (Beran *et al*, 2012; CCL, 2008; Casas *et al*, 2013; Leff & Waasdorp, 2013; Liu & Graves, 2011; Wang *et al*, 2009). Cyberbullying is

relatively new, as computers and cell phones have become more popular among adolescents (Wang *et al*, 2009).

Several differences between cyberbullying and traditional bullying have been identified. Cyberbullying is perceived as different from other types of bullying by victims, it is also more likely to occur outside of school, more difficult to avoid, and it can be anonymous (Casas *et al*, 2013; Litwiller & Brausch, 2013). It can be especially harmful because once it is committed it is difficult to remove messages from cyberspace, and it can be translated quickly and impulsively to much larger audiences than traditional bullying (Leff & Waasdorp, 2013). In addition, perpetrators may feel less responsibility and accountability when online compared with face-to-face situations (Schneider *et al*, 2012).

Given these differences, researchers have discrepant views about the relationship between traditional bullying and cyberbullying. Some have suggested that cyberbullying is merely a continuation of traditional bullying through new means. Others have noted that cyberbullying differs in some important aspects and suggest that although they may share some common features, cyberbullying and traditional bullying are different phenomena perpetrated by different groups of individuals (Kowalski & Limber, 2013). Olweus (2012 & 2013) argues that claims about cyberbullying are often greatly exaggerated and have very little scientific support. Some have claimed that given the steady increase in the use of electronic media by youth, bullying has become more prevalent (Beran *et al*, 2012). However, Olweus (2013) states that no systematic change in prevalence has occurred over the time periods studied. Another common claim is that the new form of cyberbullying has created many new victims and perpetrators. This claim is based on an assumption that children and youth who are involved in cyberbullying are to a considerable degree different from those engaged in traditional bullying. When this claim was checked empirically, the results document a very high degree of overlap: of students who had been exposed to cyberbullying, 88% had been bullied in at least one traditional way. About 10% of the participants had only been cyberbullied, which suggests that the new computer technology has actually created few new victims and bullies. These results also suggest that even if most cyberbullying actually occurs outside school hours, the majority of episodes of cyberbullying originate in the school setting (Olweus, 2012; Olweus, 2013).

1.4 Impact on Health

Previous research indicates that school bullying is a global phenomenon that has damaging psychological and physical effects on victims and bullies alike (Moon *et al*, 2011). The majority of research has been conducted on the health effects of victims. However, there is research that suggests the consequences on health can differ for victims, bullies and bully-victims. Thus, each one will be discussed in turn below.

Victims

A significant number of studies have been conducted in multiple countries to examine the psychological and physical harm to victims (Moon *et al*, 2011). Previous findings from longitudinal and cross-sectional studies have shown that each type of bullying (i.e. physical, verbal, relational and cyber) can increase the risk of a victimized adolescent experiencing harmful thoughts or behaviours (Litwiller & Brausch, 2013). Currently in Ontario, 18% of students express worry about being harmed or threatened at school. This percentage is significantly higher today; previous rates have been about 12 to 14% of students reporting worry (Paglia-Boak *et al,* 2012).

Psychological health outcomes

Mental health and well-being are largely dependent on perceptions of belonging and connection. The act of bullying someone rejects the person targeted and disrupts feelings of belonging and connection. Thus, being a victim of harassment has significant mental health consequences (Beran *et al*, 2012). Those who are bullied often have low psychological well-being. This includes states of mind that are generally considered unpleasant but are not severely distressing, such as general unhappiness, low self-esteem and insecurity, and feelings of anger or sadness. Currently in Ontario, 3% of students reported that they had low self-esteem, with females being more likely to report this over males (Paglia-Boak *et al,* 2012). Youth also face poor social adjustment; this normally includes feelings of aversion towards one's social environment, evident through expressed dislike for school, loneliness, isolation and absenteeism (Leff & Waasdorp, 2013; Rigby, 2003; Seals & Young, 2003).

More seriously, those who are bullied can experience psychological distress, including high levels of depressive or anxious symptoms (Haynie & Nansel, 2001; Litwiller & Brausch, 2013; Rigby, 2003). In a study by Mitchell *et al* (2007), all types of bullying were related to depression, and bullied students were 2.5 times as likely to experience depression (Mitchell *et*

al, 2007). Compared to non-bullied students, victims of bullying were 1.7 to 7.5 times as likely to experience psychological symptoms such as loneliness, nervousness, petulance, and helplessness (CCL, 2008). One third of Ontario students in grade 7 to 12 indicated that they had elevated psychological distress, including depression, anxiety, and social dysfunction (Paglia-Boak *et al,* 2012). Interestingly, other researchers have examined depression and anxiety as predictors of bullying victimization. They theorize that depressed or anxious behaviours could make the victim an easy target for bullying, as they appear to be more vulnerable than those without depression or anxiety, and the perpetrators may fear less retaliation from these victims (Hong & Espelage, 2012; Kowalski & Limber, 2013).

Physical health outcomes

Victims of bullying can experience medically diagnosed physical health outcomes. Those who are bullied have increased medicine use and injuries (Wang *et al*, 2010). Psychosomatic symptoms, which are symptoms that have no physical cause to explain them, are also common in those being bullied (Hansen *et al*, 2012). Psychosomatic symptoms can include headaches, stomachaches, poor appetite, mouth sores, thumping in the chest or palpitation, muscle pain, breathing problems, and dizziness (Hansen *et al*, 2012; Rigby, 2003). Because students are often bullied at school, these symptoms often develop in the morning (Hansen *et al*, 2012). Students who are bullied on a weekly basis are almost twice as likely to experience psychosomatic symptoms, as compared to their non-bullied peers (CCL, 2008).

The most serious consequences that rejection from peers can generate include suicide or homicide (often through school shootings). For youth aged 0 to 24, suicide ranks as the third leading cause of death. One in ten Ontario students in grades 7 to 12 had serious thoughts about suicide in the previous 12 months, with 3%, an estimated 28 000 students, reporting a suicide attempt in the same time frame (Paglia-Boak *et al,* 2012). Bullying is an environmental stress that substantially increases an adolescent's suicide risk (Litwiller & Brausch, 2013). Furthermore, victims of bullying are eight times as likely to carry a weapon to school (Leff & Waasdorp, 2013). A reported 5% of students in Ontario report carrying a weapon, with males being more likely than females (Paglia-Boak *et al,* 2012). The victims of bullying often require mental health assistance, special education programs and other social services (CCL, 2008).

Long-Term Consequences

Repeated bullying by those who are physically or socially more powerful can have very negative and permanent effects lasting into adulthood (Seals & Young, 2003). Long-term effects of bullying include difficulty with interpersonal and romantic relationships, higher rates of unemployment, and higher rates of criminality (Lemstra *et al*, 2011). Victims who are bullied in school often continue to be bullied in the workplace (Cook *et al*, 2010). The pervasive and long lasting effects on youth tend to vary as a function of their pattern of involvement in bullying, such as how often they are bullied (Bradshaw & Waasdorp, 2013). The utmost victim of bullying is society, as bullying carries a steep social and economic cost (CCL, 2008). Victims are over consumers of society's health and social support systems, due to factors such as long sick leaves, unemployment, and early pensioning (Olweus, 2013).

Bullies

While much attention has been given to the impact on victims, there is also substantial evidence that bullies themselves are vulnerable to a host of negative outcomes affecting their well being and social functioning throughout adolescence and into adulthood (Liu & Graves, 2011). Research suggests that bullies have the most serious behavioural and mental health problems (Bradshaw & Waasdorp, 2013; Liu & Graves, 2011). Bullies do not often have low self-esteem, but are often more depressed than victims (Seals & Young, 2003). Involvement in bullying is associated with an increased risk of two or more co-occurring mental disorders, including depression, anxiety, excessive drinking and use of substances other than alcohol (CCL, 2008). Engaging in different types of bullying behaviour has similar outcomes. Relational and physical aggressors demonstrate many of the same deficits, including peer relationship difficulties, problem-solving deficits, and increased risk for drug use and academic struggles. Showing both physical and relational aggression increases the likelihood of having concurrent and future psychosocial maladjustment, such as depression and suicidality (Leff & Waasdorp, 2013). Bullies are also more likely to engage in antisocial and criminal behaviours in their adolescence and adulthood. In a study by Moon *et al* (2011), 60% of bullies were found to have a history of at least one conviction in their 20s, and approximately 40% of those convicted had a history of multiple convictions. Frequent bullying is associated with a high risk for later suicidal behaviour and domestic violence (Liu & Graves, 2011). Those who are bullies in school are very likely to bully their spouses and children later, continuing a cycle of

domestic violence and creates new generations of aggressive children (Ma, 2001). Furthermore, bullies are also over consumers of society's health and social support systems, like victims (Olweus, 2013).

Bully-Victims

As bully-victims are involved in bullying others as well as being victims to others, they consequently experience the negative health effects of both victims and bullies. Suitably, there is research suggesting that bully-victims fare worse than those youth who are just victimized or who just bully (Goldweber *et al*, 2013; Wang *et al*, 2011). Bully-victims are classified as being hyperactive, depressed and having lower school competence (Haynie & Nansel, 2001). They often encounter problems in relationships with peers, parents and teachers. They also tend to remain involved in bullying for a longer period of time (Solberg *et al*, 2007).

1.5 Bullying Prevention and Interventions

There is an emerging consensus among the bullying prevention literature that the "whole school approach" is an effective and lasting approach to prevent bullying in schools. Successful approaches generally exhibit key principles, such as supporting both students who bully and students who are bullied, promoting strong teacher and adult leadership and strong student-teacher bonding (Public Safety Canada, 2008; Safe Schools Action Team, 2005). School policies on bullying should include a clear definition of bullying and instructions on how to embed bullying prevention into the curriculum. Clear and consistent behavioural norms should be put into place, as problematic behaviours are decreased when they are consistently identified and swiftly reprimanded with the use of positive and negative consequences. Schools should also have effective supervision that is focused on problem areas where bullying frequently takes place, such as during lunch hour (Public Safety Canada, 2008; Safe Schools Action Team, 2005).

It is important to involve multiple stakeholders, such as students, teachers, administrators, support staff, parents and other community members, in bullying prevention. The involvement of multiple stakeholders allows groups with different expertise to interact and foster innovative approaches, share resources, and disseminate information to larger audiences. Engaging adults in the students' lives, both at home and at school, ensures that adults have the information they need to take consistent and appropriate action when responding to bullying. Furthermore, students should be involved in program development and delivery. Student

involvement ensures the program will be relevant and the message will be communicated in a meaningful way. Some methods include: regular class meetings to discuss bullying, the development and adherence to class rules, and activities focused on understanding the harm of bullying (Public Safety Canada, 2008; Safe Schools Action Team, 2005).

Research has shown that successful interventions target multiple risk and protective factors at various levels, such as the individual, family, peer group, school and community level, as there is no single cause for bullying. Successful interventions focus on early, long-term intervention and are gender and age specific. The Safe Schools Action Team of Ontario (2005) also outlined the intervention approaches that do not work as well. The least successful bullying prevention programs do not have different intervention strategies for students at different levels of risk (they only provide programming targeted at the entire school population). Furthermore, individually focused programs, situational deterrents, zero tolerance policies and school expulsion are not very effective on their own. Unsuccessful interventions are also less likely to have been evaluated.

The Safe Schools Action Team (2005) found that successful bullying interventions included four key components:

- **Education** to develop a deeper awareness and understanding of bullying that helps foster prevention.
- **Assessment** to determine the extent and nature of bullying, perceptions around the issue, and the effectiveness of prevention efforts.
- **Action** to provide identification and prevention strategies for the whole school community and targeted interventions for students that address:
    - School-wide education, embedded in the curriculum, for the entire school population
    - Routine interventions targeted for students involved in the early stages of bullying
    - Intensive intervention strategies for those involved in repeated bullying and victimization, with possible referral to community/social service resources
- **Policy** to establish the framework within which bullying prevention in the school is defined, prioritized, implemented, and evaluated.

In Ontario in September of 2012, Bill 14, an Act that amends the Education Act, came into force. This Act stated that one week each year would be Bullying Awareness and Prevention Week in schools. Furthermore, the bill deals with bullying that occurs in schools, a public property within 50km of a school site, during an activity conducted for a school purpose, through the use of technology provided to students by a school, or through any technology if it

affects the orderly operation of a school. The school board is required to provide instruction on bullying prevention, programs for victims and bullies, development of programs for teachers, and information for the public. Those who work in a school are now required to report to the principal any acts of bullying observed. The principal must then conduct an investigation and are required to take specific action outlined in the bill if a case of bullying has occurred (Ontario, 2012).

1.6 Purpose

The purpose of this study was to examine the prevalence of bullying. Furthermore, the degree to which student level characteristics (grade level, gender, race, tobacco, alcohol and drug use, academic achievement and weight status) and school level characteristics (school size, urban or rural status, and school policies) are associated with whether students will be involved in physical, verbal and cyberbullying. If the characteristics that either predispose or protect students from bullying could be better understood, it is possible to implement prevention or intervention strategies in the school to prevent negative health outcomes from occurring (Bohn, 2011).

2.0 Literature Review

2.1 Search Strategy

To discuss bullying, previous research was found using the databases Web of Science, PubMed and Google Scholar (2000 to present and in English). Keywords from this topic included "bullying", "peer victimization", and "peer abuse". The search was limited to samples that included only high school or middle school students. Studies involving students younger than adolescence were not included. Studies conducted in Canada were preferable, however since these were less common, data from the United States and Europe were also used. Separate literature searches were conducted for the association of bullying with each separate topic, including prevalence, student level characteristics, such as grade level, gender, race, smoking, alcohol and drug use, academic achievement, and weight status, and school level characteristics, such as school size, and rural and urban status.

2.2 Prevalence of Bullying

School bullying has been studied extensively in internationally and culturally different settings. Although there is agreement on some common elements that describe school-based bullying, there is no definition globally agreed upon (Carrera *et al*, 2011; Moon *et al*, 2011). The wide range of varying factors complicates the comparison of prevalence and correlates across studies (Leff & Waasdorp, 2013; Moon *et al*, 2011; Schneider *et al*, 2012). It is clear that many youth are affected regularly within schools; however, it is not known whether the prevalence of bullying for different places and times actually vary or if it is due to different definitions and methods (Hong & Espelage, 2012; Leff & Waasdorp, 2013; Moon *et al*, 2011; Vervoort & Scholte, 2010).

Comparisons of bullying prevalence rates across studies are difficult for several reasons. First, a "period prevalence" estimate refers to the proportion or percentage of students in a school who have been exposed to bullying with some defined frequency within a specific time period. Poor adherence to the basic meaning of the concept of prevalence in this area is a major reason for the considerable variability in estimates presented in the literature (Solberg & Olweus, 2003). Second, studies reporting prevalence rates of bullying have relied on different data sources, such as self reports (questionnaires and interviews), peer nominations, reports from other people (parents and teachers) and direct observation. Some data sources are less well suited for prevalence estimation than others (Solberg & Olweus, 2003). One likely reason for discrepancies between different data

sources is the fact that a good deal of bullying is subtle and somewhat secretive, which may be difficult for peers to observe but is clearly perceived by the victimized student (Olweus, 2013). Self-reports are the most commonly used method for addressing the prevalence of bullying in part because of their efficiency and minimal cost. However, there is limited information regarding the reliability and validity of self-report measures of victimization. In addition, the issue of social desirability is a common concern with self-reports, as it increases underreporting of involvement in bullying (Sawyer *et al,* 2008).

Third, some researchers provide their participants with a definition or explanation of what is meant by bullying, while others do not. Without a clear definition, the individual participant who is to respond is given more room for subjective interpretation of what is meant by bullying, which will increase variability. It remains unclear whether respondents are able to effectively discriminate between bullying and other aggressive acts (Solberg & Olweus, 2003). For instance, some research suggests that when examples of bullying are given that include repetition and power imbalance, youth do not always take these factors into account (Leff & Waasdorp, 2013; Moon *et al*, 2011; Schneider *et al*, 2012). Providing behavioural descriptions, as opposed to a definition, is often endorsed by researchers who feel that the respondents are less likely to self-report accurately when asked about bullying as opposed to endorsing specific actions that comprise bullying (Solberg & Olweus, 2003). Fourth, studies may differ with regard to the reference period or time frame used in measuring bullying. The time period referred to can, for example, be a whole school year, one school term or the previous two or three months. In other studies, prevalence estimates only refer to the current situation, or no information at all is provided about the time period that the participants should relate their assessment to (Solberg & Olweus, 2003).

Fifth, response and rating categories may vary in both number and specificity. Such categories may consist of simple yes-no dichotomies, or various applicability categories such as "does not apply at all" or "applies exactly" or of relatively vague frequency alternatives varying from "seldom" to "very often" or from more specific temporal categories such as "not at all in the previous couple of months" to "several times a week". Choice of cutoff point has a large effect on the prevalence rates. Studies which use the category "once or twice" as a lower bound cutoff point tend to get prevalence estimates of about 20 to 30% whereas studies with stricter criteria like "two or three times a month" and "once a week" report mainly prevalence rates below 5% (Solberg *et al*,

2007). Sixth, some studies base their prevalence estimates on a single item/variable, whereas others use a composite score or scale. There are some problems associated with use of composite or scale scores for prevalence estimation. Finally, studies use different thresholds or criteria for differentiating victims from non-victims and bullies from non-bullies (Solberg & Olweus, 2003). It was argued that from the perspective of interpretability or meaning and reproducibility, use of a questionnaire with a single (self-report) variable item with quite specific response alternatives might be the method of choice. Questionnaires are best when students anonymously complete them, and they include a detailed definition or explanation of bullying, a clear time frame or reference period, and a natural and not too long memory unit for the students (Solberg & Olweus, 2003).

2.2.1 Overall Prevalence

Most researchers agree that prevalence measures of bullying range widely from approximately 5 to 60% of students (Beran *et al*, 2012; Hansen *et al*, 2012; Volk *et al*, 2012). Of adolescents, 75% have been bullied at least once during their school years (Haynie & Nansel, 2001). Compared to 35 countries, Canada has the 9th highest rate of bullying among 13 year olds (CCL, 2008).

2.2.2 Prevalence of Different Involvements in Bullying

Prevalence of different involvements in bullying varies. In a study by Seals & Young (2003), 24% reported direct involvement in bullying. Of these, 10% bullied others one or more times per week, 13% were victimized, and 1% both were bullied and bullied others. Hong & Espelage (2012) and Wang *et al* (2009) found similar results. In Hong & Espelage's (2012) study 9% reported frequent victimization, and 13% reported bullying others. In Wang *et al*'s (2009) study, prevalence of frequent involvement in bullying in the previous two months was 29.9%, which included 13% as bullies, 10% as victims and 6.3% as both. Bradshaw & Waasdorp (2013) and Kowalski & Limber (2013) found slightly higher results. Bradshaw & Waasdorp (2013) reported that 41% of students were frequently involved in bullying (Two or more times in the previous month) with 23% as victims, 8% as bullies, and 9% as bully-victims. Kowalski & Limber (2013) found that 15% reported being bullied at school at least once within the previous two months, 17% bullied others, 19% reported bullying others and being bullied, and 49% were not involved with bullying. Researchers studying bullying among Canadian students found that 2 to 8% of students reported being bullied at least once a month. Between 4 and 10% indicated that they bullied others at least once a month, while 19 to 24% of students report being both a victim and a bully (CCL,

2008). Specifically in Ontario, 29% of students reported being bullied in school in the previous school year. Furthermore, 21% reported bullying others in the same time frame, a rate that has significantly declined from 30% of students since 2003 (Paglia-Boak *et al,* 2012).

2.2.3 Prevalence of Different Types of Bullying

Previous studies have shown that prevalence of verbal and relational victimization are higher than physical and cyber victimization (CCL, 2008; Wang *et al*, 2010). Traditional bullying is also much more prevalent than cyberbullying, and a great deal of cyberbullied students are also bullied in traditional ways (Olweus, 2013). The prevalence of each type of bullying will be discussed.

Physical Bullying

Physical bullying rates reported in studies vary widely. In a study by Wang *et al* (2009), it was reported that 13.3% of students had physically bullied others at least once in the previous two months. The prevalence rate of victimization in the previous two months was 12.8%. A year later, Wang *et al* (2010) found that being bullied at school at least once in the previous 2 months was reported at 20.8% for physical victimization. Another study by Wang *et al* (2010) found that the prevalence rate of involvement was 13.2% for physical bullying. This study also reported that for those involved in physical bullying, 38.9% were bullied only, 36% were victims only, and 26.3% were bully-victims. Wang *et al* (2011) found that 21.2% of students reported physical victimization. Moon *et al* (2011) reported that 17% of students in secondary schools engaged in physical bullying such as slapping, fist-fighting, hitting, and assaulting fellow students. Physical bullying had much higher rates in the studies by Litwiller & Brausch (2013), Seals & Young (2003) and Tharp-Taylor *et al* (2009), who reported physical victimization rates of 33%, 49% and 34%, respectively. In Ontario, only 3% of students report being physically bullied (Paglia-Boak *et al,* 2012).

Verbal Bullying

In a study by Wang *et al* (2009), it was found that 37.4% reported that they had bullied others at least once in the previous two months verbally, while the prevalence rate of victimization was 36.5%. In 2010, Wang *et al* (2010) found that being bullied at school at least once in the previous two months was reported at 53.6%. A further study by Wang *et al* (2010) found that the prevalence rate of involvement was 36.9% for verbal bullying. Of these students, 30.3% were bullies only, 31.7% were victims only, and 38.1% were bully-victims. In 2011, Wang *et al* (2011)

reported that verbal bullying was reported at 53.7% of respondents. In the study by Seals & Young (2003), threats of harm, name-calling, and mean teasing were reported at 65%, 44.3% and 53.7%, respectively. Tharp-Taylor *et al* (2009) reported that 51% experienced verbal bullying. Specifically in Ontario, 25% of students report being verbally bullied (Paglia-Boak *et al,* 2012).

Relational Bullying

Wang *et al* (2009) reported that 27.2% of respondents stated that they had socially bullied others at least once in the previous two months, while the prevalence rates of victimization were 41%. In 2010, it was found that being bullied at school at least once in the previous two months was reported at 51.4% (Wang *et al*, 2010). A further study by Wang *et al* (2010) found that the prevalence rate of involvement was 25.8% for social exclusion and 32.1% for rumour spreading. In 2011, Wang *et al* (2011) reported that the relational victimization rate was 51.6%. In the study by Seals & Young (2003), exclusion rates were seen to be 42.4%.

Cyberbullying

Canadian statistics found that 21% of students were victimized by cyberbullying, and about 3% of students were perpetrators (Beran *et al*, 2012; Paglia-Boak *et al,* 2012). Another Canadian study found that 35% reported that they have occasionally received inappropriate messages, while 3 to 7% often claim receipt of anomalous online communications. Almost 25% confirmed that occasionally someone else had used their online identity and pretended to be them, subsequently tarnishing their reputation. 25% also disclosed that other youth have posted sensitive, personal information about them on the Internet. 10 to 20% report being racially cyber bullied. One quarter of students reported that they have cyber bullied others online (Cassidy *et al*, 2009). The most common form of cyberbullying against youth was being the target of threatening or aggressive emails or instant messages, reported by 74% of adults who knew of a case of cyberbullying against a youth in their household. This was followed by hate comments received by email or instant messaging or posted on a website and having someone use the identity of the child to send threatening messages (Perreault, 2011).

2.3 Student Characteristics Involved in Bullying

In this section, various student level factors, such as grade, gender, race, tobacco, alcohol and drug use, academic achievement and weight status, and their involvement in bullying will be discussed. Additional demographic factors, including youth spending money,

are also predictive of bullying behaviour, such that youth who have less spending money are more likely to be bullied (Carrera *et al,* 2011). Decades of research has shown that student level characteristics are interconnected, correlated, and tend to co occur. Furthermore, interactions effects between factors are likely (Bradshaw & Waasdorp, 2013; Vervoort & Scholte, 2010). The accumulation of risk theory suggests that youth exposed to multiple risk factors may display increased involvement in bullying (Goldweber *et al*, 2013).

Grade Level

Grade level, as opposed to age, is discussed in this paper as high school administrators base policies and decisions for students on grade level. Overall, research has found that bullying peaks in middle school (or grade 9 of high school), and then declines afterwards (Carrera *et al*, 2011; Volk *et al*, 2012; Wang *et al*, 2009). Early adolescence is a critical period, in which youth explore their new social roles and their pursuit of status among their peer groups, which can motivate aggressive behaviour. Due to its higher prevalence in middle school, bullying and its association with grade level has not been widely studied in high school students (Hong & Espelage, 2012). In a study by Nocentini *et al* (2013), a relatively high stability of bullying involvement was found, which peaked during lower grade levels and declining slightly during higher grade levels. Liu & Graves (2011) also found increasing grade level to be a protective factor for bullying in schools and speculated that a decrease in prevalence of bullying behaviours occurs as youth become more familiar with one another in school.

Studies have found conflicting results; however, it is important to realize that both physically and relationally aggressive behaviours can be expressed somewhat differently across different grade levels. As students progress through high school, the aggressive acts are often more covert and complex. Physical aggression tends to decrease, while relational aggression tends to increase, as it is generally much less acceptable and there are clearer rules to being physically aggressive with peers (Bradshaw & Waasdorp, 2013; Leff & Waasdorp, 2013; Seals & Young, 2003). In terms of cyberbullying, some studies suggest that victimization increases during the middle school years and others have found no consistent relationship between cyberbullying and grade level (Schneider *et al*, 2012). According to Schneider *et al* (2012), although cyberbullying decreased slightly from 9th grade to 12th grade from 17.2% to 13.4%, school bullying decreased by nearly half (from 32.5% to 17.8%). In the study by Turner *et al*

(2013), cyberbullying had a slightly later peak, possibly due to the fact that younger students are more limited in their access to cyberbullying technology. In the Ontario Student Drug Use and Health Survey (OSDUHS), significant grade variation was found with students in grade 7 through 10 most likely to be bullied, and students in grade 12 least likely. However, there were no significant differences among grade for cyberbullying (Paglia-Boak *et al,* 2012).

Gender

The question of gender differences in bullying has been a growing area of focus over the previous two decades. Many studies report that males in general are more likely to engage in bullying and are more likely to be victimized than females (Beran *et al*, 2012; Goldweber *et al*, 2013; Nocentini *et al*, 2013; Hong & Espelage, 2012; Vervoort & Scholte, 2010). However, Canadian data suggests that females are more likely than males to report being bullied in any manner (Paglia-Boak *et al,* 2012). The literature consistently reports that male students are more likely to exhibit and self-report physical and direct forms of bullying, whereas female students engage more in verbal and relational forms of bullying (Hong & Espelage, 2012; Liu & Graves, 2011; Paglia-Boak *et al,* 2012; Seals & Young, 2003). Patterns of difference have been observed in cyberbullying as well; females are almost twice as likely to report being a victim (Paglia-Boak *et al,* 2012).

Ethnicity and Race

Ethnicity as a possible risk factor for bullying has not been widely studied. Youth of particular ethnic groups may be at high risk. However, research on the prevalence and nature of bullying among students of different ethnicities lacks consistency and accuracy, likely due in large part to cultural influences, which affect the way children perceive the concept of bullying (Gofin & Avitzour, 2012; Liu & Graves, 2011). A national survey indicated that ethnicity was not as significant as gender and grade level in predicting bullying (Seals & Young, 2003). There has been slightly more research conducted on bullying and race. In American studies, whites tend to be at significantly higher risk of victimization than African American and Hispanic/Latino youth. Hispanic/Latino youth report marginally higher involvement in bullying perpetration than whites, while African American reported higher levels than youth of all other races, but were less likely than Caucasian and Hispanic youth to be victimized (Hong & Espelage, 2012; Spriggs *et al*, 2007; Wang *et al*, 2009).

Contradictory findings in the literature may relate to racial differences in youths self reported victimization. For example, research demonstrated that prevalence estimates of victimization vary by assessment method. Specifically, victimized African American youth tended to under report being a victim of bullying when presented with a definition based response option. There is also a robust correlation such that older, African American males tend to be labeled, more than any other racial/ethnic group, as aggressive by teachers and peers. Thus, the issue of racial disproportionately complicates the bullying research and prevalence rates (Goldweber *et al*, 2013).

An interaction effect could occur between race and gender. The difference in victimization between males and females is smaller for ethnic minorities than for the ethnic majority group. Further, the interaction shows that ethnic majority males are more victimized than ethnic majority females, but that ethnic minority females are more victimized than ethnic minority males (Vervoort & Scholte, 2010).

Tobacco, Alcohol and Drug Use

Adolescence is a key developmental period for initiation into substance use. Experiences of bullying produce negative psychological states that increase the probability that an adolescent will engage in substance use. This view of alcohol use as a means to cope with negative affect is consistent with previous research related to the etiology of adolescent substance use. However, empirical evidence also supports the bully and substance use link (Litwiller & Brausch, 2013). Substance use has been found to relate to all patterns and types of bullying involvement in a variety of studies (Litwiller & Brausch, 2013; Tharp-Taylor *et al*, 2009; Torres *et al*, 2012)

In Litwiller & Brausch's (2013) study, physical bullying had significant and positive direct effects on substance use. Generally, the results revealed two types of bullying, cyber and physical bullying, which positively predicted substance use. Cyberbullying accounted for slightly more variance in this behaviour than physical bullying. In a study by Bradshaw & Waasdorp (2013), across all substance use outcomes, a pattern emerged such that bully-victims, bullies, and victims consistently exhibited a greater risk for substance use compared to youth with low levels of bullying involvement. Using low involvement adolescents as a reference group, the odds ratio was largest for bully-victims, followed by bullies and then victims (Bradshaw & Waasdorp, 2013).

In terms of alcohol use, bully-victims and bullies were about three times as likely to have used alcohol. However, there was no difference between victims and low involvement adolescents on alcohol use. A similar pattern of findings emerged for smoking compared to low involvement

adolescents; bully-victims were almost five times as likely, bullies were approximately 2.7 times as likely, and victims were more than 1.6 times as likely to have smoked cigarettes. Regarding marijuana use, bully-victims were 3.7 times as likely to use marijuana than the low involved students. Bullies were the next most likely substance users, as they were 2.7 times as likely to use marijuana than the low involved students. Victims were also more likely to use marijuana than low involved students. For prescription drug use, the odds ratio was over 8 for bully-victims, about 4 for bullies and over two for victims (Bradshaw & Waasdorp, 2013; Kuntsche *et al*, 2007; Mitchell *et al,* 2007; Radliff *et al,* 2012; Tharp-Taylor *et al*, 2009). The magnitude of this relationship was smaller in high school youth compared to middle school youth (Liu & Graves, 2011).

Academic Achievement

Students involved in bullying are more likely to have academic adjustment problems. Academic difficulties include low academic readiness, impaired concentration, reduced school marks, school failure, absenteeism or poor attendance, low bonding or negative attitudes towards school, school suspension, and school dropout (Beran & Lupart, 2009; Beran *et al*, 2012; Kowalski & Limber, 2013; Moon *et al*, 2011; Schneider *et al*, 2012). Although there has been limited investigation into these associations among high school students, academic problems have been found to both be a predictor and consequence of bullying (Liu & Graves, 2011). In a study by Beran *et al* (2012), academically, 17.95% of participants experienced poor concentration, 9.97% experienced low achievement and 7.69% experienced absenteeism. Only 24 (6.83%) of participants reported no negative impact on their academics due to bullying. Bullying could be linked to poor academic achievement either directly or indirectly. For example, being a victim of bullying is linked to psychosocial maladjustment, which in turn is linked to negative academic achievement. Furthermore, bullying is linked to a decrease in classroom or school engagement, which in turn influences academic performance and achievement. However, the findings in a study by Hammig & Jozkowski (2013) held true even when controlling for absenteeism from school due to safety concerns. This suggests bullying is not only associated with victims missing class.

Regardless of the type of abuse, all categories show reduced grades. Both type and number of violence categories are of importance. Adolescents who reported that they were victim to two or three types of bullying had lower grades than those victimized by only one type. This finding is consistent with previous literature that combinations of violence are worse for grades (Strom *et al*, 2013). The study by Bradshaw & Waasdorp (2013) found similar patterns for academic

achievement that were also seen for substance abuse. Across all outcomes, a pattern emerged such that bully-victims, bullies and victims consistently displayed greater odds of academic problems than youth with low levels of bulling. With low involvement adolescents as the reference group, the effect sizes were largest for bully-victims, followed by bullies, then victims (Bradshaw & Waasdorp, 2013). Although perpetrators are found to have low academic achievement, victimization appears related to both high and low achievement (Spriggs *et al*, 2007). Similarly, the odds were greater for males compared to females across nearly all of the academic problems (Bradshaw & Waasdorp, 2013).

It is important to consider bias in associations between bullying and academic achievement. Prior research has indicated the self reported grades typically reflect actual grades for high school students, especially for students with higher grades. Misclassification has been shown to be more likely to occur among lower achieving students, as they tend to overestimate their grades. This differential misclassification, should it occur, would tend to bias the results towards the null. Therefore, if findings are significant, they may err on the side of being more conservative. Response bias could also underestimate the circumstances of adolescents who have dropped out of school, perhaps due to experiencing bullying (Strom, 2013).

Weight Status

Being overweight, or suffering from obesity, are increasing problems around the world and are associated with several physical and psychological health consequences in children, adolescents and adults (Robinson, 2006). Bullying has been linked to being overweight in children in a frequent and widespread manner. Cross sectional studies of adolescents in the US, Canada, Wales, Australia, and England have all found an association between weight status and bullying (Brixval *et al*, 2011). There are three possibilities to be considered in determining causality; obesity may lead to bullying, bullying may lead to obesity, or other factors (including poverty, bad behaviours, unhealthy food and screen time) may lead to both obesity and bullying. Recent prospective data have demonstrated that a child who is deemed overweight by his or her peers is more likely to experience bullying; however, bullying has also shown that it can lead to obesity. It is possible that some children would start overeating as a way of coping with being bullied or having a negative body image (Brixval *et al*, 2011). A study by Mamun *et al* (2012) showed that adolescents who were bullied were at a significantly greater risk of higher BMI and of becoming obese by young adulthood.

A large amount of research suggests that the relationship between bullying and weight status could be mediated by both gender and student self-esteem regarding their body image. A study by Brixval *et al* (2011) had two key findings: first, in both males and females the risk of being bullied is higher among overweight and obese students compared with their normal weight classmates. Second, this association between weight status and bullying seemed to be mediated by body image. In both males and females, Brixval *et al* (2011) found a U-shaped relation between body image and bullying indicating that the further away from the right size the students think their body is, the greater the risk of bullying. Previous research has shown that overweight and obese children are more likely to report greater dissatisfaction with their body and lower self-esteem than normal weight children. Hence, it may be that the lower self-esteem in the overweight and obese students that are in some way are communicated to their classmates which make them easy targets (Brixval *et al*, 2011).

However, while the females reported more bullying when they thought their body was overweight, males were in much higher risk to bullying when they thought their bodies were underweight. Among males it is high status to be physically strong while being skinny is an indication of weakness. Among females there is no advantage for being physically superior; on the contrary there is large pressure on females to live up to the extremely thin ideal of body composition. Therefore, it seems plausible that low self-esteem may result in feeling too fat among females and too thin among males (Brixval *et al*, 2011). However, the findings regarding gender have been somewhat inconsistent. Some studies have found a positive association for both males and females, some have found only an association for females, and others have found negative associations for males. In Mamun *et al*'s (2012) study, a positive association for both males and females, more so for females than males, was found for overweight and obese students only. Few studies have actually examined the association between underweight status and mixed results have been found (Wang *et al*, 2010).

Verbal bullying has been found as a common experience for overweight and obese children. Fox & Farrow (2009) found that overweight and obese adolescents showed higher rates of verbal and social bullying than those who were not overweight. However, overweight and obese adolescents were also more likely to report experiencing physical bullying than those who were not overweight. Important gender differences were also found regarding the type of bullying students were exposed to, with obese males more likely to experience overt or physical

victimization and obese females being more likely to experience relational victimization compared to their average weight peers (Fox & Farrow, 2009).

Research has shown that bullied and overweight students are more absent from school (Brixval *et al*, 2011). This poses a potential problem when studying bullying and weight status; bias could occur if students who are excluded from analyses due to missing answers in one or more variables are different than the included students. For example, it is well known that BMI calculations based on self-report height and weight are underestimated (Brixval *et al,* 2011). This is especially true given the fact that it is common for fewer females to choose to provide this data compared to males (Fox & Farrow, 2009). However, due to economical and ethical considerations, self reported data might be the best way to measure weight status in large surveys (Brixval *et al*, 2011).

Rationale for Student Level Characteristics

Despite the large amount of literature available on the student level characteristics involved in bullying, there is room to expand the understanding of the relationship between bullying and grade, gender, ethnicity and race, smoking, alcohol and drug use, academic achievement and weight status. It is crucial to continue to examine bullying and associated factors that might either result from or contribute to the negative effects (Liu & Graves, 2011; Radliff *et al*, 2012).

The causes and consequences of bullying, including specific risk factors to identify those at risk for bullying, are still not well understood, which likely stems from several gaps and mixed results in the research (Liu & Graves, 2011). These mixed results, and especially mixed results found across countries, make it important to look at bullying behaviour in Canada (Vervoort & Scholte, 2010). Furthermore, while harassment among children has received considerable attention in the research, harassment among high school youth has received less attention (Beran *et al*, 2012; Hammig & Jozkowski, 2013; Radliff *et al*, 2012; Vervoort & Scholte, 2010). Studies have often employed small sample sizes, and given that effective bullying prevention and intervention programs call for a “whole school approach”, large sample sizes appear to be necessary in research on bullying in schools (Hong & Espelage, 2012).

Not only would it be helpful to know the extent of the problem, but knowing who is involved, where it occurs, the types of bullying and its effects on both bullies and victims of bullying will be valuable. For example, the investigation of cyberbullying is at an early stage, and little is known about demographic differences, such as age and race, that correlate with this type of

bullying (Wang *et al*, 2009). This information could be useful to school boards, administrators, counselors and teachers as they plan ways to deal with this increasing prominent problem (Seals & Young, 2003). The reality of school bullying is that it is a moving target and changing in prevalence, type, form, etiology and consequence, thus continued research is always necessary (Hong & Espelage, 2012).

2.4 School Characteristics Involved in Bullying

In this section, school level factors and their involvement in bullying are discussed. School level factors include various structural and functional influences. School level factors have not been widely studied in the area of bullying; thus, it is not known if students are more or less likely to be bullied depending on which school they attend.

Structural Influences

Structural influences are important to consider in the study of bullying. Structural characteristics include school size, the number of year levels, rural/urban status and leadership support (Waters *et al*, 2010). While these factors have not been widely studied, they may play an important role in bullying behaviour in schools. For example, the OSDUHS found that among regions in Ontario, Toronto students were least likely to be bullied by all types of bullying compared to students in other regions (Paglia-Boak *et al,* 2012).

Functional Influences

Functional characteristics are the intangible policies and procedures, which influence the way in which students interact. These include clear and consistent expectations for behavior, student involvement in decision-making, high expectations for learning, participation in extracurricular activities, and care strategies (Waters *et al*, 2010). These factors exert an influence on the specific behaviours of teachers and/or students in response to bullying. The enactment of bullying behaviour may depend on the context and environments that subsequently encourage or suppress such behaviour (Liu & Graves, 2011).

Rationale for School Level Characteristics

School level factors are important to consider for a variety of reasons. It is clear that school level factors can have an impact on bullying behaviour and student level outcomes. Negative school factors can increase the frequency of bullying and reduce the likelihood of students' feeling safe in their school (Hong & Espelage, 2012). Also, all youth attend school,

with the exception of the small minority who drop out. Thus, school is an important place to intervene and provide preventative measures for harmful behaviours. For example, to improve school climate you can configure the rules, values and expectations of support to deal with this kind of problem (Casas *et al*, 2013).

School factors have shown to affect those involved in bullying. There is growing international evidence demonstrating that "low-level" or underlying forms of violence have a profound effect on the learning environment of schools, and bullying has been documented as the most prevalent form of low-level violence in schools (CCL, 2008). Bradshaw & Waasdorp's (2013) study looked at school level indicators predicting bullying. When investigating bullying at the school level, bullying was important for individual grades, for both bullied and non-bullied students. It is alarming if high levels of bullying in their schools significantly decrease the individual grades of the students. This may illustrate how bullying creates an unhealthy and insecure environment that affects all students (Bradshaw & Waasdorp, 2013; Strom *et al*, 2013). In the study by Strom *et al* (2013), bullying was negatively associated with academic achievement. Students in schools with higher levels of bullying performed worse academically. Each increase in a unit of bullying in school corresponded to an average 0.98-point decrease in grades when other characteristics were controlled (Strom *et al*, 2013). These findings demonstrate the importance of the school environment on bullying and youth's psychosocial functioning (Hong & Espelage, 2012).

School level factors have also shown to be important in other health related behaviours. For example, school level factors have been significantly associated with high school students' likelihood of smoking initiation. Leatherdale *et al* (2005) was the first to examine the influence of school characteristics on smoking behaviour. This study found that nonsmoking students with friends who disapprove of smoking were more likely to be susceptible to smoking if they attended a school with student smoking on the periphery, compared to a similar student attending a school where there are no students smoking on the school periphery. Schools that have students standing around outside smoking create a high-risk environment for smoking susceptibility among sub-populations of nonsmoking students (Leatherdale *et al*, 2005). Furthermore, Leatherdale *et al* (2005) identified that students in grades 9, 10 and 11 were more likely to be occasional smokers if they attended a school with a relatively high prevalence of smoking among students in grades 12 and 13. The study by Leatherdale *et al* (2006) further

found that smoking initiation was more likely to occur among grade 6 and 7 students if they attended a school with a high prevalence of smokers among the grade 8 students. Thus, the prevalence of older student smoking at a school can influence the risk of being susceptible to smoking among non-smoking elementary school students (Leatherdale *et al,* 2006).

It has also been found that school level differences account for a significant amount of the variability in the odds of a student being overweight, suggesting that the characteristics of the school environment a student attends are associated with his/her risk of being overweight. Leatherdale *et al* (2011), found that students in younger grades, especially Grade 5, were at substantially increased risk for being overweight as the number of fast food retailers or grocery stores located within a one kilometer radius of their school increased (Leatherdale *et al,* 2011).

3.0 Research Objectives and Hypotheses

This thesis aims to address four research questions about bullying behaviour among grade 9 to 12 students in Ontario high schools.

1. What is the prevalence of bullying victimization (physical, verbal, and cyber) reported by students in the COMPASS study in the previous 30 days?

   Research Question 1 Hypothesis

   Hypothesizing prevalence is difficult, as much of the data in existence are inconsistent. Furthermore, data suggest there could be differences in prevalence depending on the country the study was conducted in and the age of research participants. It is hypothesized that verbal bullying will have the highest rates ranging from 20 to 30% of students, followed by physical and cyberbullying (CCL, 2008; Wang *et al*, 2010). Physical rates are estimated to be close to 3% of students, and cyberbullying rates close to 20% of students (Wang *et al,* 2009; Wang *et al,* 2010; Wang *et al,* 2011).

2. Does the prevalence of bullying victimization vary across schools?

   Research Question 2 Hypothesis

   As there are limited data for school level factors and their influence on bullying behaviour, it is difficult to hypothesize this outcome. However, it is assumed that the prevalence of bullying will vary across schools. School level factors have shown to vary across schools and be important to consider in other health related behaviours, such as smoking initiation (Leatherdale *et al*, 2005; Leatherdale *et al*, 2006; Leatherdale *et al*, 2011). How prevalence will vary across schools when looking at the different types of bullying is unclear.

3. What school characteristics predict the prevalence of bullying in schools?

   Research Question 3 Hypothesis

   School characteristics that will be looked at in this study include structural characteristics (school size, school sector and urban/rural status) and functional characteristics (school budget to improve health, role of the regional health authority, and the ranking of bullying importance to the school). Other researchers have emphasized that structural factors are important to consider (Ma, 2001; Waters *et al,* 2010), thus is it expected that these factors will predict the prevalence of bullying in schools. Furthermore, functional characteristics, including policies and procedures, have also shown to be important, especially in bullying

prevention. The best bullying prevention strategies have strong teacher leadership and strong student-teacher bonding, adult awareness and involvement, and the involvement of multiple stakeholders (Public Safety Canada, 2008), thus it is expected that the various functional characteristics looked at in this study will predict the prevalence of bullying in schools. How these structural and functional factors will affect the different types of bullying is unclear.

4. What student characteristics predict the prevalence of bullying in schools, when controlling for school characteristics?

   Research Question 4 Hypothesis

Several student level characteristics will be looked at in this study, including grade level, gender, race, tobacco alcohol and drug use, academic achievement, and weight status. It is hypothesized that students in lower grades will be more likely to be bullied, for physical and verbal bullying (Carrera *et al*, 2011; Volk *et al*, 2012; Wang *et al*, 2009). Cyberbullying, however, may have a later peak and may be higher for students in higher grade levels, when compared to traditional bullying (Schneider *et al,* 2012; Turner *et al,* 2013). When looking at gender, it is hypothesized that there will be higher rates of physical victimization for males, while females will have higher rates of verbal and cyberbullying (Beran *et al*, 2012; Goldweber *et al*, 2013; Nocentini *et al*, 2013; Hong & Espelage, 2012; Paglia-Boak *et al,* 2012; Vervoort & Scholte, 2010). For race, it is hypothesized that in general students who identify as white will have higher rates of victimization than other ethnicities (Hong & Espelage, 2012).

It is hypothesized that tobacco, alcohol and drug use will be significantly associated with all types of bullying behaviours; however, cyberbullying may be slightly more significant (Litwiller & Brausch, 2013). This will be true for smoking and marijuana use, however there may be smaller associations seen between bullying victimization and alcohol use (Bradshaw & Waasdorp, 2013). All types of bullying are expected to be associated with a reduction in academic achievement (Strom *et al,* 2013). Those victimized by cyberbullying will have worse grades compared to those victimized by traditional bullying (Schneider *et al,* 2012). Finally, all types of bullying behaviour will be associated with weight status. Students who are overweight or underweight are expected to be victimized more, especially for verbal bullying, compared to their normal weight peers (Brixval *et al,* 2011; Fox & Farrow, 2009).

4.0 Methods

4.1 Overview of the COMPASS study

Data collected from the COMPASS study, a larger host study, was used for the present study (Leatherdale *et al,* 2014). COMPASS is a longitudinal study that began in 2012. COMPASS was designed to follow a cohort of grade 9 to 12 students attending a convenience sample of Ontario secondary schools for four years to understand how changes in school environment characteristics (policies, programs, built environments) are associated with changes in youth health behaviours (Thompson-Haile & Leatherdale, 2013). The COMPASS study collects student and school level data. Student level data are collected through a self-report questionnaire, where questions on bullying were adapted from the Ontario Student Drug Use and Health Survey (OSDUHS). School administrators answering the COMPASS study's School Policies and Practices Questionnaire provide school level data. The student level and school level questionnaires can be found in Appendices A and B, respectively.

4.2 Overview of the Present Study

The present study used cross-sectional data collected from baseline measurements obtained from the COMPASS Study. This study received ethics approval from the University of Waterloo Office of Research Ethics. Appropriate school boards also approved the study procedures.

4.2.1 Sample

School Level Sample

Among the 37 public[1] schools approached by COMPASS for baseline data, 18 (49%) schools agreed to participate, 17 (46%) schools declined to participate, and two schools did not provide a response. Among the 51 separate[2] schools approached, 27 (53%) schools agreed to participate, 13 (27%) schools declined to participate, and 11 schools did not provide a response. Among those 23 private[3] schools approached, four (17%) schools agreed to participate, 14 (61%) schools declined to participate, and five schools did not provide a response. This resulted

[1] Public schools in Ontario are government funded and do not affiliate with any religious group

[2] Separate schools are unique to a few provinces and territories in Canada, including Ontario, and are government funded and receive students from particular religious groups

[3] Private schools in Ontario are not government funded, but rather funded by private organizations or individuals

in a final sample of 49 recruited secondary schools in Ontario who approved the COMPASS study. A total of 43 schools completed the first wave of the COMPASS study data collection (Thompson-Haile & Leatherdale, 2013).

Student Level Sample

In participating schools, there was a total of 30 147 eligible students to complete the COMPASS study. A sample of 24 173 students completed the COMPASS questionnaire, giving a response rate of 80.2%. The final sample consisted of 23 921 students; 251 students were removed from analyses because they did not report their grade and/or gender.

4.2.2 Measures

The operational definitions for measures used are consistent with previous research using national standards or current national public health guidelines (Leatherdale *et al,* 2005; Leatherdale *et al,* 2006; Leatherdale *et al,* 2011; Statistics Canada, 2011).

Outcome Measures

Outcome measures were assessed using the COMPASS questionnaire, which asked students, "In the last 30 days, in what ways were you bullied by other students? (*Mark all that apply*)". Students could reply "I have not been bullied in the last 30 days", "Physical attacks (e.g., getting beaten up, pushed, or kicked)", "Verbal attacks (e.g., getting teased, threatened, or having rumours spread about you)", "Cyber attacks (e.g., being sent mean text messages or having rumours spread about you on the Internet)", and "Had someone steal from you or damage your things".

Students were categorized as either responding "Yes" or "No" to physical bullying victimization. Students who marked "Physical attacks" were recorded as responding "Yes". Students who did not mark "Physical attacks" were recorded as responding "No".

Students were categorized as either responding "Yes" or "No" to verbal bullying victimization. Students who marked "Verbal attacks" were recorded as responding "Yes". Students who did not mark "Verbal attacks" were recorded as responding "No".

Students were categorized as either responding "Yes" or "No" to cyberbullying victimization. Students who marked "Cyber attacks" were recorded as responding "Yes". Students who did not mark "Cyber attacks" were recorded as responding "No".

Student Level Predictor Variables

Grade level was determined using the COMPASS study questionnaire, which asked students, "What grade are you in?" Possible responses included: Grade 9, Grade 10, Grade 11, and Grade 12. Each of the four grade levels was assessed separately.

Gender was determined using the COMPASS study questionnaire, which asked students, "Are you male or female?" Each of the two responses was assessed separately.

Race was determined using the COMPASS study questionnaire. The questionnaire asked students, "How would you describe yourself? *(Mark all that apply)."* Possible responses included: White, Black, Asian, Aboriginal (First Nations, Metis, Inuit), Latin American/Hispanic, and other: _____. For analyses, students were classified as either "white", or "other" to ensure sufficient power.

Disposable Income was determined using the question in COMPASS that asks students, "About how much money do you usually get each week to spend on yourself or to save?" Students were grouped into four categories of having either $0 spending money per week, $1 to $20, $21 to $100, and over $100 per week.

Tobacco, alcohol and drug use were assessed by classifying students as a current user of cigarettes, alcohol and marijuana. Smoking status was determined by the COMPASS questionnaire, which asked students, "On how many of the last 30 days did you smoke one or more cigarettes?" Response options included: None, 1 day, 2 to 3 days, 4 to 5 days, 6 to 10 days, 11 to 20 days, 21 to 29 days, and 30 days (every day). Students who answered 1 day, or more frequently, were classified as a current user. Students who answered None were not classified as a current user. To determine alcohol use, the question that asked students, "In the last 12 months, how often did you have a drink of alcohol that was more than just a sip?" was used. Response options included: I have never drank alcohol, I did not have alcohol in the last 12 months, I have only had a sip of alcohol, less than once a month, once a month, one or two times a month, once a week, two or three times a week, four to six times a week, and every day. Students who answered once a month, or more frequently, were classified as current users. Students who answered less than once a month, or less frequently, were not classified as a current user. Finally, to determine marijuana use, the question that asked students, "In the last 12 months, how often did you use marijuana or cannabis? (A joint, pot, weed, hash)" was used. Response options included: I have never used marijuana, I have used marijuana but not in the

last 12 months, less than once a month, once a month, two or three times a month, once a week, two or three times a week, four to six times a week, and every day. If students responded once a month, or more frequently, they were classified as current users. If students responded with less than once a month, or less frequently, they were not classified as a current user.

Academic achievement was assessed by classifying students as high academic achievement, moderate academic achievement, or low academic achievement, based on their responses to the COMPASS questionnaire. One question asked students, "In your current or more recent math course, what is your approximate overall mark? (Think about last year if you have not taken math yet this year). Responses included: 90% to 100%, 80% to 89%, 70 to 79%, 60 to 69%, 55 to 59%, 50 to 54% and less than 50%. Another question asked students, "In your current or most recent English course, what is your approximate overall mark? (Think about last year if you have no taken English yet this year)." Response options were the same as the previous question. An average of both grades were taken, then marks were classified as high if they were 80% or higher, marks were moderate if they were between 60 to 79%, and marks were low if they were 59% or lower.

Finally, **weight status** was determined using BMI measurements (BMI=kg/m^2). Students self reported their height and weight in the COMPASS questionnaire. Students were asked, "How tall are you <u>without</u> your shoes on? (Please write your height in feet and inches **<u>OR</u>** in centimeters, and then fill in the appropriate numbers for your height.) Students were also asked, "How much do you weight <u>without</u> your shoes on? (Please write your weight in pounds **<u>OR</u>** in kilograms, and then fill in the appropriate numbers for your weight.)" Students with a BMI of less than 19.0 were classified as underweight, students with a BMI of 19.0 to 24.9 were classified as normal weight, students with a BMI of 25.0 to 29.9 were classified as overweight, and students with a BMI of 30.0 or greater were classified as obese. For analyses, students classified as overweight or obese were collapsed into one category to ensure sufficient power.

<u>School Level Predictor Variables</u>

School size was assessed by grouping schools by whether they were large or small. High schools with a population of 1000 or more students were classified as large. Schools with a population of 999 or less students were classified as small. **Urban/rural status** was determined by the population size and density of the town or city that the school was located in based on data from Statistics Canada (2012). According to Statistics Canada (2011), an urban

area in Canada is an area with a population of at least 1,000 people where the density is greater than 400 persons per km^2.

School budget to improve health was assessed using the COMPASS study School Policies and Practices Questionnaire, given to all schools to complete. Schools were asked, "What financial resources are available annually from your school board to support efforts to improve the health of students at your school?" Schools responded by stating the annual budget given to them (less than $100, between $100 to $499, between $500 to $999, and greater than $1000), whether they had staff time available (e.g., for professional development, monitoring of policy compliance, etc.), and whether they had space available (Response options included Yes or No). Schools were rated as having high or low financial resources.

Role of the regional health authority was assessed using the School Policies and Practices Questionnaire. A question asked schools, "During the past 12 months, what role did your regional health authority/local public health unit play when working with your school on health promotion and/or activities for students? (Circle all that apply)". Schools that responded, "No contact with regional health authority/local health unit/department regarding health promotion and/or activities" or only one of the options were classified as having less of a relationship. Schools that selected two or more of the options: Provide information/resources/programs (e.g., posters, toolkits), Solved problems jointly or Developed/implemented program activities jointly were classified as having more of a relationship.

Ranking of bullying importance to the school was assessed by asking schools to "Please rank these school/health-related issues in terms of importance to your schools (1=highest priority, 2=second highest priority, etc)." The issues included: tobacco use, alcohol and other drug use, health eating, physical activity, bullying/violence, mental health, sexual health, sun safety/tanning beds, obesity, sedentary behaviours/screen-time, and other: _____. If bullying was ranked one to three, the school was rated as high. If bullying was ranked four or more, the school was rated as low.

4.2.3 Data Analysis

Descriptive Statistics

Student level characteristics were reported. The number of students and the percentage of the sample in grades 9, 10, 11 and 12 were reported. This was done similarly for gender

(males and females), disposable income and race (whites and others). The number of students and their percentage of the sample were reported for current and non-users of alcohol, tobacco and marijuana. This was also done for students ranking as high, moderate or low academic achievement. Finally, the number of students and percentage of the sample who were underweight, normal weight, over weight and obese were reported.

School level characteristics were reported. The number of large and small schools, public, and urban and rural schools were reported. The numbers of schools were reported with regards to their school budget to improve health, their role of the regional health authority, and their ranking of bullying importance.

Overall prevalence of involvement in bullying in the previous 30 days was reported. This was determined by classifying anyone who answered positively (i.e. anyone who answered one or two of the two questions on bullying in the COMPASS questionnaire and their response was not "I have not been bullied in the last 30 days" and "I did not bully other students in the last 30 days" to at least one question) as being involved in bullying.

The prevalence of different involvement in bullying was reported by separating respondents indicating overall bullying into one of three groups (i.e. either as a victim, bully-victim, or bully). To be classified as a victim, one must have responded positively to the victim question and negatively to the bully question in the COMPASS questionnaire. To be classified as a bully-victim, one must have responded positively to both the victim and bully question in the COMPASS questionnaire. To be classified as a bully, one must have responded negatively to the victim question and positively to the bully questions in the COMPASS questionnaire.

Frequency of involvement in bullying was determined separately for the victim and bully questions. Thus, if a student was classified as a bully-victim, they were counted in both the victim and bully analyses. Those responding that they were victimized, or bullied others, less than once a week, about once a week, two or three times a week, or daily or almost daily, were grouped accordingly.

Research Question 1

The prevalence of physical, verbal and cyberbullying victimization was calculated using the formula below. Chi-squared tests were performed to test for significant differences.

$$\text{Prevalence} = \frac{\text{Persons with a given health indicator during a specified period of time}}{\text{Total population during the same time period}} \times 1000$$

Research Question 2

Consistent with other multi-level studies (Leatherdale *et al*, 2011) a specific modeling procedure was used. It was examined if differences in the three types of bullying are random or fixed across schools. The school-level variance term, derived from empty models, was used to calculate the intraclass correlation (ICC), where the ICC represented the proportion of the total variance in student bullying that was due to differences across schools. An ICC value that is close to one indicates that the variability between individuals within a group is low, meaning that individuals within a group are very similar to each other and school level characteristics are important predictors of behaviour. In contrast, an ICC value that is close to 0 indicates that the variability between individuals within a group is high, meaning that individuals within a group are not very similar to each other and student level characteristics are important predictors of behaviour. The formula to calculate the ICC is as follows:

$$\rho_I = \frac{\text{population variance between schools}}{\text{total variance}} = \frac{\sigma^2_{\mu 0}}{\sigma^2_{\mu 0} + \pi^2/3}$$

Research Question 3

The association between school level characteristics and physical, verbal and cyberbullying behaviour while modeling for between-school random variation using PROC GLIMMIX in SAS was investigated. A series of univariate analyses were performed to examine if each school level factor was independently associated with bullying. The first model examined how school characteristics affect physical bullying. The second model examined how school characteristics affect verbal bullying. The third model examined how school characteristics affect cyberbullying.

Research Question 4

Finally, a multivariate model was developed to simultaneously examine how the student level characteristics and the school level characteristics were associated with bullying, while modeling for between-school random variation using PROC GLIMMIX in SAS. The first model examined how school and student characteristics affect physical bullying. The second model examined how school and student characteristics affect verbal bullying. The third model examined how school and student characteristics affect cyberbullying.

Rationale for Multi-Level Analysis

As students are nested in schools, there was a need to take a multilevel perspective for analysis to examine the issue of bullying in schools (Ma, 2001). Multilevel analysis is a method for the analysis of data with complex patterns of variably; it is specifically for nested sources of variability, such as students in classes. It is important to take into account the variability associated with each level of nesting, or else it is possible to come to the wrong conclusions if sources of variability are ignored (Snijders & Bosker, 1999). Health research often only includes explaining individual-level outcomes in terms of individual-level independent variables, despite the fact that health behaviours occur in social settings. Populations, or groups, are often thought of as collections of independent individuals, rather than entities with properties that may affect individuals within them. By focusing only on individual variation, the potential importance of group-level attributes in influencing individual-level outcomes is ignored. In addition, if outcomes for individuals within groups are correlated, the assumption of independence of observations is violated, resulting in incorrect standard errors and inefficient estimates. An approach to fix this is to explain variation in the dependent variable at one level as a function of variables defined at various levels, plus interactions within and between levels. Multilevel analysis is one method to perform this (Diez-Roux, 2000).

Other methods in analyzing group-level characteristics have several limitations. One method is to focus exclusively on assessing data at the group level. This approach eliminates the non-independence problem mentioned above, but ignores the role of individual-level variables in shaping the outcome. This approach collapses all variables to the same level and ignores the multilevel structure. Another approach is to define separate regressions for each group, or to include group membership in individual-level equations in the form of dummy variables. This approach does not examine how specific group-level properties affect individual-level outcomes (Diez-Roux, 2000). Multilevel analysis differs from these approaches in that it allows the simultaneous examination of the effects of school level and student level predictors, the non-independence of observations within groups is accounted for, groups or contexts are not treated as unrelated, but are seen as coming from a larger population of groups, and both individual and group variation can be examined (Diez-Roux, 2000).

5.0 Results

5.1 Descriptive Statistics

5.1.1 Student Characteristics

Among respondents in the COMPASS baseline sample, 23.6% (N=5641) were involved in bullying in the previous 30 days. Among these students, 51.9% (N=2925) were victims, 22.4% (N=1264) were bullies, and 25.7% (N=1452) were bully-victims.

Among all victims (N=4377: including victims and bully-victims), 14.7% (N=645) stated they were physically bullied, 85.0% (N=3722) stated they were verbally bullied, and 28.3% (N=1238) stated that they were cyberbullied in the previous 30 days. Among all bullies (N=2716: including bullies and bully-victims), 18.6% (N=504) stated that they have physically bullied another individual, 84.1% (N=2285) stated that they have verbally bullied another individual, and 17.5% (N=475) stated that they had cyberbullied another individual in the previous 30 days. Frequencies of victimization and bullying can be seen below in Figure 1.

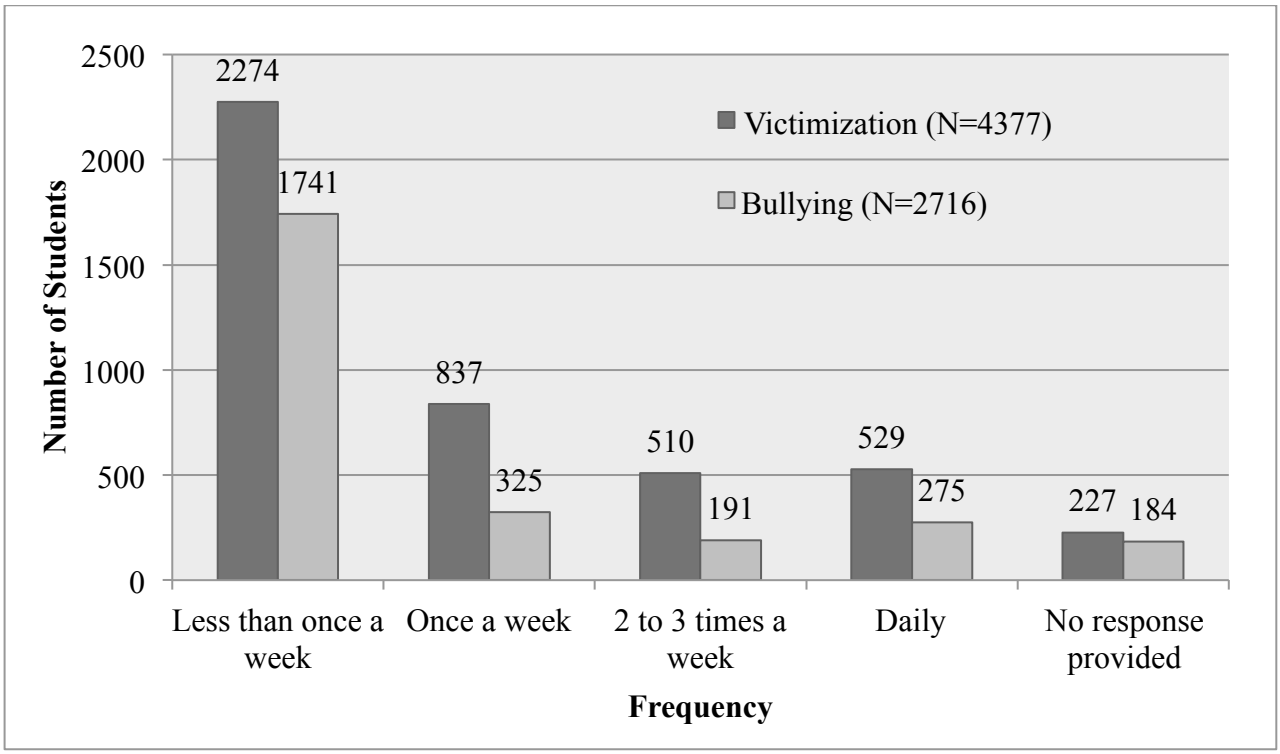

Figure 1 Descriptive statistics of frequency of victimization and bullying among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

As shown in Table 1, more males than females were involved in physical bullying (X^2=104.5, df=1, ρ<0.001): however, more females than males were involved in verbal (X^2=200.8, df=1, ρ<0.001) and cyberbullying (X^2=302.1, df=1, ρ<0.001). More males than females used tobacco (X^2=117.8, df=1, ρ<0.001), alcohol (X^2=76.1, df=2, ρ<0.001), and marijuana (X^2=214.0, df=2, ρ<0.001). Males were also more likely to be overweight or obese compared to females (X^2=393.4, df=3, ρ<0.001). Finally, more females than males had high academic achievement (X^2=305.2, df=3, ρ<0.001).

As shown in Table 2, type of bullying was significantly associated with race (X^2 = 64.7, df = 4, ρ < 0.001), tobacco use (X^2 = 82.8, df = 2, ρ < 0.001), alcohol use (X^2 = 49.9, df = 4, ρ < 0.001), marijuana use (X^2 = 99.1, df = 4, ρ < 0.001), academic achievement (X^2 = 77.1, df = 6, ρ < 0.001), and BMI (X^2 = 36.7, df = 6, ρ < 0.001).

Table 1 Descriptive statistics of student level characteristics by gender among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

Parameters		**Gender**				
		Male (N=12052)		**Female (N=11869)**		**Chi Squared Value**
		%	**N**	**%**	**N**	
Physical Bullying	Yes (N=645)	3.8	458	1.6	190	$X^2 = 104.5$ df = 1 $\rho < 0.001$
	No (N=23276)	96.2	11594	98.4	11679	
Verbal Bullying	Yes (N=3722)	12.3	1482	18.9	2243	$X^2 = 200.8$ df = 1 $\rho < 0.001$
	No (N=20199)	87.7	10570	81.1	9626	
Cyberbullying	Yes (N=1238)	2.7	325	7.7	914	$X^2 = 302.1$ df = 1 $\rho < 0.001$
	No (N=22683)	97.3	11727	92.3	10955	
Grade	9 (N=6270)	26.0	3134	26.4	3133	$X^2 = 4.3$ df = 3 $\rho > 0.001$*
	10 (N=6144)	25.3	3049	26.1	3098	
	11 (N=5866)	24.7	2977	24.4	2896	
	12 (N=5641)	24.0	2892	23.1	2742	
Race	White (N=17015)	69.7	8400	72.6	8617	$X^2 = 27.8$ df = 2 $\rho < 0.001$
	Other (N=6807)	29.8	3592	27.1	3216	
	Missing (N=99)	0.5	60	0.3	36	
Disposable Income	$0 (N=3746)	16.3	1965	15.0	1780	$X^2 = 90.6$ df = 5 $\rho < 0.001$
	$1 - $20 (N=7274)	30.3	3652	30.5	3620	
	$21 - $100 (N=6436)	25.1	3025	28.6	3395	
	$100+ (N=3371)	15.9	1916	12.4	1472	
	Do not know (N=2938)	11.8	1422	12.8	1519	
	Missing (N=156)	0.6	72	0.7	83	
Tobacco Use	Current smoker (N=1380)	7.4	892	4.1	487	$X^2 = 117.8$ df = 1 $\rho < 0.001$
	Not current (N=22541)	92.6	11160	95.9	11382	
Alcohol Use	Current user (N=8379)	36.9	4447	33.1	3929	$X^2 = 76.1$ df = 2 $\rho < 0.001$
	Not current (N=14885)	59.8	7207	64.7	7679	
	Missing (N=657)	3.3	398	2.2	261	
Marijuana Use	Current user (N=4049)	20.1	2423	13.6	1614	$X^2 = 214.0$ df = 2 $\rho < 0.001$
	Not current (N=19340)	77.2	9304	84.6	10041	
	Missing (N=532)	2.7	325	1.8	214	
Academic Achievement	High (N=12646)	47.5	5725	58.3	6920	$X^2 = 305.2$ df = 3 $\rho < 0.001$
	Moderate (N=8915)	40.6	4893	33.9	4023	
	Low (N=1417)	7.2	868	4.6	546	
	Missing (N=943)	4.7	566	3.2	380	
Body Mass Index (BMI)	Underweight (N=340)	1.5	181	1.4	166	$X^2 = 393.4$ df = 3 $\rho < 0.001$
	Normal (N=13613)	52.9	6375	60.9	7228	
	Over/Obese (N=4792)	25.1	3025	14.9	1769	
	Missing (N=5176)	20.5	2471	22.8	2706	

* insignificant

Table 2 Descriptive statistics of student level characteristics of students who reported they had been bullied by type of abuse among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

Parameters	Bullying Type						Chi Squared Value
	Physical (N=645)[b]		Verbal (N=3722)[c]		Cyber (N=1238)[d]		
Student Level Characteristics	%[a]	N	%[a]	N	%[a]	N	
Grade							
9 (N=6270)	30.4	196	28.3	1055	28.0	347	$X^2 = 4.9$ df = 6 $\rho > 0.001$*
10 (N=6144)	28.8	186	27.2	1011	27.3	338	
11 (N=5866)	24.2	156	24.5	912	25.0	309	
12 (N=5641)	16.6	107	20.0	744	19.7	244	
Gender							
Male (N=12052)	70.2	453	39.7	1478	26.3	326	$X^2 = 341.2$ df = 2 $\rho < 0.001$
Female (N=11869)	29.8	192	60.3	2244	73.7	912	
Race							
White (N=17015)	60.2	388	75.2	2798	74.1	917	$X^2 = 64.7$ df = 4 $\rho < 0.001$
Other (N=6807)	39.2	253	24.6	915	25.7	317	
Missing (N=99)	0.6	4	0.2	9	0.2	4	
Disposable Income							
$0 (N=3746)	18.0	116	16.1	603	14.2	176	$X^2 = 21.5$ df = 10 $\rho > 0.001$*
$1 - $20 (N=7274)	32.0	206	32.5	1208	30.5	378	
$21 - $100 (N=6436)	23.7	153	26.4	982	28.5	352	
$100+ (N=3371)	16.1	104	13.5	501	16.8	208	
Do not know (N=2938)	9.9	64	10.9	404	9.2	114	
Missing (N=156)	0.3	2	0.6	24	0.8	10	
Tobacco Use							
Current smoker (N=1380)	18.4	119	7.8	290	13.1	162	$X^2 = 82.8$ df = 2 $\rho < 0.001$
Not current (N=22541)	81.6	526	92.2	3432	86.9	1076	
Alcohol Use							
Current user (N=8379)	45.4	293	40.6	1510	51.3	635	$X^2 = 49.9$ df = 4 $\rho < 0.001$
Not current (N=14885)	51.6	333	57.6	2145	46.8	580	
Missing (N=657)	3.0	19	1.8	67	1.9	23	
Marijuana Use							
Current user (N=4049)	35.3	228	21.2	788	31.1	385	$X^2 = 99.1$ df = 4 $\rho < 0.001$
Not current (N=19340)	63.1	407	78.2	2911	68.1	843	
Missing (N=532)	1.6	10	0.6	23	0.8	10	
Academic Achievement							
High (N=12646)	42.2	272	52.2	1944	47.7	590	$X^2 = 77.1$ df = 6 $\rho < 0.001$
Moderate (N=8915)	38.0	245	37.6	1401	38.7	479	
Low (N=1417)	17.2	111	7.5	278	11.6	144	
Missing (N=943)	2.6	17	2.7	99	2.0	25	
Body Mass Index (BMI)							
Underweight (N=340)	3.7	24	1.7	63	2.3	29	$X^2 = 36.7$ df = 6 $\rho < 0.001$
Normal (N=13613)	46.7	301	55.7	2075	53.7	665	
Over/Obese (N=4792)	22.0	142	22.4	832	20.7	256	
Missing (N=5176)	27.6	178	20.2	752	23.3	288	

[a] statistics of students are those responding "Yes". Students responding "No" are not presented
[b] A total of 645 students were physically bullied, which is 2.7% of students in the entire sample
[c] A total of 3722 students were verbally bullied, which is 15.6% of students in the entire sample
[d] A total of 1238 students were cyberbullied, which is 5.2% of students in the entire sample
* insignificant

5.1.2 School Characteristics

Among the 43 participating schools, 40 schools were classified as being small (<1000 students), while three schools were large. A total of 23 schools were in an urban area, and 20 were in a rural area. For a budget to improve health, 22 schools were classified as having a high school budget, 19 had a low budget, and two schools did not provide a response. For their relationship with the regional health authority, 30 schools were classified as having less of a relationship, 12 schools had more of a relationship, and one school did not provide a response. For their ranking of bullying importance to the school, 32 schools had a high rating, six had a low rating, and five schools provided no response.

As shown in Table 3, type of bullying was not associated with any school level characteristics. Bullying prevalence in the 43 schools ranged from 12.3% to 31.5% of students victimized.

Table 3 Descriptive statistics of school level characteristics of students who reported they had been bullied by type of abuse among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

Parameters	**Bullying Type**						**Chi Squared Value**
	Physical (N=645)[b]		**Verbal (N=3722)[c]**		**Cyber (N=1238)[d]**		
School Level Characteristics	**%[a]**	**N**	**%[a]**	**N**	**%[a]**	**N**	
School Size							
Large (N=3)	9.6	62	11.4	424	10.8	134	$X^2 = 1.9$ df = 2 ρ > 0.001*
Small (N=40)	90.4	583	88.6	3298	89.2	1104	
Urban/Rural Status							
Urban (N=23)	60.0	387	59.5	2215	60.8	753	$X^2 = 0.7$ df = 2 ρ > 0.001*
Rural (N=20)	40.0	258	40.5	1507	39.2	485	
School Budget to Improve Health							
High (N=22)	46.7	301	47.9	1783	48.6	602	$X^2 = 11.8$ df = 4 ρ > 0.001*
Low (N=19)	48.2	311	44.0	1638	42.4	525	
Missing (N=2)	5.1	33	8.1	301	9.0	111	
Role of the Regional Health Authority							
More (N=12)	33.3	215	32.3	1202	32.3	400	$X^2 = 1.1$ df = 4 ρ > 0.001*
Less (N=30)	65.3	421	65.9	2453	65.7	813	
Missing (N=1)	1.4	9	1.8	67	2.0	25	
Ranking of Bullying Importance to the School							
High (N=32)	79.2	511	78.3	2914	77.2	956	$X^2 = 3.8$ df = 4 ρ > 0.001*
Low (N=6)	12.7	82	11.6	432	12.4	153	
Missing (N=5)	8.1	52	10.1	376	10.4	129	

[a] statistics of students are those responding "Yes". Students responding "No" are not presented
[b] A total of 645 students were physically bullied, which is 2.7% of students in the entire sample
[c] A total of 3722 students were verbally bullied, which is 15.6% of students in the entire sample
[d] A total of 1238 students were cyberbullied, which is 5.2% of students in the entire sample
* insignificant

5.2 Research Questions

5.2.1 Research Question 1

In the Year 1 sample of COMPASS, 18.3% (N=4377) of grade 9 to 12 students were victimized by bullying in the previous 30 days. Figure 2 below shows the distribution of students based on how many types, and what types of bullying they were victimized by.

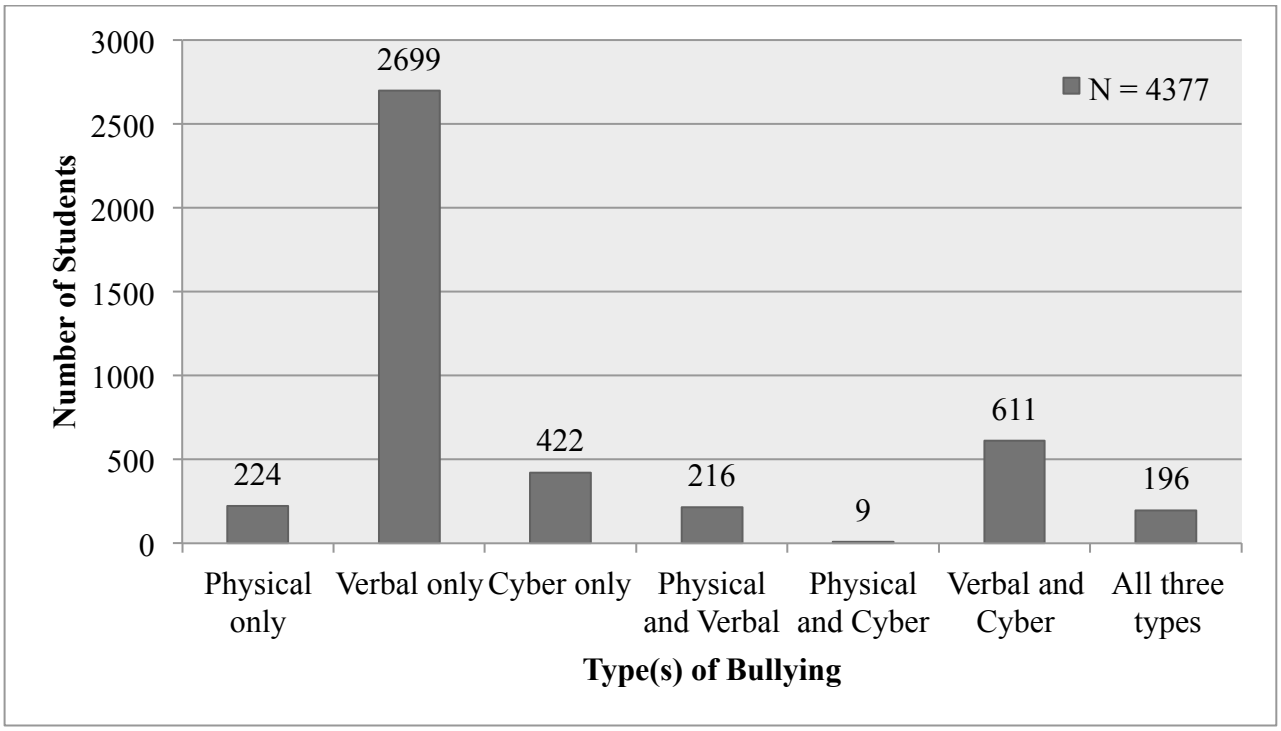

Figure 2 Descriptive statistics of types of bullying experienced among victimized grade 9 to 12 students in COMPASS, Year 1, 2012-2013

5.2.2 Research Question 2

Among grade 9 to 12 students in the Year 1 sample of COMPASS, significant between-school random variation in the odds of being physically bullied was identified ($\sigma^2_{\mu 0}$=0.087(0.036), ρ<0.001): school-level differences accounted for 2.6% of the variability in the odds of a student being physically bullied versus not. Among grade 9 to 12 students in the Year 1 sample of COMPASS, significant between-school random variation in the odds of being verbally bullied was also identified ($\sigma^2_{\mu 0}$=0.047(0.0147), ρ<0.001): school-level differences accounted for 1.4% of the variability in the odds of a student being verbally bullied versus not. Finally, among grade 9 to 12 students in the Year 1 sample of COMPASS, significant between-

school random variation in the odds of being cyberbullied was identified ($\sigma^2_{\mu 0}$=0.101(0.032), ρ<0.001): school-level differences accounted for 3.0% of the variability in the odds of a student being cyberbullied versus not.

5.2.3 Research Question 3

As shown in Table 4, students in large schools were significantly less likely to get physically bullied compared to students in small schools (OR = 0.64, 95%CI 0.42 to 0.99).

Table 4 Multi-level logistic regression models examining school factors associated with bullying among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

Parameters		**Odds Ratio (95% CI)**		
		Model 1 Physical Bullying	**Model 2 Verbal Bullying**	**Model 3 Cyberbullying**
School Size	Large (N=3)	0.64 (0.42, 0.99)*	0.77 (0.58, 1.02)	0.76 (0.49, 1.17)
	Small (N=40)	1.00	1.00	1.00
Urban/Rural	Urban (N=23)	0.87 (0.68, 1.12)	0.86 (0.74, 1.01)	0.93 (0.73, 1.19)
	Rural (N=20)	1.00	1.00	1.00
School Budget to Improve Health	High (N=22)	0.94 (0.73, 1.21)	1.08 (0.92, 1.27)	1.15 (0.90, 1.47)
	Low (N=19)	1.00	1.00	1.00
	Missing (N=2)	0.59 (0.33, 1.05)	1.07 (0.74, 1.55)	1.27 (0.74, 2.17)
Role of the Regional Health Authority	More (N=12)	1.03 (0.78, 1.37)	1.01 (0.85, 1.21)	1.00 (0.76, 1.30)
	Less (N=30)	1.00	1.00	1.00
	Missing (N=1)	0.65 (0.26, 1.62)	0.83 (0.49, 1.42)	0.97 (0.44, 2.16)
Ranking of Bullying Importance	High (N=32)	0.91 (0.63, 1.33)	0.98 (0.77, 1.24)	0.92 (0.64, 1.31)
	Low (N=6)	1.00	1.00	1.00
	Missing (N=5)	0.78 (0.46, 1.33)	0.99 (0.72, 1.37)	0.99 (0.61, 1.62)

* significant (ρ <0.05)
Model 1 – Physically bullied (1) = n = 645, physically bullied (0) = n = 23276
Model 2 – Verbally bullied (1) = n = 3722, verbally bullied (0) = n = 20199
Model 3 – Cyberbullied (1) = n = 1238, cyberbullied (0) = n = 22683

5.2.4 Research Question 4

School level characteristics were not included in research question 4, as they were not powerful enough to remain significant in the predictive models when more information was available. However, between-school clustering was controlled for with a class statement in model analyses.

<u>Physical Bullying</u>

A generalized estimating equation (GEE) model is presented in Table 5, which estimates parameters of linear models that used binary data with unknown correlations between outcomes. As shown in Table 5, students in grade 9 (OR=2.13, 95%CI 1.64 to 2.75), grade 10 (OR=1.89, 95%CI 1.47 to 2.43) or grade 11 (OR=1.42, 95%CI 1.10 to 1.82) were significantly

more likely to get physically bullied compared to students in grade 12 students. Females were less likely to get physically bullied compared to males (OR=0.48, 95%CI 0.40 to 0.57). Students of other races were more likely to get physically bullied compared to white students (OR=1.52, 95%CI 1.28 to 1.81). Current smokers (OR=2.09, 95%CI 1.63 to 2.69), and users of marijuana (OR=1.84, 95%CI 1.48 to 2.27) were more likely to get physically bullied compared to nonsmokers and nonusers of marijuana. Students with low academic achievement were more likely to get physically bullied compared to students with high academic achievement (OR=2.16, 95%CI 1.69 to 2.77). Finally, underweight students were more likely to get physically bullied compared to their normal weight peers (OR=3.16, 95%CI 2.02 to 4.94). A significant interaction was found between tobacco use and gender, which can be seen in Figure 3 below.

Table 5 GEE models examining student factors associated with bullying among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

Parameters		**Model 1 Physical Bullying**	**Model 2 Verbal Bullying**	**Model 3 Cyberbullying**
		Odds Ratio (95%CI)	Odds Ratio (95%CI)	Odds Ratio (95%CI)
Grade	9 (N=6270)	2.13 (1.64, 2.75)	1.47 (1.32, 1.64)	1.81 (1.50, 2.18)
	10 (N=6144)	1.89 (1.47, 2.43)	1.36 (1.23, 1.52)	1.56 (1.30, 1.86)
	11 (N=5866)	1.42 (1.10, 1.82)	1.24 (1.11, 1.38)	1.31 (1.10, 1.56)
	12 (N=5641)	1.00	1.00	1.00
Gender	Female (N=11869)	0.48 (0.40, 0.57)	1.78 (1.66, 1.92)	3.56 (3.12, 4.08)
	Male (N=12052)	1.00	1.00	1.00
Race	White (N=17015)	1.00	1.00	1.00
	Other (N=6807)	1.52 (1.28, 1.81)	0.84 (0.77, 0.92)	0.94 (0.81, 1.08)
Disposable Income	$0 (N=3746)	1.00	1.00	1.00
	$1 - $20 (N=7274)	0.89 (0.71, 1.13)	0.99 (0.89, 1.10)	1.03 (0.85, 1.24)
	$21 - $100 (N=6436)	0.76 (0.59, 0.98)	0.85 (0.76, 0.96)	0.99 (0.81, 1.20)
	$100+ (N=3371)	0.92 (0.69, 1.23)	0.87 (0.76, 1.00)	1.21 (0.97, 1.50)
	Do not know (N=2938)	0.71 (0.52, 0.97)	0.80 (0.70, 0.92)	0.76 (0.59, 0.97)
Tobacco Use	Current (N=1380)	2.09 (1.63, 2.69)	1.29 (1.10, 1.50)	1.77 (1.44, 2.18)
	Not current (N=22541)	1.00	1.00	1.00
Alcohol Use	Current user (N=8379)	1.23 (1.01, 1.50)	1.28 (1.17, 1.39)	1.71 (1.49, 1.96)
	Not current (N=14885)	1.00	1.00	1.00
	Missing (N=657)	1.40 (0.81, 2.43)	1.33 (0.99, 1.79)	1.52 (0.93, 2.47)
Marijuana Use	Current user (N=4049)	1.84 (1.48, 2.27)	1.25 (1.13, 1.39)	1.74 (1.48, 2.03)
	Not current (N=19340)	1.00	1.00	1.00
	Missing (N=532)	0.76 (0.36, 1.60)	0.27 (0.17, 0.44)	0.49 (0.24, 1.02)
Academic Achievement	High (N=12646)	1.00	1.00	1.00
	Moderate (N=8915)	1.04 (0.87, 1.25)	1.03 (0.96, 1.12)	1.11 (0.98, 1.27)
	Low (N=1417)	2.16 (1.69, 2.77)	1.31 (1.13, 1.52)	1.98 (1.60, 2.44)
	Missing (N=943)	0.61 (0.36, 1.05)	0.87 (0.69, 1.10)	0.67 (0.43, 1.03)
BMI (Body Mass Index)	Underweight (N=340)	3.16 (2.02, 4.94)	1.33 (1.00, 1.77)	2.03 (1.36, 3.04)
	Normal (N=13613)	1.00	1.00	1.00
	Over/Obese (N=4792)	1.11 (0.90, 1.36)	1.26 (1.15, 1.38)	1.25 (1.07, 1.45)
	Missing (N=5176)	1.36 (1.12, 1.66)	0.95 (0.87, 1.05)	1.15 (0.99, 1.33)

Model 1 – Physically bullied (1) = n = 645, physically bullied (0) = n = 23276
Model 2 – Verbally bullied (1) = n = 3722, verbally bullied (0) = n = 20199
Model 3 – Cyberbullied (1) = n = 1238, cyberbullied (0) = n = 22683
Class statement was included to control for clustering by school

Figure 3 Model-based estimated odds ratios for physical bullying for smokers and nonsmokers as a function of being male or female among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

Verbal Bullying

As shown in Table 5, students in grade 9 (OR=1.47, 95%CI 1.32 to 1.64), grade 10 (OR=1.36, 95%CI 1.23 to 1.52), or grade 11 (OR=1.24, 95%CI 1.11 to 1.38) were significantly more likely to get verbally bullied compared to students in grade 12. Females were more likely to get verbally bullied compared to males (OR=1.78, 95%CI 1.66 to 1.92). Students of other races were less likely to get verbally bullied compared to white students (OR=0.84, 95%CI 0.77 to 0.92). Current users of tobacco (OR=1.29, 95%CI 1.10 to 1.50), alcohol (OR=1.28, 95%CI 1.17 to 1.39) and marijuana (OR=1.25, 95%CI 1.13 to 1.39) were more likely to get verbally bullied compared to nonusers. Students with low academic achievement were more likely to get verbally bullied compared to students with high academic achievement (OR=1.31, 95%CI 1.13 to 1.52). Finally, overweight students were more likely to get verbally bullied compared to their normal weight peers (OR=1.26, 95%CI 1.15 to 1.38). Two significant interactions were found for verbal bullying, between gender and alcohol use, as well as between gender and marijuana use, which can be seen in Figures 4 and 5, respectively.

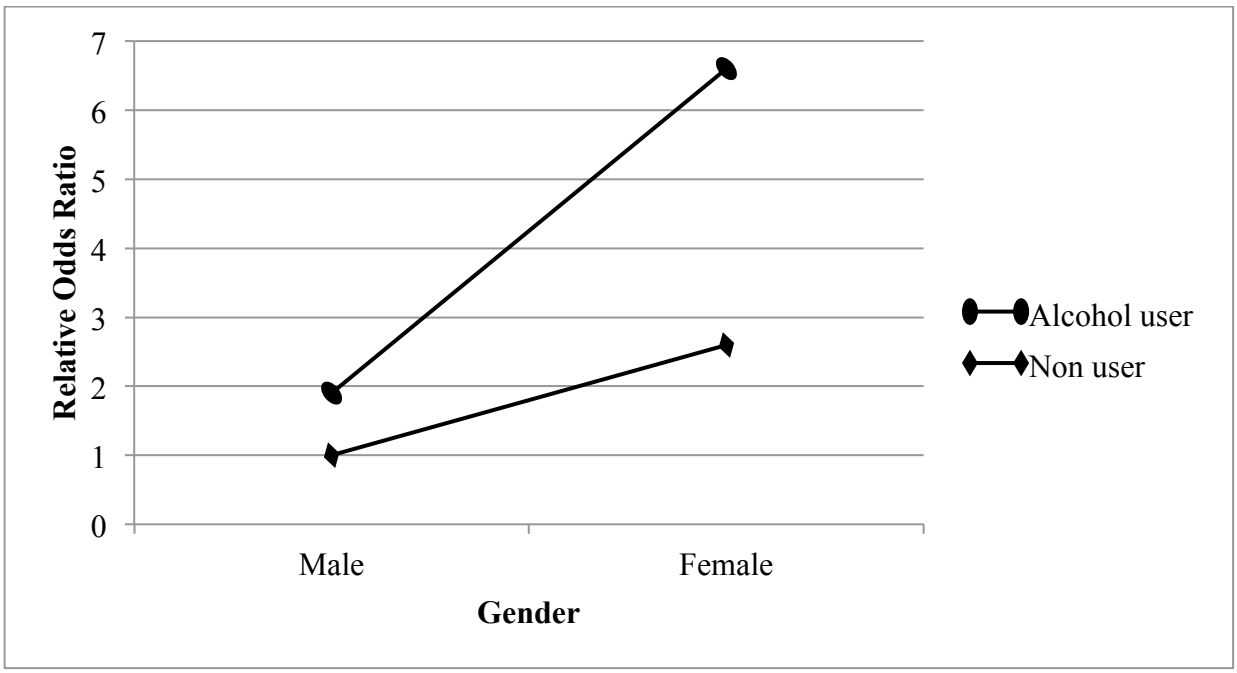

Figure 4 Model-based estimated odds ratios for verbal bullying for alcohol users and non users as a function of being male or female among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

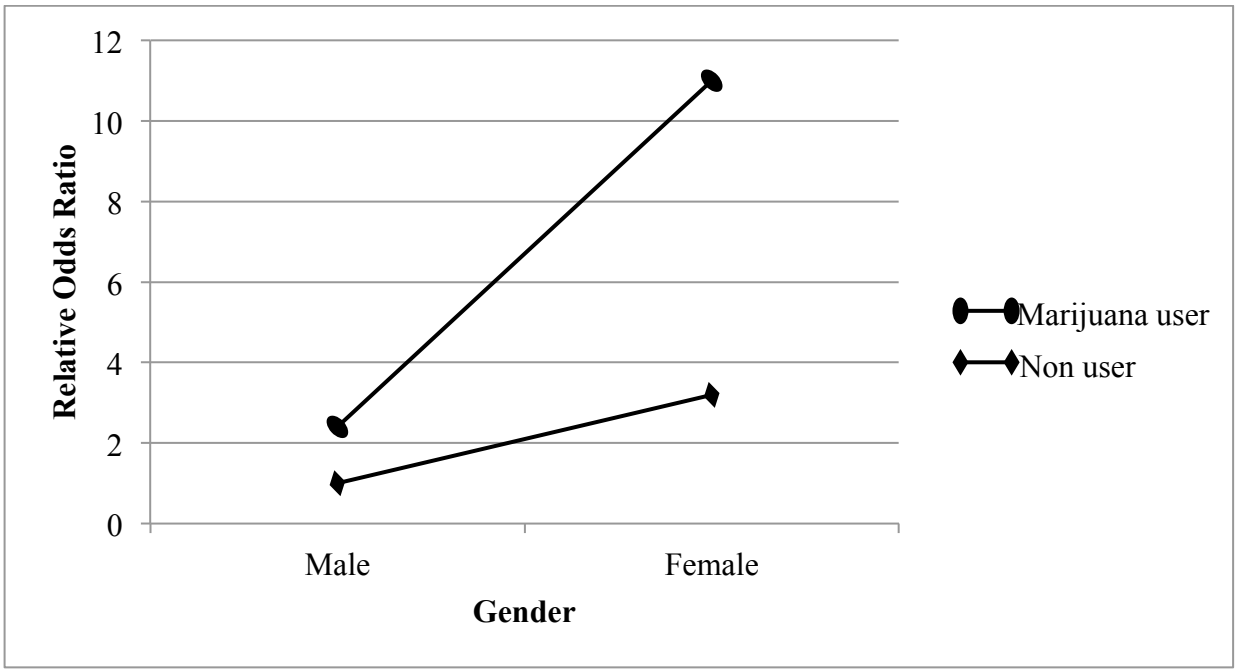

Figure 5 Model-based estimated odds ratios for verbal bullying for marijuana users and non users as a function of being male or female among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

Cyberbullying

As shown in Table 5, students in grade 9 (OR=1.81, 95%CI 1.50 to 2.18), grade 10 (OR=1.56, 95%CI 1.30 to 1.86), or grade 11 (OR=1.31, 95%CI 1.10 TO 1.56) were significantly more likely to get cyberbullied compared to students in grade 12. Females were more likely to get cyberbullied compared to males (OR=3.56, 95%CI 3.12 to 4.08). Current smokers (OR=1.77, 95%CI 1.44 to 2.18) and users of alcohol (OR=1.71, 95%CI 1.49 to 1.96) and marijuana (OR=1.74, 95%CI 1.48 to 2.03) were more likely to get cyberbullied compared to nonusers. Students with low academic achievement were more likely to get cyberbullied compared to students with high academic achievement (OR=1.98, 95%CI 1.60 to 2.44). Finally, underweight (OR=2.03, 95%CI 1.36 to 3.04) and overweight (OR=1.25, 95%CI 1.07 to 1.45) students were more likely to get cyberbullied compared to their normal weight peers. Two significant interactions were found for cyberbullying, between gender and race, as well as between gender and BMI, which can be seen in Figures 6 and 7, respectively.

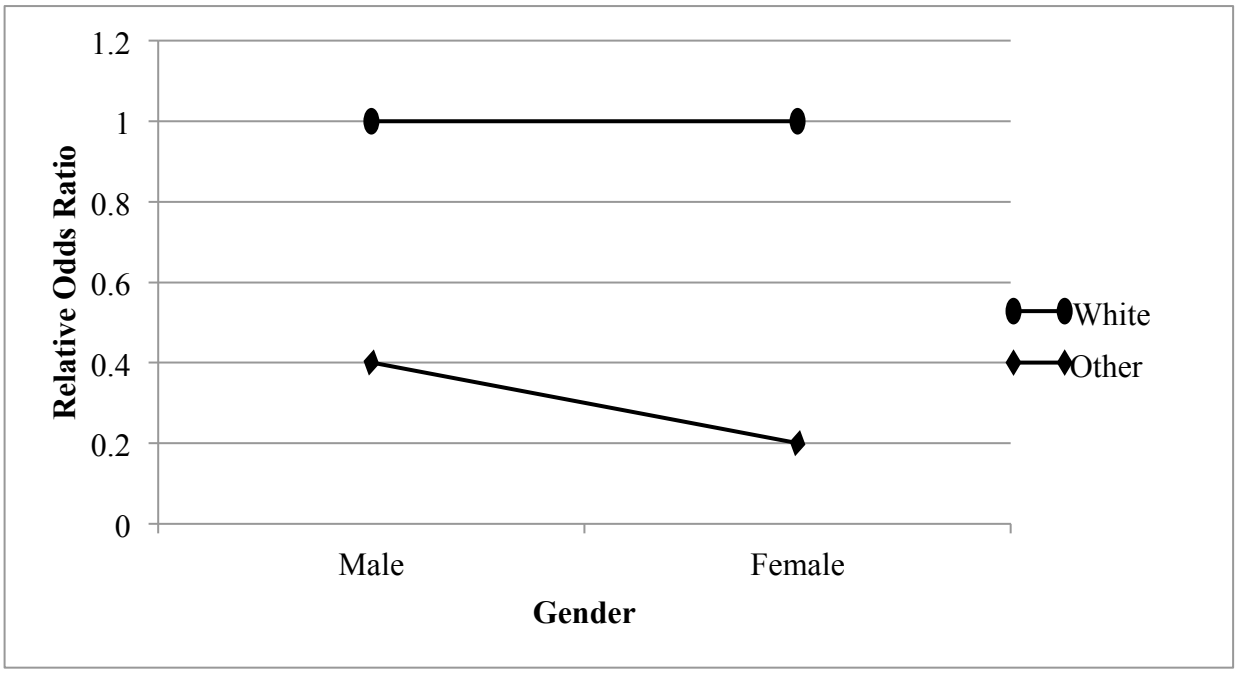

Figure 6 Model-based estimated odds ratios for cyberbullying for white and other races as a function of being male or female among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

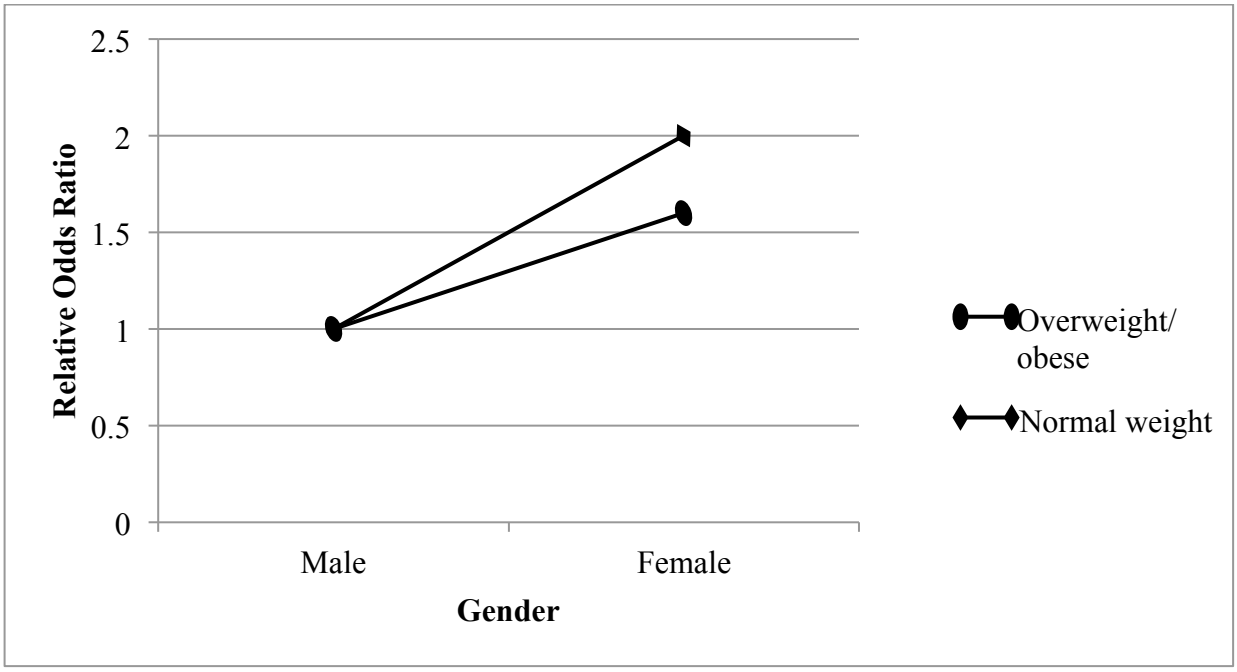

Figure 7 Model-based estimated odds ratios for cyberbullying for overweight/obese and normal weight students as a function of being male or female among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

Additional analyses, that included separate models with each student level characteristic, can be viewed in Appendix C.

6.0 Discussion

6.1 Prevalence of Bullying

The purpose of this study was to examine the prevalence of bullying, as well as student and school level characteristics that predict physical, verbal and cyberbullying behaviour in a sample of high school students in Ontario. This study found that bullying behaviour was a substantial problem among grade 9 to 12 students in the Year 1 COMPASS sample; almost one in four students were involved in bullying in some way (95%CI 23.0% to 24.1%), either as a victim, bully, or bully-victim. This translates into one quarter of the population of Ontario high school students being at higher risk for experiencing various mental health illnesses, such as low self-esteem, depression, and anxiety that are associated with bullying (Haynie & Nansel, 2001; Litwiller & Brausch, 2013; Rigby, 2003). Bullying involvement also leads to long-term social effects, such as difficulties with relationships, unemployment, and criminality in adulthood (Lemstra *et al,* 2011; Seals & Young, 2003). These consequences of bullying in youth populations can have a steep social and economic cost on society, as those involved in bullying are over consumers of society's health and social support systems (CCL, 2008; Olweus, 2013). By targeting bullying with additional prevention efforts, the future burden associated with bullying victimization can potentially be avoided.

As hypothesized, verbal bullying was the most commonly experienced type of bullying, followed by cyber and physical bullying. The overlap of traditional and cyberbullying victims was as expected, approximately one tenth of victims were only cyberbullied (Olweus, 2012; Olweus, 2013). The overall prevalence of bullying, as well as the prevalences found for each type of bullying in this study, with the exception of physical bullying, were lower than those seen in previous Ontario data (Paglia-Boak *et al,* 2012). However, this is most likely not due to lower rates of bullying, but instead due to the difficulties in comparing bullying prevalence across studies. While this study looked at bullying rates in the previous 30 days, the OSDUHS sampled students over the previous year. OSDUHS is also a provincially representative sample.

Based on the results of this research, there is a need to make bullying prevention a larger priority in school-based prevention efforts, to better understand what bullying prevention programs and policies are implemented in schools, and to evaluate bullying prevention programs and policies within the school context. There should be an emphasis on verbal bullying prevention interventions, with less of an emphasis on cyber and physical bullying.

Clear school policies outlining consequences of verbal bullying are of great importance. As there is a large overlap of students who are traditionally bullied and students who are cyberbullied, school policies and interventions will target a majority of victims.

6.2 School Level Characteristics

Among students in the sample, significant between-school random variation in the odds of being bullied was identified for all three types of bullying. This study is the first to identify that the school a student in grade 9 to 12 attends is independently associated with his/her risk of being physically, verbally or cyberbullied. This is an important new finding and provides clear evidence to suggest that school-based prevention interventions are warranted for preventing bullying. As bullying prevalence rates did vary widely across schools, this information may be able to be used to create a standard of what a successful level of bullying in schools may be. Interestingly, none of the simple school-level characteristics examined in this study were able to explain a significant amount of the between school variability identified, suggesting that additional research is required to identify the school-level characteristics that cause this variability. Structural and functional characteristics have not been widely studied but are thought to be important in determining bullying behaviour (Ma, 2001; Paglia-Boak *et al,* 2012; Waters *et al,* 2010). For future research, the school level factors assessed in this thesis should not be considered unimportant, as different ways to measure them do exist. It may be important to consider other school factors as well, such as the presence or absence of school policies around bullying, school sector, student attachment to the school, student-teacher bonding, teacher leadership, and supervision, as these play an important role in successful bullying interventions (Public Safety Canada, 2008).

6.3 Student Level Characteristics

Grade

Students in grade 9, grade 10, and grade 11, were more likely to be bullied compared to students in grade 12, for all types of bullying. The odds ratios also decreased as grade level increased for all three types of bullying. These results were expected, as it is well documented in the literature that bullying behaviour decreases as grade level increases (Carrera *et al,* 2011; Paglia-Boak *et al,* 2012; Volk *et al,* 2012; Wang *et al,* 2009). However, it is interesting to note that when a single variable model was assessed for grade (Appendix C), no grade was significantly more likely to be cyberbullied compared to students in grade 12. This may be due

to conflicting results found in the literature for grade level and cyberbullying. Cyberbullying is thought to have a later peak, as older students tend to have more access to electronic devices with Internet availability (Schneider *et al,* 2012).

The associations with grade level suggest that interventions must start early as students enter high school and prioritize students in grade 9. As students increase in grade level, there may be less of a need to involve them in interventions against bullying, depending on the type of bullying. Physical and verbal bullying interventions should focus on grade 9, grade 10 and grade 11 students. However, with its conflicting results, interventions for cyberbullying should include students in grade 12 as much as students in younger grades. This targeted approach would require evaluation.

Gender

Females were less likely to be physically bullied compared to males. These results were expected, as it is well documented in the literature that physical bullying is more common among males (Hong & Espelage, 2012; Liu & Graves, 2011; Seals & Young, 2003). However, for verbal and cyberbullying, females were two to four times as likely to be bullied compared to males. Again, these results were expected, as previous Ontario data has reported that these behaviours are more common among females (Paglia-Boak *et al,* 2012). These associations indicate that physical bullying prevention interventions should campaign to male students, while verbal and cyberbullying interventions should target females. Again, this type of targeted approach would require evaluation.

Race

The associations with race were quite dissimilar for all three types of bullying. Inconsistent with previous research, students of other races were more likely to be physically bullied compared to white students. While limited research has previously been conducted on bullying and race, it was hypothesized that white students were more likely to be victimized compared to students of other races (Hong & Espelage, 2012; Spriggs *et al,* 2007; Wang *et al,* 2009). These results were consistent for verbal bullying; students of other races were less likely to be victimized by verbal bullying compared to white students. This suggests that prevention interventions for physical bullying should have a specific focus for students of other races, while interventions for verbal bullying should have a specific focus for white students. This targeted approach would require evaluation.

Previous literature is lacking for cyberbullying and how it associated with race. This study found that race was not associated with cyberbullying; no race was more likely to be cyberbullied compared to others. However, a significant interaction for cyberbullying was found between gender and race. Compared to white males, males of other races were less than half as likely to be cyberbullied, while females of other races were less than a quarter times as likely. An interaction between gender and race was previously suggested in the literature, although not specifically for cyberbullying (Vervoort & Scholte, 2010). This interaction shows that white male and female students have the same likelihood of being cyberbullied, but students of other races are less likely to be cyberbullied, female students more so than males. These associations indicate that prevention interventions for cyberbullying should have a focus on white students. This targeted approach would require evaluation.

Disposable Income

Contrary to other studies that looked at SES of parents or the community surrounding youth and youth bullying (Carrera *et al,* 2011), this study identified that the amount of disposable income a student had access to was not associated with bullying. This is an important finding, as it suggests that students do not seem to target bullying at other students based on their own financial situation. As such, future bullying prevention initiatives in schools may want to consider focusing on addressing issues not associated with disposable income.

Tobacco, Alcohol, and Marijuana Use

Consistent with previous research, youth who smoked tobacco, drank alcohol, or smoked marijuana were more likely to be verbally and cyberbullied (Litwiller & Brausch, 2013; Tharp-Taylor *et al,* 2009; Torres *et al,* 2012). However, alcohol use was not significant for physical bullying, which was surprising and inconsistent with previous research. When a single variable model was assessed (Appendix C), alcohol use for physical bullying became significant; students were also almost twice as likely to be physically bullied compared to nonusers. These results suggest that, overall, use of any substance is significantly associated with a greater likelihood of being bullied by all three types of bullying. Bullying interventions should have a specific focus to target substance users. Future research should evaluate the impact that substance use prevention programs have on bullying behaviour. Conversely, research could also evaluate if bullying prevention programs have an impact on reducing substance use.

The results further suggest that the link between substance use and bullying may be gender specific. For instance, a significant interaction for physical bullying was found between gender and tobacco use. Compared to nonsmoking males, nonsmoking females were less likely to be physically bullied. However, compared to nonsmoking males, females who smoked were over two times as likely, and males who smoked were over 12 times as likely to be physically bullied. Two significant interactions for verbal bullying were found between gender and alcohol use, as well as gender and marijuana use. Compared to male nonusers, a pattern was found such that female users of alcohol and marijuana were most likely to be verbally bullied, followed by female nonusers. Male users of alcohol and marijuana were also more likely to be verbally bullied compared to male nonusers. Based on interaction results, a large focus of interventions should especially be put on male smokers for interventions against physical bullying, as well as female users for interventions against verbal bullying. This type of targeted approach would require evaluation.

Academic Achievement

Students with low academic achievement, but not with moderate academic achievement, were more likely to be physically, verbally and cyberbullied compared to students with high academic achievement. Overall, these results were expected, as low academic achievement has been associated with bullying behaviour in previous research (Liu & Graves, 2011). For all physical, verbal, and cyberbullying, students with low academic achievement, but not with moderate academic achievement, were significantly more likely to be bullied compared to students with high academic achievement. These results suggest that there is no gradient effect found between bullying and academic achievement, as is the case with grade level. Instead, it is only those students with low academic achievement who are more likely to be bullied by their peers. Thus, interventions should target low academic achievement students for all three types of bullying. This approach would require evaluation.

Weight Status

Interestingly, the associations with weight status varied by the different types of bullying. Students who were underweight, but not students who were overweight, were two to three times as likely to be physically bullied compared to students of normal weight. When separate analyses were assessed (Appendix C), individuals who did not report their BMI were significantly more likely to be physically bullied compared to their normal weight peers, which

suggests that missing data play an important role in this case. Arbour-Nicitopoulos *et al* (2010) completed a study on learning from non-reported data, specifically on interpreting missing BMI values in youth. The study suggested that students who do not provide enough data for BMI calculations are more apt to be heavier. This implies that, although associations for overweight youth regarding physical and cyberbullying were not significant, they may still be more likely to be bullied. However, as males were more likely to be physically bullied, it is not surprising that underweight males were more likely to be physically bullied, compared to normal weight males, as they are easier targets. Both underweight and overweight students were more likely to be bullied compared to their normal weight peers. It is interesting that underweight students are more likely to be cyberbullied, as previous research has only found an interaction with underweight males being more likely to be physically bullied (Brixval *et al,* 2011). Oppositely, students who were overweight, but not students who were underweight, were more likely to be verbally bullied compared to students of normal weight. These results were expected, as verbal bullying has been found to be especially common among overweight individuals in the literature (Fox & Farrow, 2009).

There was no significant interaction found between gender and weight status for physical and verbal bullying, which could be due to females being more likely to not report their weight (Fox & Farrow, 2009). However, there was a significant interaction for cyberbullying found between gender and BMI that was not as suggested by previous research. Compared to normal weight males, overweight/obese males were approximately just as likely to be cyberbullied; however, normal weight females were 1.5 times as likely to be cyberbullied, and overweight/obese females were almost twice as likely to be cyberbullied. The findings in this thesis do not support the notion that underweight males, and overweight females, are more likely to be bullied. Based on these results, prevention interventions for physical bullying should target underweight individuals, while interventions for verbal bullying should target overweight/obese individuals. Interventions for cyberbullying should target underweight individuals, but should also have a special focus for overweight females. As results in this study may have been affected by missing data of overweight individuals, interventions for all types of bullying should not exempt overweight students. This type of targeted approach would require evaluation.

6.4 Implications for Research

Future research on factors that predict bullying behaviour should include longitudinal data that would allow causality to be determined. As host study for this research, the COMPASS study, is a four-year longitudinal study that has just begun, data will be available in the coming years (http://www.compass.uwaterloo.ca/). Furthermore, this study looked at student and school level factors that predict which students are victims of bullying. Future research should focus on student and school level characteristics that predict which students are bullies. Additional analyses, such as differences between students involved in relational bullying, based on their frequency of involvement in bullying (less than once a week, once a week, two or three times a week, etc), or based on other involvement types (bystanders, etc) should also be determined.

Additional research is required to identify the school-level characteristics that cause between-school random variation in the odds of being bullied, such as the presence or absence of school policies around bullying, school sector, student attachment to the school, student-teacher bonding, teacher leadership, and supervision, as these play an important role in successful bullying interventions (Public Safety Canada, 2008). Future research should also look at additional student level characteristics. A direct measure of SES and how it relates to the likelihood of being involved in bullying should be determined. Future research should complete separate analyses for different ethnic groups to determine specific differences between them, or look at different sexual orientations. Finally, other interactions that may exist should be determined for student level variables other than interactions with gender.

6.5 Implications for Policy and Practice

Previous research indicates that bullying interventions need to be gender and age specific, and target multiple risk and protective factors. Unsuccessful bullying interventions only provide programming targeted at the entire school population, are more likely to focus on students who bully, instead of students who are bullied, and are less likely to be evaluated. This thesis specifically outlines how bullied students should be targeted for intervention based on grade and gender, as well as many other risk and protective factors, such as race, disposable income, tobacco, alcohol and marijuana use, academic achievement, and weight status, for three different types of bullying. The results from this thesis can also be used as an educational component to train school staff and other stakeholders so they are aware of students who may

be more likely to be bullied. Training will develop a deeper awareness and understanding of bullying in schools, as well as help staff identify students who may be a victim of bullying. Furthermore, measures of academic achievement, which are readily available to teachers and school administrators, can be used as bullying monitoring indicators.

6.6 Strengths and Limitations

This study, and much of the literature on bullying, used cross-sectional data, which made causal or temporal inferences impossible to determine. Thus, a significant association could not find what caused what, whether the association was bi-directional, or whether a third variable caused both studied variables (Rigby, 2003). Future research should focus on better understanding causality between bullying and its correlates. Longitudinal studies would be helpful in gaining insight into short- and long-term predictors and outcomes for students (Liu & Graves, 2011).

Another limitation is that this study used self-report questionnaires. Self-report measures are subject to misclassification and risk over- or under-reporting (Radliff *et al*, 2012). For example, the use of self-report questionnaires may have produced certain amounts of social desirability bias when addressing violent content, which may have resulted in under reporting. Researchers have found that victimized students may not report bullying due to fear of retaliation (Beran & Lupart, 2009). Also, students may be reluctant to disclose victimization if they feel they should be able to manage it (Beran *et al*, 2012). Furthermore, selection bias may have occurred given that the students were surveyed at school. It is possible that rates of bullying are underestimated if absenteeism is a consequence of bullying (Beran *et al*, 2012). Self-report data would be improved through multi-method assessment; however, this was not feasible given the design of the study.

The self-report questionnaire used gave respondents no definition of bullying, thus the subjective interpretation could have increased variability in the study. However, the questionnaire did provide examples for each type of bullying (Solberg & Olweus, 2003). The questionnaire also did not measure relational bullying. Relational bullying is as important type of bullying to consider when discussing school and student level characteristics, thus this is a major flaw of the study. A measure of relational bullying and how it associated with gender would have been interesting in this study particularly, as gender results were surprising in this study. Analyses also used categorical, rather than continuous data. Certain categories, such as in the case of race and BMI, were collapsed to assure sufficient power in analyses. Therefore, this study does not look at differences that could

exist between various ethnic groups, as well as differences between overweight and obese students. Finally, this sample was not representative of Ontario high schools, and only included one province in the country of Canada. Thus, generalizability to other populations may be limited.

Despite these limitations, the study has several unique strengths. While self-report questionnaire have their limitations, this study used a single, self-report, variable item with specific response alternatives, which is thought to be the method of choice (Solberg & Olweus, 2003). The data for this study was collected anonymously, which may have mitigated some potential biases that could have occurred (Radliff *et al*, 2012). The sample was large and diverse with a high response rate and a wide range of measures that examined students in high school, which is an area in need of research, especially in Canada. Finally, the multilevel approach allowed for the test of school level differences while controlling for individual factors.

6.7 Conclusion

Recently in North America, school bullying has gained attention among the media, school authorities, and parents concerned about students' well-being and safety. School bullying is a major social problem and public health issue that can lead to serious and lasting harm for all parties involved. This study was no exception, the prevalence of bullying behaviour was found to be a substantial problem in Ontario high school youth. Student and school level characteristics, and how they are associated with each type of bullying behaviour, were outlined and assessed in this study. If the characteristics that either predispose or protect students from bullying could be better understood, successful preventions or intervention strategies in schools can be developed to prevent negative health outcomes from occurring.

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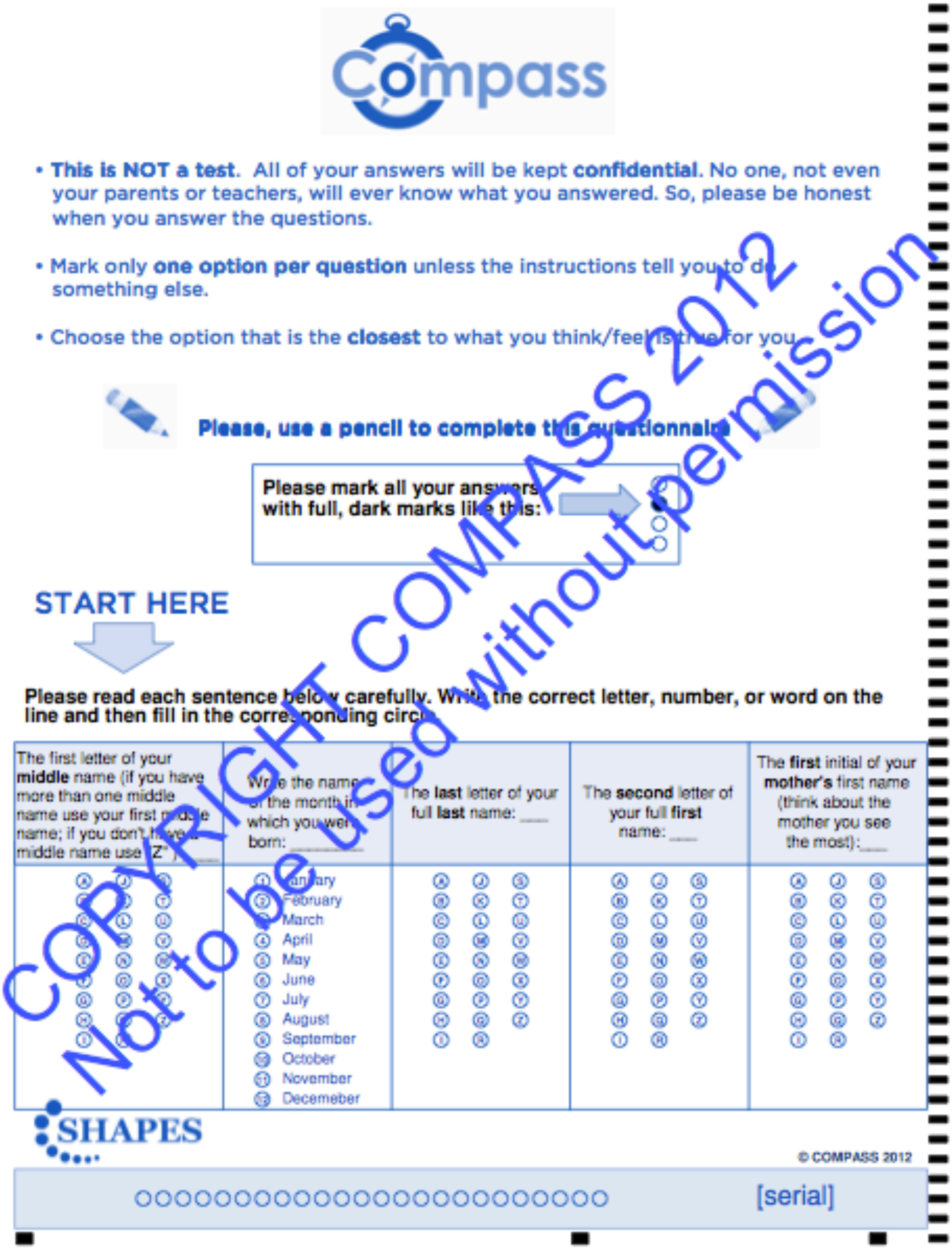
Appendices

List of Appendices

Appendix A: COMPASS Student Level Questionnaire



Compass

- **This is NOT a test.** All of your answers will be kept **confidential**. No one, not even your parents or teachers, will ever know what you answered. So, please be honest when you answer the questions.
- Mark only **one option per question** unless the instructions tell you to do something else.
- Choose the option that is the **closest** to what you think/feel is true for you.

Please, use a pencil to complete this questionnaire

Please mark all your answers with full, dark marks like this: ○ ● ○ ○

START HERE

Please read each sentence below carefully. Write the correct letter, number, or word on the line and then fill in the corresponding circle.

The first letter of your **middle** name (if you have more than one middle name use your first middle name; if you don't have a middle name use "Z") ___	Write the name of the month in which you were born: ________	The **last** letter of your full **last** name: ___	The **second** letter of your full **first** name: ___	The **first** initial of your **mother's** first name (think about the mother you see the most): ___
Ⓐ Ⓙ Ⓢ Ⓑ Ⓚ Ⓣ Ⓒ Ⓛ Ⓤ Ⓓ Ⓜ Ⓥ Ⓔ Ⓝ Ⓦ Ⓕ Ⓞ Ⓧ Ⓖ Ⓟ Ⓨ Ⓗ Ⓠ Ⓩ Ⓘ Ⓡ	① January ② February ③ March ④ April ⑤ May ⑥ June ⑦ July ⑧ August ⑨ September ⑩ October ⑪ November ⑫ Decemeber	Ⓐ Ⓙ Ⓢ Ⓑ Ⓚ Ⓣ Ⓒ Ⓛ Ⓤ Ⓓ Ⓜ Ⓥ Ⓔ Ⓝ Ⓦ Ⓕ Ⓞ Ⓧ Ⓖ Ⓟ Ⓨ Ⓗ Ⓠ Ⓩ Ⓘ Ⓡ	Ⓐ Ⓙ Ⓢ Ⓑ Ⓚ Ⓣ Ⓒ Ⓛ Ⓤ Ⓓ Ⓜ Ⓥ Ⓔ Ⓝ Ⓦ Ⓕ Ⓞ Ⓧ Ⓖ Ⓟ Ⓨ Ⓗ Ⓠ Ⓩ Ⓘ Ⓡ	Ⓐ Ⓙ Ⓢ Ⓑ Ⓚ Ⓣ Ⓒ Ⓛ Ⓤ Ⓓ Ⓜ Ⓥ Ⓔ Ⓝ Ⓦ Ⓕ Ⓞ Ⓧ Ⓖ Ⓟ Ⓨ Ⓗ Ⓠ Ⓩ Ⓘ Ⓡ

SHAPES

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About You

1. What grade are you in?

- ○ Grade 9
- ○ Grade 10
- ○ Grade 11
- ○ Grade 12

2. How old are you today?

- ○ 13 years or younger
- ○ 14 years
- ○ 15 years
- ○ 16 years
- ○ 17 years
- ○ 18 years or older

3. Are you female or male?

- ○ Female
- ○ Male

4. How would you describe yourself? *(Mark all that apply)*

- ○ White
- ○ Black
- ○ Asian
- ○ Aboriginal (First Nations, Métis, Inuit)
- ○ Latin American/Hispanic
- ○ Other _____

5. About how much money do you usually get each week to spend on yourself or to save?
(Remember to include all money from allowances and jobs like baby-sitting, delivering papers, etc.)

- ○ Zero
- ○ $1 to $5
- ○ $6 to $10
- ○ $11 to $20
- ○ $21 to $40
- ○ $41 to $100
- ○ More than $100
- ○ I do not know how much money I get each week

6. How do you usually travel to and from school?

To school	From school
○ By car (as a passenger)	○ By car (as a passenger)
○ By car (as a driver)	○ By car (as a driver)
○ By school bus	○ By school bus
○ By public bus	○ By public bus
○ By walking	○ By walking
○ By bicycling	○ By bicycling
○ By subway or streetcar	○ By subway or streetcar
○ Other_____	○ Other_____

7. How tall are you without your shoes on? (Please write your height in feet and inches **OR** in centimetres, and then fill in the appropriate numbers for your height.)

○ **I do not know how tall I am**

"My height is ____ feet ____ inches"

OR

"My height is _____ centimetres"

Height — Feet | Inches

OR

Height — Centimetres

Example: My height is 5 ft 7 in — Height — Feet | Inches

8. How much do you weigh without your shoes on? (Please write your weight in pounds **OR** in kilograms, and then fill in the appropriate numbers for your weight.)

○ **I do not know how much I weigh**

"My weight is _____ pounds"

OR

"My weight is _____ kilograms"

Weight — Pounds

OR

Weight — Kilograms

Example: My weight is 127 lbs — Weight — Pounds

9. How much time per day do you *usually* spend doing the following activities?

For example: If you spend about 3 hours watching TV each day, you will need to fill in the 3 hour circle, and the 0 minute circle as shown below:

	Hours	Minutes
a) Watching/streaming TV shows or movies	●	●

	Hours	Minutes
a) Watching/streaming TV shows or movies		
b) Playing video/computer games		
c) Doing homework		
d) Talking on the phone		
e) Surfing the internet		
f) Texting, messaging, emailing (note: 50 texts = 30 minutes)		
g) Sleeping		

○○○○○○○○○○○○○○○○○○○○○○○○○○ [serial]

Physical Activity

HARD physical activities include jogging, team sports, fast dancing, jump-rope and any other physical activities that increase your heart rate and make you breathe hard and sweat.

MODERATE physical activities include lower intensity activities such as walking, biking to school, and recreational swimming.

10. Mark how many minutes of HARD physical activity you did on each of the last 7 days. This includes physical activity during physical education class, lunch, after school, evenings, and spare time.

	Hours					Minutes			
Monday	0	1	2	3	4	0	15	30	45
Tuesday	0	1	2	3	4	0	15	30	45
Wednesday	0	1	2	3	4	0	15	30	45
Thursday	0	1	2	3	4	0	15	30	45
Friday	0	1	2	3	4	0	15	30	45
Saturday	0	1	2	3	4	0	15	30	45
Sunday	0	1	2	3	4	0	15	30	45

For example: If you did 45 minutes of hard physical activity on Monday, you will need to fill in the 0 hour circle and the 45 minute circle, as shown below:

	Hours					Minutes			
Monday	●	1	2	3	4	0	15	30	●

11. Mark how many minutes of MODERATE physical activity you did on each of the last 7 days. This includes physical activity during physical education class, lunch, after school, evenings, and spare time. Do not include time spent doing hard physical activities.

	Hours					Minutes			
Monday	0	1	2	3	4	0	15	30	45
Tuesday	0	1	2	3	4	0	15	30	45
Wednesday	0	1	2	3	4	0	15	30	45
Thursday	0	1	2	3	4	0	15	30	45
Friday	0	1	2	3	4	0	15	30	45
Saturday	0	1	2	3	4	0	15	30	45
Sunday	0	1	2	3	4	0	15	30	45

For example: If you did 1 hour and 30 minutes of moderate physical activity on Monday, you will need to fill in the 1 hour circle and the 30 minute circle, as shown below:

	Hours					Minutes			
Monday	0	●	2	3	4	0	15	●	45

12. Were the last 7 days a typical week in terms of the amount of physical activity that you usually do?

- ○ Yes
- ○ No, I was *more* active in the last 7 days
- ○ No, I was *less* active in the last 7 days

13. Your closest friends are the friends you like to spend the most time with. How many of your closest friends are physically active?

- ○ None
- ○ 1 friend
- ○ 2 friends
- ○ 3 friends
- ○ 4 friends
- ○ 5 or more friends

14. Are you taking a physical education class at school this year?

- ○ **Yes,** I am taking one **this term**
- ○ **Yes,** I will be taking one or have taken one this school year, **but not this term.**
- ○ **No,** I am not taking a physical education class at school this year

15. Do you participate in before-school, noon hour, or after-school physical activities organized by your school? *(e.g., intramurals, non-competitive clubs)*

- ○ Yes
- ○ No
- ○ None offered at my school

16. Do you participate in competitive school sports teams that compete against other schools? *(e.g., junior varsity or varsity sports)*

- ○ Yes
- ○ No
- ○ None offered at my school

17. Do you participate in league or team sports outside of school?

- ○ Yes
- ○ No
- ○ There are none available where I live

18. On how many days in the last 7 days did you do exercises to strengthen or tone your muscles? *(e.g., push-ups, sit-ups, or weight-training)*

- ○ 0 days
- ○ 1 day
- ○ 2 days
- ○ 3 days
- ○ 4 days
- ○ 5 days
- ○ 6 days
- ○ 7 days

19. How do you describe your weight?

- ○ Very underweight
- ○ Slightly underweight
- ○ About the right weight
- ○ Slightly overweight
- ○ Very overweight

20. Which of the following are you trying to do about your weight?

- ○ **Lose** weight
- ○ **Gain** weight
- ○ **Stay** the same weight
- ○ I am **not trying to do anything** about my weight

21. How much do your parents, step-parents, or guardians encourage you to be physically active?

- ○ Strongly encourage
- ○ Encourage
- ○ Do not encourage or discourage
- ○ Discourage
- ○ Strongly discourage

22. How much do your parents, step-parents, or guardians support you in being physically active? *(e.g., driving you to team games, buying you sporting equipment)*

- ○ Very supportive
- ○ Supportive
- ○ Unsupportive
- ○ Very unsupportive

○○○○○○○○○○○○○○○○○○○○○○○○○○ [serial]

Healthy Eating

23. If you do not eat breakfast every day, why do you skip breakfast? *(Mark all that apply)*

- ○ I eat breakfast every day
- ○ I don't have time for breakfast
- ○ The bus comes too early
- ○ I sleep in
- ○ I'm not hungry in the morning
- ○ I feel sick when I eat breakfast
- ○ I'm trying to lose weight
- ○ There is nothing to eat at home
- ○ Other _____

24. In a *usual* school week *(Monday to Friday)*, on how many days do you do the following?

	None	1 day	2 days	3 days	4 days	5 days
a) Eat breakfast	○	○	○	○	○	○
b) Eat breakfast provided to you **as part of a school program**	○	○	○	○	○	○
c) Eat lunch at school - lunch packed and brought from home	○	○	○	○	○	○
d) Eat lunch at school - lunch purchased in the cafeteria	○	○	○	○	○	○
e) Eat lunch purchased at a fast food place or restaurant	○	○	○	○	○	○
f) Eat snacks purchased from a vending machine **in your school**	○	○	○	○	○	○
g) Eat snacks purchased from a vending machine, corner store, snack bar, or canteen **off school property**	○	○	○	○	○	○
h) Drink sugar-sweetened beverages (soda pop, Kool-Aid, Gatorade, etc.) Do not include diet/sugar-free drinks	○	○	○	○	○	○
i) Drink high-energy drinks (Red Bull, Monster, Rock Star, etc.)	○	○	○	○	○	○
j) Drink coffee or tea **with sugar** (include cappuccino, frappuccino, iced-tea, iced-coffees, etc.)	○	○	○	○	○	○
k) Drink coffee or tea **without sugar**	○	○	○	○	○	○

25. On a *usual* weekend *(Saturday and Sunday)*, on how many days do you do the following?

	None	1 day	2 days
a) Eat breakfast	○	○	○
b) Eat lunch	○	○	○
c) Eat foods purchased at a fast food place or restaurant	○	○	○
d) Eat snacks purchased from a vending machine, corner store, snack bar, or canteen	○	○	○
e) Drink sugar-sweetened beverages (soda pop, Kool-Aid, Gatorade, etc.) Do not include diet/sugar-free drinks	○	○	○
f) Drink high energy drinks (Red Bull, Monster, Rock Star, etc.)	○	○	○
g) Drink coffee or tea **with sugar** (include cappuccino, frappuccino, iced-tea, iced-coffees, etc.)	○	○	○
h) Drink coffee or tea **without sugar**	○	○	○

26. YESTERDAY, ***from the time you woke up until the time you went to bed,*** **how many servings of meats and alternatives did you have?** *One 'Food Guide' serving of meat and alternatives includes cooked fish, chicken, beef, pork, or game meat, eggs, nuts or seeds, peanut butter or nut butters, legumes (beans), and tofu.*

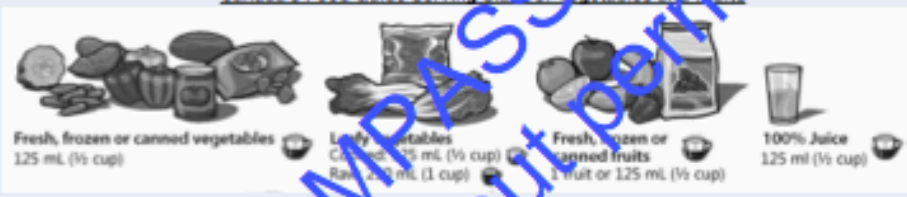
- ○ None
- ○ 1 serving
- ○ 2 servings
- ○ 3 servings
- ○ 4 servings
- ○ 5 or more servings

Canada's Food Guide Serving Sizes of Meats and Alternatives

27. YESTERDAY, ***from the time you woke up until the time you went to bed,*** **how many servings of vegetables and fruits did you have?** *One 'Food Guide' serving of vegetables and fruit includes pieces of fresh vegetable or fruit, salad or raw leafy greens, cooked leafy green vegetables, dried or canned or frozen fruit, and 100% fruit or vegetable juice.*

- ○ None
- ○ 1 serving
- ○ 2 servings
- ○ 3 servings
- ○ 4 servings
- ○ 5 servings
- ○ 6 servings
- ○ 7 servings
- ○ 8 servings
- ○ 9 or more servings

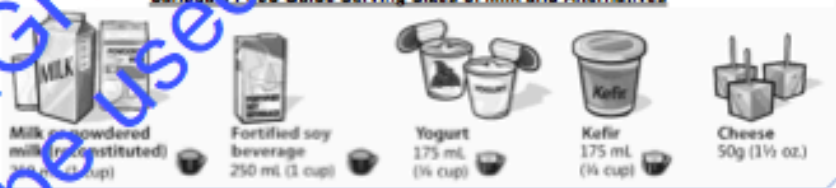
Canada's Food Guide Serving Sizes of Vegetables and Fruit



28. YESTERDAY, ***from the time you woke up until the time you went to bed,*** **how many servings of milk and alternatives did you have?** *One 'Food Guide' serving of milk or milk alternatives includes milk, fortified soy beverage, reconstituted powdered milk, canned (evaporated) milk, yogurt or kefir (another type of cultured milk product), and cheese.*

- ○ None
- ○ 1 serving
- ○ 2 servings
- ○ 3 servings
- ○ 4 servings
- ○ 5 servings
- ○ 6 or more servings

Canada's Food Guide Serving Sizes of Milk and Alternatives



29. YESTERDAY, ***from the time you woke up until the time you went to bed,*** **how many servings of grain products did you have?** *One 'Food Guide' serving of grain products includes bread, bagels, flatbread such as tortilla, pita, cooked rice or pasta, and cold cereal.*

- ○ None
- ○ 1 serving
- ○ 2 servings
- ○ 3 servings
- ○ 4 servings
- ○ 5 servings
- ○ 6 servings
- ○ 7 servings
- ○ 8 servings
- ○ 9 or more servings

Canada's Food Guide Serving Sizes of Grain Products

Your Experience with Smoking

30. Have you ever tried cigarette smoking, even just a few puffs?

- ○ Yes
- ○ No

31. How old were you when you first tried smoking cigarettes, even just a few puffs?

- ○ I have never done this
- ○ I do not know

- ○ 8 years or younger
- ○ 9 years
- ○ 10 years
- ○ 11 years
- ○ 12 years
- ○ 13 years
- ○ 14 years
- ○ 15 years
- ○ 16 years
- ○ 17 years
- ○ 18 years or older

32. Do you think in the future you might try smoking cigarettes?

- ○ Definitely yes
- ○ Probably yes
- ○ Probably not
- ○ Definitely not

33. If one of your best friends was to offer you a cigarette, would you smoke it?

- ○ Definitely yes
- ○ Probably yes
- ○ Probably not
- ○ Definitely not

34. At any time during the next year do you think you will smoke a cigarette?

- ○ Definitely yes
- ○ Probably yes
- ○ Probably not
- ○ Definitely not

35. Do you think it would be difficult or easy for you to get cigarettes if you wanted to smoke?

- ○ Difficult
- ○ Easy
- ○ I do not know

36. Have you ever smoked a whole cigarette?

- ○ Yes
- ○ No

37. Have you ever smoked 100 or more whole cigarettes in your life?

- ○ Yes
- ○ No

○○○○○○○○○○○○○○○○○○○○○○○○○ [serial]

38. Have you ever smoked every day for at least 7 days in a row?

- ○ Yes
- ○ No

39. On how many of the last 30 days did you smoke one or more cigarettes?

- ○ None
- ○ 1 day
- ○ 2 to 3 days
- ○ 4 to 5 days
- ○ 6 to 10 days
- ○ 11 to 20 days
- ○ 21 to 29 days
- ○ 30 days *(every day)*

40. Thinking back over the last 30 days, on the days that you smoked, how many cigarettes did you usually smoke each day?

- ○ None
- ○ A few puffs to one whole cigarette
- ○ 2 to 3 cigarettes
- ○ 4 to 5 cigarettes
- ○ 6 to 10 cigarettes
- ○ 11 to 20 cigarettes
- ○ 21 to 29 cigarettes
- ○ 30 or more cigarettes

41. Your closest friends are the friends you like to spend the most time with. How many of your closest friends smoke cigarettes?

- ○ None
- ○ 1 friend
- ○ 2 friends
- ○ 3 friends
- ○ 4 friends
- ○ 5 or more friends

42. Have you ever tried to quit smoking cigarettes?

- ○ I have never smoked
- ○ I have only smoked a few times
- ○ I have never tried to quit
- ○ I have tried to quit once
- ○ I have tried to quit 2 or 3 times
- ○ I have tried to quit 4 or 5 times
- ○ I have tried to quit 6 or more times

43. In the last 30 days, did you use any of the following? *(Mark all that apply)*

- ○ Pipe tobacco
- ○ Cigarillos or little cigars (*plain or flavoured*)
- ○ Cigars (not including cigarillos or little cigars, *plain or flavoured*)
- ○ Roll-your-own cigarettes (tobacco only)
- ○ Loose tobacco mixed with marijuana
- ○ Bidis (little flavoured cigarettes that are hand-rolled in leaves and tied at the ends with string)
- ○ Smokeless tobacco (chewing tobacco, pinch, snuff, or snus)
- ○ Nicotine patches, nicotine gum, nicotine lozenges, or nicotine inhalers
- ○ Hookah (water-pipe) to smoke tobacco
- ○ Hookah (water-pipe) to smoke herbal sheesha/shisha
- ○ Blunt wraps (a sheet or tube made of tobacco used to roll cigarette tobacco)
- ○ I have not used any of these things in the last 30 days

Alcohol and Marijuana Use

*Please remember that we will keep your answers **completely confidential**.*

A **DRINK** means: 1 regular sized bottle, can, or draft of beer; 1 glass of wine; 1 bottle of cooler; 1 shot of liquor (rum, whiskey, etc); or 1 mixed drink (1 shot of liquor with pop, juice, energy drink).

44. In the last 12 months, how often did you have a drink of alcohol that was more than just a sip?

- ○ I have never drunk alcohol
- ○ I did not drink alcohol in the last 12 months
- ○ I have only had a sip of alcohol
- ○ Less than once a month
- ○ Once a month
- ○ 2 or 3 times a month
- ○ Once a week
- ○ 2 or 3 times a week
- ○ 4 to 6 times a week
- ○ Every day

45. How old were you when you first had a drink of alcohol that was more than just a sip?

- ○ I have never drunk alcohol
- ○ I have only had a sip of alcohol
- ○ I do not know
- ○ 8 years or younger
- ○ 9 years
- ○ 10 years
- ○ 11 years
- ○ 12 years
- ○ 13 years
- ○ 14 years
- ○ 15 years
- ○ 16 years
- ○ 17 years
- ○ 18 years or older

46. In the last 12 months, how often did you have 5 drinks of alcohol or more on one occasion?

- ○ I have never done this
- ○ I did not have 5 or more drinks on one occasion in the last 12 months
- ○ Less than once a month
- ○ Once a month
- ○ 2 to 3 times a month
- ○ Once a week
- ○ 2 to 5 times a week
- ○ Daily or almost daily

47. In the last 12 months, have you had alcohol mixed or pre-mixed with an energy drink such as Red Bull, Rock Star, Monster, or another brand?

- ○ I have never done this
- ○ I did not do this in the last 12 months
- ○ Yes
- ○ I do not know

48. In the last 12 months, how often did you use marijuana or cannabis? (a joint, pot, weed, hash)

- ○ I have never used marijuana
- ○ I have used marijuana but not in the last 12 months
- ○ Less than once a month
- ○ Once a month
- ○ 2 or 3 times a month
- ○ Once a week
- ○ 2 or 3 times a week
- ○ 4 to 6 times a week
- ○ Every day

49. How old were you when you first used marijuana or cannabis?

- ○ I have never used marijuana
- ○ I do not know
- ○ 8 years or younger
- ○ 9 years
- ○ 10 years
- ○ 11 years
- ○ 12 years
- ○ 13 years
- ○ 14 years
- ○ 15 years
- ○ 16 years
- ○ 17 years
- ○ 18 years or older

50. Do you think it would be difficult or easy for you to get marijuana if you wanted some?

- ○ Difficult
- ○ Easy
- ○ I do not know

○○○○○○○○○○○○○○○○○○○○○○○○○ [serial]

Your School and You

51. How strongly do you agree or disagree with each of the following?

	Strongly Agree	Agree	Disagree	Strongly Disagree
a) I feel close to people at my school.	○	○	○	○
b) I feel I am part of my school.	○	○	○	○
c) I am happy to be at my school.	○	○	○	○
d) I feel the teachers at my school treat me fairly.	○	○	○	○
e) I feel safe in my school.	○	○	○	○
f) Getting good grades is important to me.	○	○	○	○

52. In the last 30 days, in what ways were you bullied by other students? *(Mark all that apply)*

- ○ I have not been bullied in the last 30 days
- ○ Physical attacks (e.g., getting beaten up, pushed, or kicked)
- ○ Verbal attacks (e.g., getting teased, threatened, or having rumours spread about you)
- ○ Cyber-attacks (e.g., being sent mean text messages or having rumours spread about you on the internet)
- ○ Had someone steal from you or damage your things

53. In the last 30 days, how often have you been bullied by other students?

- ○ I have not been bullied by other students in the last 30 days
- ○ Less than once a week
- ○ About once a week
- ○ 2 or 3 times a week
- ○ Daily or almost daily

54. In the last 30 days, in what ways did you bully other students? *(Mark all that apply)*

- ○ I did not bully other students in the last 30 days
- ○ Physical attacks (e.g., beat up, pushed, or kicked them)
- ○ Verbal attacks (e.g., teased, threatened, or spread rumours about them)
- ○ Cyber-attacks (e.g., sent mean text messages or spread rumours about them on the internet)
- ○ Stole from them or damaged their things

55. In the last 30 days, how often have you taken part in bullying other students?

- ○ I did not bully other students in the last 30 days
- ○ Less than once a week
- ○ About once a week
- ○ 2 or 3 times a week
- ○ Daily or almost daily

56. How supportive is your school of the following?

	Very supportive	Supportive	Unsupportive	Very unsupportive
a) Making sure there are opportunities for students to be physically active	○	○	○	○
b) Making sure students have access to healthy foods and drinks	○	○	○	○
c) Making sure no one is bullied at school	○	○	○	○
d) Giving students the support they need to resist or quit tobacco	○	○	○	○
e) Giving students the support they need to resist or quit drugs and/or alcohol	○	○	○	○

57. What academic level was your current or most recent Math course?

- ○ Applied
- ○ Academic
- ○ Other _____

58. In your current or most recent Math course, what is your approximate overall mark?
(Think about last year if you have not taken math yet this year)

- 90% - 100%
- 80% - 89%
- 70% - 79%
- 60% - 69%
- 55% - 59%
- 50% - 54%
- Less than 50%

59. In your current or most recent English course, what is your approximate overall mark?
(Think about last year if you have not taken English yet this year)

- 90% - 100%
- 80% - 89%
- 70% - 79%
- 60% - 69%
- 55% - 59%
- 50% - 54%
- Less than 50%

60. What is the highest level of education you would like to get?

- Some high school or less
- High school diploma or graduation equivalency
- College/trade/vocational certificate
- University Bachelor's degree
- University Master's / PhD / law school / medical school / teachers' college degree
- I don't know

61. What is the highest level of education you think you will get?

- Some high school or less
- High school diploma or graduation equivalency
- College/trade/vocational certificate
- University Bachelor's degree
- University Master's / PhD / law school / medical school / teachers' college degree
- I don't know

62. In the last 4 weeks, how many days of school did you miss because of your health?

- 0 days
- 1 or 2 days
- 3 to 5 days
- 6 to 10 days
- 11 or more days

63. In the last 4 weeks, how many classes did you skip when you were not supposed to?

- 0 classes
- 1 or 2 classes
- 3 to 5 classes
- 6 to 10 classes
- 11 to 20 classes
- More than 20 classes

64. How often do you go to class without your homework complete?

- Never
- Seldom
- Often
- Usually

○○○○○○○○○○○○○○○○○○○○○○○○○ [serial]

Appendix B: COMPASS School Level Questionnaire

School Policies and Practices Questionnaire

General School Health Questions:

1. **What financial resources are available annually from your school board to support efforts to improve the health of students at your school?**

		Yes	No
a.	Budget		
	i. Annual budget less than $100	o	o
	ii. Annual budget $100 - $499	o	o
	iii. Annual budget $500 - $999	o	o
	iv. Annual budget greater than $1000	o	o
b.	Staff time (e.g., for professional development, monitoring of policy compliance, etc.)	o	o
c.	Space	o	o

2. **Does your school use formal or standardized student health assessments to determine students' attitudes, knowledge, beliefs, and behaviours on the following topics?**

Examples of formal or standardized student assessments are: SHAPES student survey, Youth Smoking Survey, Ontario Student Drug Use and Health Survey (OSDUHS)

		At least every 2 years	Less than every 2 years	Irregularly	Never
a.	Healthy Eating	o	o	o	o
b.	Physical Activity	o	o	o	o
c.	Tobacco Use	o	o	o	o
d.	Alcohol & Drug Use	o	o	o	o
e.	Obesity	o	o	o	o
f.	Sedentary Behaviour	o	o	o	o

3. **Has your school used data from a student health assessment at least once in the past two years to help in planning actions that will improve your school's environment and/or to help determine the impact of changes that you have made on student attitudes and behaviours?**
   a. Yes
   b. No

4. **Has your school made any health policy or practice changes in the past year (e.g., introducing a ban on beverages containing sugar in school vending machines)?**
   a. We have not made any policy changes in the past year
   b. Yes we have made policy changes in the past year

5. **How are your school's *written* health policies (e.g., smoking rules, healthy eating requirements, drug policies) communicated throughout the school community (i.e., staff, parents/families and students)?** *(Check all that apply)*

		Yes	No
a.	Written in a school/board/division/district handbook	o	o
b.	Written in a school/board/division/district newsletter	o	o
c.	Written in a student agenda provided by the school/board/division/district	o	o
d.	Discussed at meetings (e.g., staff meetings, professional development days, assemblies, school council)	o	o
e.	Posted on school/board/division/district website(s)	o	o
f.	Posted at school	o	o
g.	Email distribution	o	o
h.	Written in a school/board/division/district handbook	o	o
i.	Written in a school/board/division/district newsletter	o	o
j.	Written in a student agenda provided by the school/board/division/district	o	o

6. **During the past 12 months, what role did your regional health authority/local public health unit play when working with your school on health promotion and/or activities for students?** *(Circle all that apply)*
   a. No contact with regional health authority/local health unit/department regarding health promotion and/or activities
   b. Provide information/resources/programs (e.g., posters, toolkits)
   c. Solved problems jointly
   d. Developed/implemented program activities jointly

7. **In which fields does your school receive support from your school's local Public Health Unit?** *(Circle all that apply)*
   a. We do not receive any resources from Public Health
   b. Healthy eating
   c. Physical activity
   d. Tobacco use
   e. Alcohol and drug use
   f. Sedentary behaviour
   g. Obesity

8. **During the past 12 months, has your school worked on health promotion and/or activities for students with a ...** *(Circle all that apply)*
   a. Health organization (e.g., Canadian Cancer Society, Heart and Stroke Foundation, Canadian Diabetes Association)
   b. Parks or Recreation department
   c. Youth organization (e.g., YMCA/YWCA, Boys/Girls Clubs, Boy Scouts/Girl Guides)
   d. Health or fitness club
   e. Board/division/district itinerant teacher (e.g., consultant, specialist)

9. **How does your school update policies and practices annually to improve school health?**
   a. We use existing *external* information to inform policy changes (e.g., national health studies)
   b. We use *internal* evidence to inform policy changes (e.g., school survey)
   c. We use a mix of *both* existing external information and internal evidence to inform policy changes
   d. We have not updated our policies in the past year

10. **Since this time last year, what proportion of your school staff has participated in professional development opportunities related to student health topics?**
    a. None
    b. Some
    c. Most
    d. All
    e. Don't know

11. **Please rank these school/health-related issues in terms of importance to your school (1=highest priority, 2=second highest priority, etc.):**

a.	Tobacco Use	_____
b.	Alcohol and other Drug Use	_____
c.	Healthy Eating	_____
d.	Physical Activity	_____
e.	Bullying/Violence	_____
f.	Mental Health	_____
g.	Sexual Health	_____
h.	Sun safety/tanning beds	_____
i.	Obesity	_____
j.	Sedentary behaviours / screen-time	_____
k.	Other :_____	_____

Physical Activity Questions

12. **Is physical inactivity a problem at your school?**
    a. Yes
    b. No
    c. I don't know

13. **Do the majority of students at your school have regular access to indoor physical activity areas *during non-instructional school time?*** *(e.g., during lunch, spare periods)*
    a. Yes on school grounds only
    b. Yes, off school grounds only
    c. Yes, both on and off school grounds
    d. No
    e. I don't know

14. **Do the majority of students at your school have regular access to outdoor physical activity areas *during non-instructional time?*** *(e.g., during lunch, spare periods)*
    a. Yes on school grounds only
    b. Yes, off school grounds only
    c. Yes, both on and off school grounds
    d. No
    e. I don't know

15. Does your school have:

		Yes	*No*	*I don't know*	*N/A*
a.	Gymnasium	○	○	○	○
b.	Indoor facilities (e.g., dance studio, yoga room, fitness room)	○	○	○	○
c.	Outdoor facilities (e.g., playing fields, paved activity areas, baseball diamond)	○	○	○	○

16. Do students have access to various physical activity equipment such as, soccer and basketballs *during non-instructional times* throughout the school day *(e.g., during lunch, or spare periods)?*

a. Always
b. Most of the Time
c. Sometimes
d. Rarely
e. Never

17. Do the majority of students at your school have regular access to any of the following?

			Yes	**No**
a.	Secure change room lockers available for use during physical activity		○	○
b.	Change rooms available for use before and after physical activity		○	○
c.	**If yes**, are privacy curtains/stalls (not including shower or bathroom stalls) available for ...	i. Girls?	○	○
		ii. Boys?	○	○
d.	Clean showers available for use before and after physical activity	i. Girls?	○	○
		ii. Boys?	○	○

18. *Outside of school hours*, does your school permit regular student access to the following?*
"Outside of school hours means before and/or after school, evenings and weekends. Student access may occur via school-led, community-led or informal use."

		Yes	*No*	*I don't know*	*N/A*
a.	Gymnasium	○	○	○	○
b.	Indoor facilities (e.g., dance studio, yoga room, fitness room)	○	○	○	○
c.	Outdoor facilities (e.g., playing fields, paved activity areas, baseball diamond)	○	○	○	○
d.	Equipment (e.g., soccer balls, basketballs)	○	○	○	○

19. Does your school offer *intramural programs/club activities* that involve physical activity? *(Intramural programs/club activities are school-sponsored physical/recreational activities that occur outside of instructional time, are available to all students, are focused on maximizing participation and are limited to individuals/groups/teams of the school population.)*

a. Yes
b. No

20. During the past 12 months, how many intramural *programs* that involve physical activity were available to students over the course of the school year?

a. Grades 9-10
- o Fall_____
- o Winter_____
- o Spring_____

b. Grades 11-12
- o Fall_____
- o Winter_____
- o Spring_____

21. Does your school offer *non-competitive sports clubs (e.g. rock climbing, dance, outdoor club)* that involve physical activity?

a. Yes
b. No

22. Does your school offer *interschool or varsity programs* that involve physical activity? *Interschool programs are board/division/district/school-sponsored competitive athletic programs that occur outside of instructional time, are available to select individuals/groups and are competitive against other schools.*

a. Yes
b. No

23. How many hours of Physical Education are mandatory for each grade at your school in a school year?

a. Grade 9 _____
b. Grade 10 _____
c. Grade 11 _____
d. Grade 12 _____

24. To the best of your knowledge, how well do each of the following statements characterize your school?

	A lot	Some	Very Little	Not at all	I don't know
a. We administer physical activity, such as laps or push-ups, as a disciplinary measure	o	o	o	o	o
b. We use physical activity as a reward	o	o	o	o	o
c. We promote physical activity during or as part of special events (e.g., Terry Fox Run)	o	o	o	o	o
d. We integrate physical activity into other curriculum areas	o	o	o	o	o

25. Does your school have programs in place to help students understand fitness?

a. No
b. Yes → **If yes, do they teach how** to increase their fitness levels and decrease their sedentary behaviour?
- o Yes
- o no

26. Did the development of your physical activity policies/programs include input from parents or the community?

a. We **have not** developed physical activity policies or programs
b. We have policies and/or programs but **no**, they were not developed with outside help
c. **Yes**, we collaborated with...(select all that apply)
- o Parents
- o Community leaders/groups

27. Does your school require training for education, coaching, recreation, healthcare, and other school and community personnel that imparts the knowledge and skills needed to effectively promote enjoyable, lifelong physical activity among young people?

a. No
b. Yes→
   - Required for school staff only
   - Required for community members only
   - Required for both school staff and community members

Healthy Eating Questions

28. Is unhealthy eating a problem at your school?

a. Yes
b. No
c. I don't know

29. Who operates the ...*(Check all that apply)*

		School	School council (i.e. parent council)	Food service company	Non-profit organization	Students	Other	N/A
a.	Cafeteria?	o	o	o	o	o	o	o
b.	Snack bar/Tuck shop?	o	o	o	o	o	o	o
c.	Vending Machines?	o	o	o	o	o	o	o

30. Does your school have a school nutrition program for breakfast (breakfast program): If so, who is responsible for its operation?

a. Yes, it is operated by _____
b. No, if no, skip to question 34

31. How many times is the breakfast program offered per week?

a. 1 day per week
b. 2 days per week
c. 3 days per week
d. 4 days per week
e. 5 days per week

32. Is the breakfast program available to all students regardless of their ability to pay?

a. Yes
b. No

33. To the best of your knowledge, on an average day, what percentage of students in your school participate in the breakfast program?

a. _____%

34. To the best of your knowledge, how well do each of the following statements characterize healthy eating education at your school?

	A lot	Some	Very little	Not at all	I don't know
a. Teachers use Canada's Food Guide materials to support the healthy eating curriculum	○	○	○	○	○
b. Healthy eating education is integrated into other curriculum areas (e.g., food labels addressed in science or math class)	○	○	○	○	○

35. Does your school offer any of the following? *(Check all that apply)*

	Yes	No
a. Cooking classes	○	○
b. Gardening (e.g., growing produce)	○	○
c. Field trips to farms/farmers' markets	○	○
d. Media literacy on special topics related to healthy eating (e.g., body image, eating disorders)	○	○
e. Field trips to the local grocery store	○	○

36. Does your school have any of the following written policies or practices that support healthy eating?

	Yes, through written policy	Yes, through practices	No	N/A
a. Healthy food offered in cafeteria(s)	○	○	○	○
b. Healthy food offered in snack/tuck shop(s)	○	○	○	○
c. Healthy food offered in vending machine(s)	○	○	○	○
d. Healthy food offered in a lunch program	○	○	○	○
e. Healthy food choices at reasonable/subsidized prices	○	○	○	○
f. Hours that food services are accessible meet student needs for healthy eating	○	○	○	○
g. Healthy food offered during special events, field trips and classroom celebrations	○	○	○	○
h. Healthy beverages (e.g., water) allowed in the classroom during instructional time	○	○	○	○
i. Avoid use of 'junk food' (e.g., sugary treats) as a reward	○	○	○	○
j. Ban 'junk food' advertising at school	○	○	○	○
k. Food sold as fundraising activity is healthy	○	○	○	○

37. To the best of your knowledge, to what extent do students at your school experience the following issues?

		A lot	Some	Very little	Not at all	I don't know
a.	Overweight or obesity	o	o	o	o	o
b.	Dieting or eating disorders	o	o	o	o	o
c.	Family financial concerns	o	o	o	o	o
d.	Skipping breakfast	o	o	o	o	o
e.	Lack of time for lunch	o	o	o	o	o
f.	Inadequate space for lunch	o	o	o	o	o
g.	Lack of healthy food and/or beverage choices available at your school	o	o	o	o	o
i.	Lack of healthy eating education for students	o	o	o	o	o
j.	Close proximity of local fast food outlets	o	o	o	o	o

38. Does your school have programs in place to help students understand nutrition?

a. No
b. Yes → If yes: *(Check all that apply)*
   - How to <u>increase</u> their consumption of fruits and vegetables?
   - How to <u>increase</u> their consumption of water?
   - How to <u>decrease</u> their consumption of fats, sugars, junk food, and sugary beverages?

39. During the past 12 months, have school staff who are involved with healthy eating received ...

		Yes, all staff	Yes, some staff	No	I don't know
a.	In-service training (on nutrition) by Registered Dieticians (e.g., public/regional health)?	o	o	o	o
b.	In-service training related to teaching the healthy eating curriculum?	o	o	o	o
c.	Sensitivity training to promote positive self-body image?	o	o	o	o

40. Do school staff have clear guidelines to refer students with suspected eating disorders to the appropriate health professional or community agency?

a. Yes
b. No
c. I don't know

41. Did the development of your healthy eating policies/programs include input from parents or the community?

a. We **have not** developed healthy eating policies or programs
b. We have policies and/or programs but **no**, they were not developed with outside help
c. **Yes**, we collaborated with...(select all that apply)
   - Parents
   - Community leaders/groups

Tobacco Questions:

42. Is tobacco use a problem at your school?

a. Yes
b. No
c. I don't know

43. Does your school prohibit smoking tobacco (e.g. cigarettes, cigars, cigarillos) in each of the following locations for each of the following groups? *(Check all that apply)*

	Students	Teachers/ staff	Parents/ Guardians	Other Visitors
a. School buildings during school hours	o	o	o	o
b. School buildings *outside* of school hours	o	o	o	o
c. School **grounds** during school hours	o	o	o	o
d. School **grounds** *outside* of school hours	o	o	o	o
e. Within a specified distance of school grounds	o	o	o	o
f. School buses or other vehicles used to transport students	o	o	o	o
g. Private vehicles parked on school grounds	o	o	o	o
h. Sponsored events *off* of school grounds	o	o	o	o

44. Does your school prohibit student use of smokeless tobacco (e.g. chewing tobacco, pinch, snuff, or snus)

		Yes	No
a.	On school property during school hours	o	o
b.	On school property outside school hours	o	o
c.	During school activities off school property (e.g. field trips, school sport tournaments)	o	o

45. Does your school prohibit the possession of any of the following types of of tobacco for students on school property? *(Check all that apply)*

	Yes	No
a. Cigarettes	o	o
b. Cigars	o	o
c. Cigarillos (little cigars)	o	o
d. Smokeless tobacco (e.g., chewing tobacco, pinch, snuff, or snus)	o	o

46. Does your school have a designated spot on school grounds where students are allowed to smoke?

a. Yes
b. No
c. No, but there is an area off of school grounds within view of the school

47. With whom does your school collaborate to develop *written policies and practices* on tobacco use? *(Circle all that apply)*

a. Students
b. Teachers/Staff
c. Parents/Guardians
d. School board/division/district officials
e. Regional health authority/ public health unit
f. Community representatives (e.g., Canadian Cancer Society, The Lung Association, Heart and Stroke Foundation , etc.)
g. This school does not have a collaboration process in place
h. N/A or this school does not have written policies or practices

48. What are the consequences for students who are caught violating your school's *written policies or practices* on tobacco use?

		Yes	No	I don't know
a.	Issue warning (written or verbal)	o	o	o
b.	Inform parents or guardians	o	o	o
c.	Refer to a school administrator	o	o	o
d.	Refer to a school counsellor	o	o	o
e.	*Encourage*, but not require, to participate in an assistance, education, or quit smoking program	o	o	o
f.	*Require* to participate in an assistance, education or quit smoking program	o	o	o
g.	Confiscate tobacco	o	o	o
h.	Assign additional class work (written/presentation)	o	o	o
i.	Assign to help around school	o	o	o
j.	Fine	o	o	o
k.	Place in detention	o	o	o
l.	Give in-school suspension	o	o	o
m.	Suspend from school	o	o	o

49. Do sanctions get stronger with subsequent violations (progressive discipline approach)?

a. Always
b. Most of the time
c. Sometimes
d. Rarely
e. Never
f. I do not know: We have never had a violation

50. Does your school have guidelines on how teachers and other school staff should enforce your school's *written policies* on tobacco use (e.g., procedure taken when a student is caught smoking)?

a. Yes
b. No
c. I don't know

51. How consistently are your school's *written policies* on tobacco use (e.g., smoking on school property) ADHERED to by students?

a. Always
b. Most of the time
c. Sometimes
d. Rarely
e. Never
f. I do not know
g. No students at this school smoke
h. We do not have written policies on tobacco use

52. Does your school provide tobacco-use prevention education?

a. Yes
b. No
c. I don't know

53. Are tobacco cessation programs offered at your school?

a. Yes
b. No
c. I don't know

54. Does your school have programs in place to help students understand...

a. short- and long-term negative physiologic and social consequences of tobacco use?
b. social influences on tobacco use?
c. peer norms regarding tobacco use?
d. refusal skills?

55. Did the development of your tobacco-use policies/programs include input from parents, the community, government agencies, or health organizations (e.g., CCS, Heart & Stroke Foundation)? If so, who?

a. We **have not** developed tobacco policies or programs
b. We have tobacco policies and/or programs but **no**, they were not developed with outside help
c. **Yes**, we collaborated with...(select all that apply)
   - Parents
   - Community leaders/groups
   - Government agencies_____
   - Health Organizations _____

Drug and Alcohol Questions:

56. Is alcohol use a problem at your school?

a. Yes
b. No
c. I don't know

57. With whom does your school collaborate to develop *written policies* on alcohol? *(Circle all that apply)*

a. Students
b. Teachers/Staff
c. Parents/Guardians
d. School board/division/district officials
e. Regional health authority/ public health unit
f. Community representatives (e.g., Heart and Stroke Foundation, Canadian Cancer Society, etc.)
g. This school does not have a collaboration process in place
h. This school does not have written policies on alcohol

58. What are the consequences for students who are caught violating your school's *written policies* on alcohol?

		Yes	No	I don't know
a.	Issue warning (written or verbal)	o	o	o
b.	Inform parents or guardians	o	o	o
c.	Refer to a school administrator	o	o	o
d.	Refer to a school counsellor	o	o	o
e.	Encourage, but not require, to participate in an assistance, education, or cessation program	o	o	o
f.	Require to participate in an assistance, education or cessation program	o	o	o
g.	Confiscate alcohol and	o	o	o
h.	Assign additional class work (written/presentation)	o	o	o
i.	Assign to help around school	o	o	o
j.	Fine	o	o	o
k.	Place in detention	o	o	o
l.	Give in-school suspension	o	o	o
m.	Suspend from school	o	o	o
n.	Alert police	o	o	o

59. Do sanctions get stronger with subsequent violations (progressive discipline approach)?

a. Always
b. Most of the time
c. Sometimes
d. Rarely
e. Never
f. Don't know
g. We have never had a violation

60. Does your school have guidelines on how teachers and other school staff should enforce your school's *written policies* on alcohol use (e.g., procedure taken when a student is caught using alcohol or is found to be under the influence thereof)?

a. Yes
b. No
c. I don't know

61. How consistently are your school's *written policies* on alcohol use ADHERED to by students?

a. Always
b. Most of the time
c. Sometimes
d. Rarely
e. Never
f. I do not know
g. No students at this school use alcohol
h. We do not have written policies on alcohol

62. Does your school provide alcohol use prevention education?

a. Yes
b. No
c. I don't know

- **If Yes**, how many of the following aspects of prevention are covered?
  - short- and long-term negative physiologic and social consequences of alcohol
  - study habits and academic support;
  - communication;
  - peer relationships;
  - self-efficacy and assertiveness;
  - alcohol resistance skills managing anxiety
  - reinforcement of anti-alcohol attitudes; and
  - strengthening of personal commitments against alcohol abuse

63. Did the development of your alcohol policies/programs include input from parents or the community?

a. We have not developed alcohol policies or programs
b. We have policies and/or programs but no, they were not developed with outside help
c. Yes, we collaborated with...(select all that apply)
   - Parents
   - Community leaders/groups

64. Are students at your school allowed to carry or wear apparel or paraphernalia with alcohol company names or logos on it?

a. No
b. Yes
c. I don't know
d. Not applicable

65. Which of the following methods have been used to provide teachers with alcohol prevention and/or cessation education during the last school year? *(Circle all that apply)*

a. Local board in-service training
b. Conferences
c. Presentations at staff meetings
d. Workshops on professional development days
e. Presentations by Community Organizations
f. Teacher initiated self-training on the Internet at home
g. Teacher initiated self-training on the Internet at school
h. Faculty of Education courses
i. Other: Please Specify _____

66. How does your school's alcohol prevention education fit into the curriculum? *(Check all that apply)*

a. Alcohol prevention is part of a greater education component the school health program.
b. Alcohol prevention is taught on its own.
c. Alcohol prevention is taught within the context of other subject areas. (e.g., within Family Studies, Biology, or Religion/Values, if applicable)
d. Alcohol prevention activities are encompassed within the extra-curricular activities (outside of class) offered at our school.
e. Other: Please specify _____
f. I don't know

67. To what extent are the following topics covered in your school's alcohol prevention lessons or elsewhere in your school's curriculum?

		Not at all	A little	Some	A lot
a.	Short term health consequences of alcohol use (e.g., decreased stamina, increased possibility of accidents/injuries, etc.)	o	o	o	o
b.	Long-term health consequences of alcohol use (e.g., heart disease, cancer, liver-failure, premature aging, and premature death).	o	o	o	o
c.	Addictive effects of alcohol	o	o	o	o
d.	Social consequences of using alcohol	o	o	o	o
e.	The influences to use alcohol (e.g., peers, family, culture, etc.)	o	o	o	o
f.	How students can influence or support others to prevent or quit alcohol	o	o	o	o
g.	Decision-making/communication skills to avoid/resist alcohol	o	o	o	o

68. How often are the following instructional strategies used during alcohol prevention exercises at your school?

		Not at all	A little	Some	A lot
a.	Classroom discussions	o	o	o	o
b.	Seat Work	o	o	o	o
c.	Small group activities	o	o	o	o
d.	Lectures	o	o	o	o
e.	Student workshops	o	o	o	o
f.	Role-playing, simulations, or practice	o	o	o	o
g.	Rehearsal/modelling of resistance behaviours	o	o	o	o
h.	Adult guest speakers	o	o	o	o
i.	Peer educators/student guest speakers	o	o	o	o
j.	The internet	o	o	o	o
k.	Special projects (e.g., posters, contests, etc.)	o	o	o	o
l.	Videos	o	o	o	o

69. Is drug use a problem at your school?

a. Yes
b. No
c. I don't know

70. With whom does your school collaborate to develop *written policies* on drug? *(Circle all that apply)*

a. Students
b. Teachers/Staff
c. Parents/Guardians
d. School board/division/district officials
e. Regional health authority/ public health unit
f. Community representatives (e.g., Heart and Stroke Foundation, Canadian Cancer Society, etc.)
g. This school does not have a collaboration process in place
h. This school does not have written policies on drug

71. What are the consequences for students who are caught violating your school's *written policies* on drugs?

		Yes	No	I don't know
a.	Issue warning (written or verbal)	o	o	o
b.	Inform parents or guardians	o	o	o
c.	Refer to a school administrator	o	o	o
d.	Refer to a school counsellor	o	o	o
e.	Encourage, but not require, to participate in an assistance, education, or cessation program	o	o	o
f.	Require to participate in an assistance, education or cessation program	o	o	o
g.	Confiscate drugs	o	o	o
h.	Assign additional class work (written/presentation)	o	o	o
i.	Assign to help around school	o	o	o
j.	Fine	o	o	o
k.	Place in detention	o	o	o
l.	Give in-school suspension	o	o	o
m.	Suspend from school	o	o	o
n.	Alert police	o	o	o

72. Do sanctions get stronger with subsequent violations (progressive discipline approach)?

a. Always
b. Most of the time
c. Sometimes
d. Rarely
e. Never
f. Don't know
g. We have never had a violation

73. Does your school have guidelines on how teachers and other school staff should enforce your school's *written policies* on drug use (e.g., procedure taken when a student is caught using drugs or is found to be under the influence thereof)?

a. Yes
b. No
c. I don't know

74. How consistently are your school's written *policies* on drugs use ADHERED to by students?

a. Always
b. Most of the time
c. Sometimes
d. Rarely
e. Never
f. I do not know
g. No students at this school use drugs
h. We do not have written policies on drugs

75. Does your school provide drug use prevention education?

a. Yes
b. No
c. I don't know

- **If Yes**, how many of the following aspects of prevention are covered?
  - short- and long-term negative physiologic and social consequences of drug use
  - study habits and academic support;
  - communication;
  - peer relationships;
  - self-efficacy and assertiveness;
  - drug resistance skills managing anxiety
  - reinforcement of antidrug attitudes; and
  - strengthening of personal commitments against drug abuse

76. Did the development of your drug use policies/programs include input from parents or the community?

a. We have not developed drug use policies or programs
b. We have policies and/or programs but no, they were not developed with outside help
c. Yes, we collaborated with...(select all that apply)
   - Parents
   - Community leaders/groups

77. Are students at your school allowed to carry or wear apparel or paraphernalia with marijuana or other drug imagery on it?

a. No
b. Yes
c. I don't know
d. Not applicable

78. Which of the following methods have been used to provide teachers with drug use prevention and/or cessation education during the last school year? *(Circle all that apply)*

a. Local board in-service training
b. Conferences
c. Presentations at staff meetings
d. Workshops on professional development days
e. Presentations by Community Organizations
f. Teacher initiated self-training on the internet at home
g. Teacher initiated self-training on the internet at school
h. Faculty of Education courses
i. Other: Please Specify _____

79. How does your school's drug use prevention education fit into the curriculum? *(Check all that apply)*

a. Drug use prevention is part of a greater education component the school health program.
b. Drug use prevention is taught on its own.
c. Drug use prevention is taught within the context of other subject areas. (e.g., within Family Studies, Biology, or Religion/Values, if applicable)
d. Drug use prevention activities are encompassed within the extra-curricular activities (outside of class) offered at our school.
e. Other: Please specify _____
f. I don't know

80. To what extent are the following topics covered in your school's drug use prevention lessons or elsewhere in your school's curriculum?

		Not at all	A little	Some	A lot
a.	Short term health consequences of drug use (e.g., decreased stamina, increased possibility of accidents/injuries, etc.)	o	o	o	o
b.	Long-term health consequences of drug use (e.g., heart disease, cancer, liver-failure, premature aging, and premature death).	o	o	o	o
c.	Addictive effects of drugs	o	o	o	o
d.	Social consequences of using drugs	o	o	o	o
e.	The influences to use drugs (e.g., peers, family, culture, etc.)	o	o	o	o
f.	How students can influence or support others to prevent or quit drugs	o	o	o	o
g.	Decision-making/communication skills to avoid/resist drugs	o	o	o	o

81. How often are the following instructional strategies used during drug use prevention exercises at your school?

		Not at all	A little	Some	A lot
a.	Classroom discussions	o	o	o	o
b.	Seat Work	o	o	o	o
c.	Small group activities	o	o	o	o
d.	Lectures	o	o	o	o
e.	Student workshops	o	o	o	o
f.	Role-playing, simulations, or practice	o	o	o	o
g.	Rehearsal/modelling of resistance behaviours	o	o	o	o
h.	Adult guest speakers	o	o	o	o
i.	Peer educators/student guest speakers	o	o	o	o
j.	The internet	o	o	o	o
k.	Special projects (e.g., posters, contests, etc.)	o	o	o	o
l.	Videos	o	o	o	o

Appendix C: Additional Results

Table 6 Single independent variable GEE models examining student factors associated with bullying among grade 9 to 12 students in COMPASS, Year 1, 2012-2013

Parameters		**Model 1 Physical Bullying**	**Model 2 Verbal Bullying**	**Model 3 Cyberbullying**
		Odds Ratio (95%CIs)	Odds Ratio (95%CIs)	Odds Ratio (95%CIs)
Grade	9 (N=6270)	1.64 (1.30-2.09)	1.32 (1.19-1.46)	1.27 (1.08-1.51)
	10 (N=6144)	1.60 (1.26-2.04)	1.29 (1.17-1.43)	1.29 (1.09-1.52)
	11 (N=5866)	1.40 (1.09-1.80)	1.22 (1.09-1.35)	1.24 (1.04-1.47)
	12 (N=5641)	1.00	1.00	1.00
Gender	Female (N=11869)	0.43 (0.36-0.50)	1.67 (1.56-1.80)	2.99 (2.63-3.41)
	Male (N=12052)	1.00	1.00	1.00
Ethnicity	White (N=17015)	1.00	1.00	1.00
	Other (N=6807)	1.75 (1.48-2.07)	0.83 (0.77-0.91)	0.96 (0.84-1.10)
Disposable Income	$0 (N=3746)	1.00	1.00	1.00
	$1 - $20 (N=7274)	0.92 (0.73-1.16)	1.04 (0.93-1.16)	1.13 (0.94-1.36)
	$21 - $100 (N=6436)	0.76 (0.60-0.97)	0.92 (0.82-1.02)	1.17 (0.97-1.41)
	$100+ (N=3371)	0.98 (0.75-1.29)	0.88 (0.77-1.00)	1.29 (1.05-1.59)
	Do not know (N=2938)	0.70 (0.51-0.96)	0.82 (0.72-0.94)	0.82 (0.65-1.05)
Tobacco Use	Current (N=1380)	3.88 (3.15-4.78)	1.43 (1.25-1.63)	2.63 (2.21-3.14)
	Not current (N=22541)	1.00	1.00	1.00
Alcohol Use	Current user (N=8379)	1.57 (1.33-1.84)	1.27 (1.18-1.37)	1.98 (1.76-2.23)
	Not current (N=14885)	1.00	1.00	1.00
	Missing (N=657)	1.31 (0.82-2.09)	0.69 (0.53-0.89)	0.93 (0.61-1.42)
Marijuana Use	Current user (N=4049)	2.76 (2.34-3.27)	1.33 (1.22-1.46)	2.28 (2.01-2.58)
	Not current (N=19340)	1.00	1.00	1.00
	Missing (N=532)	0.90 (0.48-1.69)	0.26 (0.17-0.40)	0.44 (0.23-0.83)
Academic Achievement	High (N=12646)	1.00	1.00	1.00
	Moderate (N=8915)	1.29 (1.08-1.54)	1.03 (0.95-1.11)	1.17 (1.03-1.33)
	Low (N=1417)	3.85 (3.04-4.85)	1.35 (1.17-1.56)	2.38 (1.96-2.89)
	Missing (N=943)	0.85 (0.52-1.40)	0.66 (0.54-0.82)	0.59 (0.39-0.88)
BMI (Body Mass Index)	Underweight (N=340)	3.50 (2.27-5.39)	1.30 (0.99-1.72)	1.89 (1.28-2.80)
	Normal (N=13613)	1.00	1.00	1.00
	Over/Obese (N=4792)	1.33 (1.08-1.62)	1.15 (1.06-1.26)	1.08 (0.93-1.25)
	Missing (N=5176)	1.59 (1.31-1.92)	0.95 (0.87-1.04)	1.16 (1.01-1.34)

Model 1 – Physically bullied (1) = n = 645, physically bullied (0) = n = 23276
Model 2 – Verbally bullied (1) = n = 3722, verbally bullied (0) = n = 20199
Model 3 – Cyberbullied (1) = n = 1238, cyberbullied (0) = n = 22683
Class statement was included to control for clustering by school