How do school disciplinary approaches and student perceptions of school support relate to youth cannabis use? A cross-sectional analysis of Year 7 (2017-2018) of the COMPASS study

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ABSTRACT

Background: In the school year immediately following cannabis legalization in Canada, the objectives of this thesis were: (1) to examine the disciplinary approaches being used in secondary schools for students who violate school substance use policies, and associations with cannabis use among youth; and (2) to investigate youth perceptions of school support for the prevention and cessation of substance use, if perceptions vary by school disciplinary approaches, and whether they are associated student cannabis use.

Methods: School- and student-level survey data from Year 7 (2018/2019) of the COMPASS study were used, including 74,501 grade 9-12 students attending 136 secondary schools. A framework for classifying schools into disciplinary approach styles was established based on school-reported response measures used for student first-offence violations of the school cannabis policies. Multilevel logistic regression models examined associations between school disciplinary approach styles, student perceptions of school support for the prevention/cessation of student substance use, and student cannabis use.

Results: Despite all schools reporting always/sometimes using a progressive discipline approach, punitive consequences (suspension, alert police) remain prevalent as first-offence options, with fewer schools indicating supportive responses (counselling; cessation/educational programs). Most schools were classified as using Authoritarian and Authoritative approaches, followed by Neglectful and Permissive/Supportive styles. No disciplinary approach styles were associated with cannabis use. Students attending schools classified as Permissive/Supportive (high supportive; low punitive) had a higher likelihood of perceiving their school as supportive

for substance use prevention/cessation than their peers at Authoritarian (high punitive; low supportive) schools. Students who perceived their school as "supportive" were less likely to report current cannabis use than their peers who perceived their school as unsupportive.

Conclusions: This study is the first to classify school discipline approach styles using school-level measures. Unlike previous studies using classifications based on student perceptions, results do not support direct associations between school disciplinary styles and student cannabis use. Greater use of supportive approaches (e.g., counselling referrals, educational programs) over punitive consequences may promote student perceptions of school supportiveness for the cessation/prevention of substance use. Further research is needed to explore additional factors promoting student perceptions of school supportiveness, given associations with cannabis use.

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LIST OF ABBREVIATIONS

COMPASS	Cannabis, Obesity, Mental health, Physical activity, Alcohol, Smoking, Sedentary behaviour
Cq	COMPASS Student Questionnaire
SPP	School Policies and Practices Question
ASC	Authoritarian School Climate theory
ICC	Intraclass Coefficient
SD	Standard Deviation
OR	Odds Ratio
CI	Confidence Interval

Chapter 1

1.1 INTRODUCTION

On October 17th, 2018, Canada implemented Bill C-45 to legalize and regulate recreational cannabis consumption among adults (1). One of the main intentions of Bill C-45 is to reduce youth access and deter early-onset of use (2). According to the Canadian Student Tobacco, Alcohol and Drugs Survey in 2016/2017, 17% of youth in grades 7-12 reported past 12-month cannabis use, with grade 12 students having the highest reported usage at 34.5% (1). Canadian youth have been identified as having some of the highest rates of past-year use when compared to other countries (2). With the recent legalization of cannabis, preventing and/or delaying onset of cannabis use in youth has become a strategic priority.

Schools are key contexts for equitable prevention strategies as the location where almost all youth, regardless of socioeconomic status (SES), spend approximately 25 hours a week during the school year. School-based approaches have the potential to prevent cannabis use among students, which may, in turn, protect their educational attainment, and cognitive, mental, and physical health (3) (4). Cannabis use in youth is associated with an increased likelihood of disengagement from school, drop out, and lower achievement levels (4). Conversely, studies have shown that achievement in academia and engagement in school provide protective measures against substance use (5). Furthermore, school-wide social norms and school climate are associated with student substance use (6). Some evidence suggests that students who attend schools with a positive climate feel supported and encouraged, are more engaged in academics and school activities, and are less inclined to engage in high-risk behaviours (7). That is, a supportive school environment may act as a protective mechanism for youth against a multitude of problem behaviours, including substance use (8).

School climate may be influenced by school policies and disciplinary approaches. Policies have the potential to restrict student substance use during school hours and on school property; however, limited research has examined how schools respond when students violate these policies. Most schools have consequence measures for the use of drugs on school property or during school hours, although differences in school-to-school disciplinary approaches exist. There has been a general movement in US and Canadian schools away from more traditional "authoritarian" punitive disciplinary approaches to more supportive "authoritative" strategies, and similarly from "zero-tolerance" to progressive disciplinary approaches, where sanctions get stronger with each violation (9). Authoritarian disciplinary actions would be considered more harsh punishments, such as expulsion, fines, or suspensions. In contrast, authoritative disciplinary actions may include counselling for the student, assigning additional work, or encouraging the student to participate in a cessation program. Punitive approaches have traditionally been used to scare students into compliance, but research suggests this can further alienate students that need help, potentially increasing their likelihood of substance use, drop out, and delinquent behaviour (10) (11). Stemming from Baumrind's (1968) work on parenting types (12), authoritarian approaches are described as demanding and with no expectation of explanations for actions, whereas authoritative discipline in schools uses structure and support to respect student autonomy (13). Likewise, in Ontario, the Ministry of Education mandated all schools in 2009 to implement a Progressive Discipline Policy, designed to promote more positive actions by shifting from a punitive approach to one that helps students learn from their choices and reflect on the impact (14). Based on this policy, schools should consider a range of supports (e.g. counselling) and consequences (e.g., assign additional classwork, detention) that provide learning opportunities to help increase positive decision making (12).

Despite these developments, little is known about what disciplinary approaches schools have implemented, and how they relate to student risk behaviours, such as substance use. Moreover, there is limited knowledge regarding student perceptions of school environments, in terms of whether they find them to be supportive in abstaining or reducing substance use, if perceptions vary by the disciplinary approaches implemented, and if these perceptions predict their substance use. Studying student perceptions would offer a new approach to improve the school context for the prevention of youth substance use. Using data from the most recent wave (year 7 [2018/2019]) of the COMPASS study (COMPASS), the purpose of this thesis is to examine the disciplinary approaches being used in secondary schools for students who violate school cannabis use policies and associations with cannabis use among youth. Furthermore, it looks to evaluate student perceptions of school support for the prevention and cessation of substance use, whether perceptions vary by school disciplinary approaches, and how perceptions relate to student cannabis use. The primary research questions are as follows:

RQ1.) What disciplinary approaches associated with violating school substance use policies are available in schools specific to cannabis?

RQ2.) Are school cannabis use policy violation disciplinary approaches associated with student cannabis use?

RQ3.) Are school disciplinary approaches associated with student perceptions of school support for the cessation and prevention of substance use?

RQ4.) Do student perceptions of school support (for the prevention and cessation of substance use) mediate the association between school disciplinary approaches and student cannabis use?

1.2 LITERATURE REVIEW

There is currently a gap in the literature regarding effective school-based disciplinary approaches and cannabis use (15). The purpose of this thesis is to examine the disciplinary approaches being used in secondary schools for students who violate school substance use policies, and associations with cannabis use among youth. Furthermore, it seeks to investigate youth perceptions of school support for the prevention and cessation of substance use, if perceptions vary by school disciplinary approaches, and whether they are associated with student cannabis use. This literature review aims to explain the importance of examining cannabis use in youth and provides an overview of existing evidence on school disciplinary approaches and how the school context relates to student substance use.

1.2.1 Youth Cannabis Use:

Youth in Canada use cannabis at the highest rates globally (16). Following a steady decline in youth cannabis use over several years, a gradual increase occurred since the beginning of federal discourse around legalization, particularly in occasional or 'sensible' use, described as socially acceptable and intermittent use(17). Increased use among females, whose use has traditionally been more stigmatized than in males (17), may be due in part to more accessible alternative cannabis products (17) (18). In 2017/2018, alternative modes of cannabis use increased (23). Approximately 20% of students who reported current cannabis use also reported using all three modes of consumption (i.e., smoking, vaping, eating/drinking) (23). However, the dominant method of cannabis use remains smoking (23). Male students are more likely to escalate their usage with increasing grade, engage in poly-substance use, and start using at a younger age, suggesting poorer health outcomes than females (16) (17) (20). On average, youth

initiate use of cannabis around 15 years of age (21). Furthermore, an increase in use is seen with increase in grade levels (22). Consistently across the literature, cannabis use among Indigenous students remains high, compared to other minority groups (17) (19).

Furthermore, cessation of cannabis use in youth has been associated with being less likely to use of other substances, being academically rigorous, and engaging in physical activity (16).

Cannabis use in youth can have significant implications to their physical and mental health, in both the short and long term (23). The dominant perception of cannabis among Canadian youth is that it is harmless (5), yet adolescents are more vulnerable to the detrimental effects from substance use, as the brain continues to develop up until about age twenty-five (6). It is critical to delay the onset of use to reduce the potential harmful effects of cannabis use. Some research suggests early-onset, heavy and frequent cannabis use can adversely impact neurodevelopment. Specifically, youth engaging in cannabis use have shown evidence of long-term decreased hippocampal response rates, difficulties with problem solving, decreased cortical gray matter, and increased white matter (24)**.** Introduction of exogenous cannabinoids could disrupt normal brain development in youth (25). Anxiety, issues with processing information in the brain, and difficulty focusing are just some of the potential effects that early-onset cannabis use is suggested to have on cognitive and mental health (10). Such effects may transfer over to youth's ability to perform academically (26). Cannabis use is linked to high school drop-out and neglecting further (i.e., post-secondary) education, especially among those who initiate use before 15 years of age (10). Additionally, there are links between cannabis use and time spent studying, attitudes towards school, homework completion, and participation in class (5) (16). Students that do not engage in cannabis use are more likely to complete their homework and remain academically involved (16), suggesting that academic engagement may also act as a

protective factor. Delaying youth onset is an important goal to reduce the risk of negative impacts on youth development.

On the other hand, further research is needed to address the changing landscape in cannabis usage. Some research suggests that cannabis may have neuroprotective properties that can help manage mental health issues (e.g., anxiety, depression, sleep disorders) (27) (28). There is also evidence to support cannabis use for symptom management in individuals suffering from chronic pain, tremors, and nausea (29). The lack of consensus regarding the harms and therapeutic potential of cannabis use may contribute to youth perceptions surrounding cannabis use (23) (28).

It is essential to understand the reasons for substance use, as well as investigate protective factors, in order to inform prevention strategies that discourage early-onset and problematic use among youth (30). Adolescence, defined as ages 15 through 19, is a critical time to intervene, as a key developmental stage of life when health-related habits develop and often continue into adulthood (18). Youth are at a higher risk of substance use (18), due, in part, to their increased susceptibility to peer pressure, rebellion, and experimentation (18). Other reasons for cannabis use in youth include access/availability and willingness/readiness to use cannabis (4). Studies indicate that when given the opportunity, youth are more likely to use cannabis than to decline (4). Youth typically believe cannabis is less harmful than other substances (23). Reasons behind this belief include: the availability and acceptability of cannabis, and the perceptions of positive effects on managing pain and stress (23). Furthermore, many youth believe that cannabis is not addictive, and therefore, they will not experience withdrawal symptoms (23). There is also a lack of awareness of the laws around cannabis, with some youth believing that they could not be charged for having under a certain amount of cannabis on them (30).

With the recent legalization, it is important to properly educate youth on cannabis. While cannabis has been legalized federally, differences exist across Canadian jurisdictions. Bill C-45 set a nationally regulated provision on cannabis production, distribution, retail, possession and consumption (31) (33). However, the provinces and territories were tasked with developing additional legislation and policy for cannabis legalization, such as home cultivation, distribution, retail, and consumption (33). Even though cannabis use is only legalized among adults (18 or 19 years and over, depending on the province or territory), youth may be indirectly affected through de-stigmatization of use (4) and potential changes in accessibility.

1.2.2 The School Context:

Schools offer a unique platform where behaviour can be reinforced and targeted, reaching many youth simultaneously (34). More than just knowledge exchange environments, schools are also social environments for students. School climate and social influence can have important implications in reducing substance use in youth (29) (30). At a minimum, school policies aim to regulate the frequency and location of substance use behaviours within and around the school (24). Most schools have consequence measures for the use of drugs on school property or during school hours, although differences in school-to-school disciplinary approaches exist.

School policies set expectations for student behaviours and outline procedures to deal with student substance use violations (35). The procedures that follow policy violations are a central component to how policies are implemented (36). Policies in schools aim to reduce the exposure to substances (35); however, it is not clear to what degree school substance use policies are implemented. It is common for a disconnect for written policy, implementation and practice to exist (15). Additionally, schools in Canada can develop their own policies and procedures, as

long as they are in accordance with the *Act and Regulations* and their provincial *Code of Conduct* (37) (38) (39) .

School policies and disciplinary approaches also play a role in setting norms and guidelines for student behaviours (3). Normative beliefs are perceptions individuals hold of other's approval or disapproval of a certain behaviour (31). Students who feel that their social and cultural environment approves of substance use become more prone to use substances themselves (31). Several studies support the concept that school as a social context influences individual cannabis use and that friends, peer groups and other proximal influences play a major role (40) (41) (42). For instance, Kuntsche (2010) found that cannabis use was higher in schools where it was perceived to be more readily available. Studying how the social context in schools' influences cannabis use may help inform more effective strategies to prevent student substance use during school hours and on school property.

Few studies have looked at the longitudinal impact of substance-related policies and disciplinary approaches within secondary schools, as the majority have used cross-sectional designs, investigated government policies, or focused solely on tobacco (3). Drawing from previous COMPASS research, changes to policy enforcement on tobacco use in secondary schools had desirable effects on the prevalence of student smoking (43), shortly after the Government of Ontario implemented the Smoke-Free Ontario Strategy. In addition, the progressive discipline approach was associated with further reductions in current smoking among students (43). The researchers concluded that by lessening the opportunity and appeal of smoking, the rates of smoking in youth declined (43). With this knowledge, it is important to examine the effectiveness to which cannabis use disciplinary approaches reduce early-onset student use, especially with new changes in federal (i.e., legalization of cannabis) and

provincial/territorial (e.g., legal age of purchase, where cannabis can be sold and by who) policies.

Baumrind's (1968) work on parenting types identified two parenting dimensions – responsiveness and demandingness (12). "Authoritative" parents were both responsive and demanding, while "authoritarian" parents were low in responsiveness to their children but high in demandingness (12). Children of authoritative parents had preferable scores on behaviours such as independence, achievement, and friendliness. Additionally, Baumrind identified 'permissive' parents, characterized by indulgence. These parents place little demand on their children and avoid confrontive practices (44). Based off this work, the Authoritarian School Climate theory (ASC) was developed which suggests schools that offer a disciplinary structure and student support have better overall outcomes for the students (9). In support, the High School Effectiveness Study (n=7339) assessed student perceptions of school disciplinary approach style. Schools were classified into four categories, 'Authoritative', 'Authoritarian', 'Permissive', and 'Indifferent', based on student responses to measures of school responsiveness and demandingness. This study found that secondary schools classified as using an authoritative approach (i.e. schools that remain engaged and displayed responsive adult concern to students) experienced less truancy and fewer dropouts when compared to authoritarian schools (45). Furthermore, students attending authoritative schools had better behavioural, emotional, and cognitive engagement than their peers at authoritarian schools (45). Schools with high responsiveness levels also had lower substance use (9). Based on results, the authors theorize that in an authoritative school climate, students are more likely to perceive rules as fair and unbiased, and thus, are more likely to comply with rules (9); however, this study did not assess the approaches used by the schools. Consistent with this research, one study found that physical

coercion, a dimension within the authoritarian parenting style, resulted in children with higher rates of cannabis use (46). The authoritarian parenting style was associated with an increased risk for the development of addictive behaviours, which the authors suggest is a result of them trying to regain some control in their lives (46). This finding may have similar results when looking at disciplinary approach styles within secondary schools. How students feel within school may play a role in their behaviour both during and outside of school hours.

Despite government mandated policies and procedures in certain regions, there remains limited evidence on what approaches are actually being used by schools and their effectiveness in deterring student substance use. While most secondary schools have implemented substance-related policies and procedures, differences in enforcement and intentions exist (3). That is, many schools may not comply with federal, provincial, or local municipality policies, and a school's written policy and procedures may not be actualized in practice (24). Moreover, certain policies and protocols may be effective in some schools but not others depending on various contextual factors (26). Further examination of school disciplinary approaches, and student perceptions of these school environments, is necessary to determine what the most effective procedures are to reduce youth cannabis use.

Chapter 2

2.1 INTRODUCTION

Little is known about what approaches secondary schools are using to prevent student cannabis use, especially post legalization in Canada on October 17th, 2018. At a minimum, school polices regarding cannabis prohibit use on and near school grounds (23); however, limited research has examined how schools respond when students violate these policies. Identifying what disciplinary styles are being used across Canada is a necessary first step to provide a baseline in determining how to effectively minimize youth-onset cannabis use and to guide evidence-based decision making in secondary schools moving forward. In order to provide a current picture of the disciplinary environment in secondary schools, this study aimed to examine what approaches secondary schools across different provinces in Canada reported using when students violate school cannabis policies, in the school year immediately post legalization.

Traditionally, it was common for schools to use a "zero tolerance" policy to student misconduct, which aims to send a deterrent message to other students and immediately remove high-risk students. Unfortunately, the effectiveness of zero-tolerance policies has not been empirically tested (13), although some evidence suggests expulsion policies can have unintended negative effects on students (13) (3). Instead, there has been a move toward progressive disciplinary approaches, in which sanctions get progressively stronger with subsequent offences, with the goal of promoting favourable decision making and offering a more supportive environment (33). Stemming from Baumrind's (1968) work on parenting types (12), schools have been described as taking authoritative or authoritarian approaches to discipline. Authoritarian schools are described as taking a "zero-tolerance", highly structured, and controlling disciplinary approach, without attempts to understand the circumstances that

contributed to misconduct. Punitive approaches have traditionally been used to scare students into compliance, but research suggests this can further alienate students that need help, potentially increasing their likelihood of substance use, drop out, and delinquent behaviour (10) (11). On the other hand, authoritative schools offer balance between enforcement of the rules and responsiveness to students' needs. To classify the disciplinary environments in schools, Cornell and Huang (2016) designed an authoritative school climate score (ASC) based on student perceptions of the disciplinary structure and support offered in each school. Disciplinary structure was defined by whether students perceived school rules as fair and reasonable (9). A higher disciplinary structure meant that students were able to explain themselves and were punished fairly. Many benefits have been associated with the authoritative style of discipline such as higher educational aspirations (47) (48), fewer problem behaviours (49), and higher grades (50) (48). For example, the International Youth Development Study in Washington State and Victoria, Australia, surveyed students in grades 7 and 9 and found that the use of out-of-school suspensions predicted increased cannabis use, while teacher counselling resulted in a 50% reduction in cannabis use rates (3); however, reporting students to a nurse or counsellor had no effect on later cannabis use (3).

In 2009, the Ontario Ministry of Education mandated all schools to have a progressive disciplinary policy (29) (33). In line with authoritative approaches, under this policy, schools are to provide students with opportunities to reflect on and learn from their own actions to prevent reoccurrence, with more serious consequences (e.g. suspension or expulsion) reserved for when inappropriate behaviours escalate or are repeated. Principals are advised to consider a *range of options* – including both *consequences* (e.g., an assignment, detention) and *supports* (e.g., a conversation with the student, counselling from a social worker) – to determine the most

appropriate response to each situation, taking into consideration various mitigating factors (e.g., students' history and stage of growth and development, the nature and severity of the behaviour, the impact of the behaviour on the school climate) (51). In addition, schools are suggested to actively engage parents in ongoing conversations as partners.

Despite government mandated policies and procedures in certain regions, there remains limited evidence on what approaches are actually being used by schools. Most schools have consequence measures for the use of cannabis on school property or during school hours, although differences in school-to-school disciplinary approaches exist. This study aims to provide a current picture of the school disciplinary approach environment in the year immediately following cannabis legalization. This chapter will answer research question 1: what disciplinary approaches associated with violating school substance use policies are available in schools specific to cannabis?

2.2 METHODS

2.2.1 Design:

This study used data from Year 7 (2018-19) of the COMPASS study (hereby referred to as COMPASS). The COMPASS study is a nine-year (2012-2021) prospective study designed to collect hierarchical longitudinal data from students in grades 9 through 12 and the secondary schools they attend (52). COMPASS has received approval from the University of Waterloo Human Ethics Committee, the Brock University Research Ethics Board, and all participating school boards. A full description of the COMPASS design is available in print (52) or online (www.compass.uwaterloo.ca).

2.2.2 Data Collection:

  COMPASS uses an online School Policy and Program Scan Tool (SPP) to gather information on the programs, policies, and protocols present within the school related to student health, as well as if changes to the programs and policies have been made over time. The SPP is completed once annually at the same time as the school's student data collection. A member of the school administration that is most familiar with the programs, policies, and protocols in the school is identified and sent an email with a link to the online survey. Schools are also encouraged to consult other staff members and have a small group complete the SPP. A paper copy is provided if preferred. Schools are also asked for a copy of their school policy handbook. The SPP was based on a previously validated Healthy School Planner tool (53) (54) (55) and has an annual response rate of 100%. If any missing, incomplete, or ambiguous responses on the SPP are identified after data collection, study staff follow up with school contacts by phone to clarify.

2.2.3 Sample:

  School-level data was used from year 7 (2018-2019) of the COMPASS study. In Year 7 (2018-2019), 136 secondary schools in British Columbia (BC) (n=15), Alberta (n=8), Ontario (n=61), and Quebec (n=52) participated.

2.2.4 Measures:

  The *first-offence consequences for school cannabis use policy violations* were assessed by the question: "What are the consequences for a first offence for students who are caught violating your school's written policies or practices on marijuana? (Check all that apply)". Schools were categorized based on the potential first-offence disciplinary consequences from the "check all that apply" question. Literature from restorative, restitutive, and punitive disciplinary

approaches (30) (57), and the Ontario Progressive Disciplinary Policy (51), which advises a range of consequences and supports, were utilized to create the categories. In addition, categories were based on the literature assessing school climate scores by applying Baumrind's *Theory of Parenting* (45). Previous studies have scored school climate based on student responses to measures of demandingness and responsiveness about their school (9) (45) (48) (56). To the best of my knowledge, no study has classified school disciplinary approach styles based on the actual disciplinary polices or procedures indicated by schools. Therefore, this study is the first to establish a framework for classifying schools into disciplinary approach styles based on the first-offence disciplinary response measures reported by schools. Responses to first-offence violations of school cannabis policies were categorized as follows:

1. Punitive Consequences (3 items; scored 0-3): "Alert police"; "issue a fine"; and "out-of-school suspension".

2. Supports (i.e., restorative) (3 items; scored 0-3): "Encourage but not require an assistance, education, or cessation program"; "require to participate in an assistance, education, or cessation program"; and "refer to a counsellor".

3. Mild Approaches (2 items; scored 0-2): "Assign additional class work"; and "assign work around school".

4. Moderate Approaches (2 items; scored 0-2): "Detention" and "in-school suspension".

5. Other (4 items; scored 0-4): "Give warning"; "refer to administrator", "confiscate substance", and "inform parents".

Each school was scored for the number of first-offence response options indicated in each of the five categories. Due to the lack of clear categorization for all first-offence disciplinary

response options, the category "other" was developed to encompass options that do not simplistically fit within one of the other categories. Based on the scores that schools received for each category, each school was classified into one specific disciplinary approach style. School disciplinary approach styles were determined as follows:

1. "Authoritarian" was defined as scoring high in punitive first-offence disciplinary approaches (≥ 2 items), low in supportive approaches (< 2 items), and reporting any number of moderate, mild, or other approaches.

2. "Authoritative" was defined as scoring high in both punitive (≥ 2 items) and supportive approaches (≥ 2 items), low in moderate (< 2 items) and mild approaches (< 2 items), and any number of other approaches.

3. "Neglectful" was defined as scoring low in punitive (< 2 items), supportive (< 2 items), any number of moderate approaches, mild approaches (< 2 items), and any number of other approaches.

4. "Permissive/Supportive" was defined as scoring low in punitive (< 2 items), moderate (< 2 item), and mild approaches (≤ 2 items), high in supportive approaches (≥ 2 items), and any number of other approaches.

5. "Other" disciplinary approach style was defined as having a mixed approach, with 2 supportive approaches, 1 punitive approach, 2 moderate approaches, 3 other approaches, and no mild approaches.

Schools were also classified as to whether they use a progressive disciplinary approach for subsequent violations. Whether schools use a *progressive disciplinary approach* for substance use policy violations was assessed by asking: "Do sanctions get stronger with

subsequent violations of alcohol and marijuana use (i.e. progressive discipline approach)?", with the provided response options "always", "sometimes", and "never".

2.2.5 Statistical Analysis:

All analysis was conducted using SAS 9.4 to answer the research question, "what disciplinary approaches associated with violating school substance use policies are available in schools specific to cannabis?" First, descriptive statistics were calculated for school administrator responses to the school disciplinary measure, which used a "check all that apply" response style for a list of 14 disciplinary options for student first-offence violations of school cannabis policies. Specifically, descriptive statistics were used to explore the frequency, mean, distribution, and range that each of the 14 discipline response options were indicated by schools. Differences were explored by school province. Second, each school was scored according to the number of first-offence response options they indicated in each of the above indicated categories (i.e., punitive, moderate, mild, supports, and other first-offence response approaches). Third, the number of first-offence response options in each category was used to classify each school into a school disciplinary approach style (i.e., Authoritarian, Authoritative, Neglectful, Permissive/Supportive, and Other school disciplinary approach styles), according to the above criteria. Schools were also classified according to whether they indicated using a progressive disciplinary approach for subsequent violations.

This scoring approach for school disciplinary approach styles from paper 1 will be used in paper 2 to examine associations with (i) student perceptions of the supportiveness of their school environment for the cessation/prevention of substance use, and (ii) student cannabis use.

2.3 RESULTS

As shown in Figure 1, the mean number of first-offence disciplinary approaches present in secondary schools for violation of school cannabis use policies reported by schools was 7.06 (SD=2.04), when asked to "check all that apply" in a list of 14 possible options. Refer to school administrator (94.9%), confiscate substance (94.2%), and inform parents (86.9%) were the top three most frequently indicated first-offence violation responses indicated by schools, and are all in the 'other' category. Issue a warning was indicated least frequently of the "other" approaches (35.8%). Out-of-school suspension (86.1%) and alert police (75.2%) were the next two approaches indicated by the most schools, both in the punitive consequence category. The other punitive approach, "issue a fine", was the second least frequently indicated option overall (8.8%). The two mild approaches (assign help around the school and additional class work) were the other options indicated by the fewest schools (5.1% and 12.4%, respectively). Out of the three supportive approaches, *encouraging* participation in an assistance, education, or cessation program was most often selected by schools (67.9%), compared to 28.5% of schools that indicated *requiring* participation in a program. Almost half (47.5%) of schools indicated referring students to a counsellor as an option. For the two moderate approaches, in-school suspension was selected more often by schools than detention (39.4% versus 25.5%).

Figure 1. Frequency of selecting various disciplinary response options for student first-offence violations of school cannabis policies by secondary schools (n=136) in Year 7 (2018-2019) of the COMPASS study.
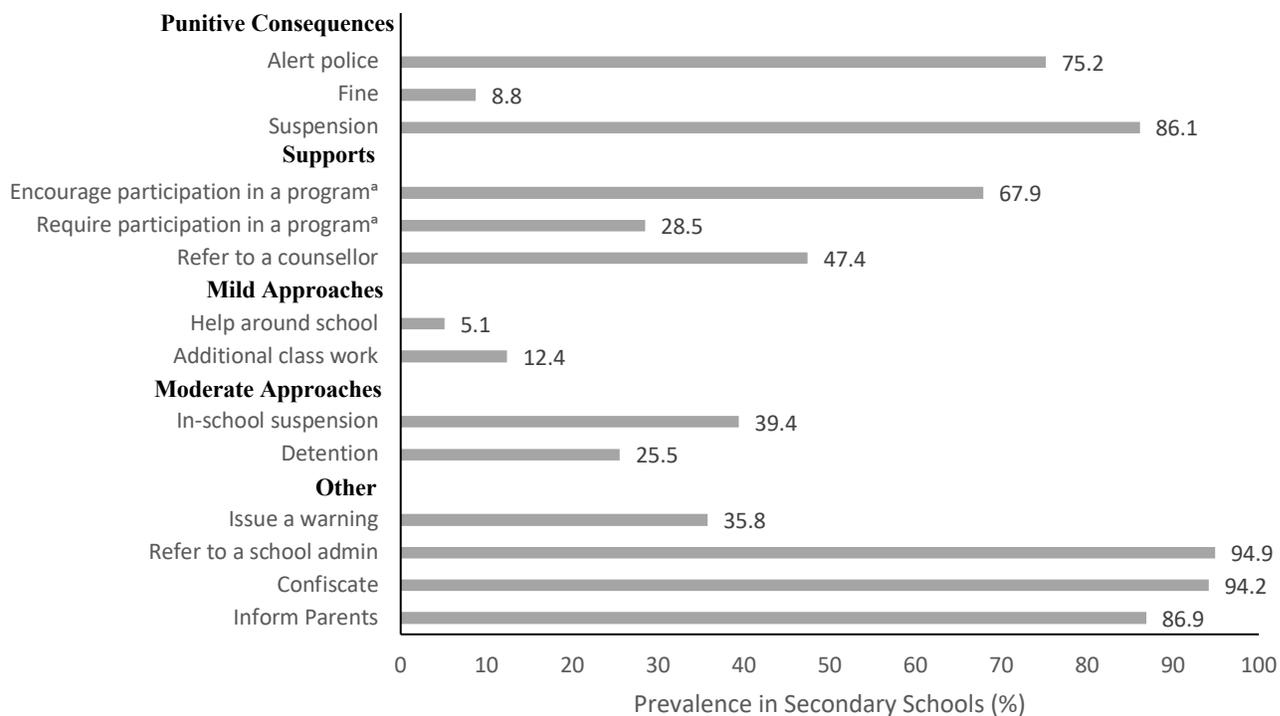
[a] assistance, education, or cessation program.
Notes: The question used a "check all that apply" design. Two Ontario schools did not respond to the question regarding first-offence disciplinary approach violations to substance use.

       Table 1 indicates the frequency of first-offence disciplinary approaches for violation of cannabis policies that were selected by secondary schools per province. The mean number of first-offence response options selected was similar in schools across provinces, from the highest mean of 7.25 (SD= 2.97, Range= 4-13) in BC to the lowest mean of 6.81 (SD= 2.03, Range= 3-14) in Ontario. All schools selected using at least one type of first-offence approach in each category, except for the two Ontario schools that did not respond to the item regarding disciplinary approaches for first-offence violations of school cannabis policies.

For punitive approaches, schools in Quebec (88.5%), Ontario (73.3%), BC (56.3%) and Alberta (50.0%), indicated alerting the police as a first-offence response option. Out-of-school suspension was selected by most schools in all provinces (84.6% of schools in Quebec to 88.3% in Ontario). Issue a fine was rarely selected across provinces, with no BC schools and only one participating Alberta school selecting this option.

For moderate approaches, a higher proportion of schools in Alberta indicated both in-school suspension and detention, relative to schools in other provinces; however, the sample size in Alberta was limited to 8 schools. Few Ontario schools indicated either moderate approach and only 2 of the 16 schools in BC indicated using detention.

In the supportive category, schools in British Columbia selected encouraging participation in an assistance, education, or cessation program (81.3%) and referring the student to a counsellor (75.0%) more often in comparison to schools in other provinces. Encouraging participation in a program was selected by at least half of the schools in each province. Requiring participation in an assistance, education, or cessation program was selected by relatively fewer schools in all provinces. Quebec schools indicated requiring participation in a program most frequently (36.5%) but refer to a counsellor (25.0%) least frequently, compared to participating schools in other provinces.

The two mild approaches were indicated by few schools in any province. No participating schools in Alberta selected assigning help around the school, while 3 British Columbia schools (18.8%), and 2 schools in Quebec (3.8%) and in Ontario (3.3%) indicated this option. Assigning additional class work was selected more often by schools in Quebec (21.2%), compared to 3 schools in British Columbia (18.8%), 2 in Ontario (3.3%), and one Alberta school (12.5%).

Within the other category, refer to an administrator, confiscate substance, and inform parents were indicated by most schools in all provinces. All participating schools in British Columbia and Alberta indicated referring students to a school administrator, and confiscation of the substance was selected by all participating Alberta and Quebec schools. Quebec schools indicated issue a warning as a response option the most commonly (46.2%) and Alberta schools the least (12.5%). Informing parents was selected more often by schools in British Columbia (93.8%) and least often in Ontario schools (85.0%).

Always using a progressive discipline approach, in which sanctions get stronger for subsequent violations, was reported by 89.7% of participating COMPASS secondary schools. All participating schools in Alberta indicated "always" using the progressive discipline approach, followed by schools in Quebec (90.4%), Ontario (90.0%), and British Columbia (81.3%). As no schools indicated they "never" used the progressive disciplinary approach, the remainder indicated "sometimes" using it.

Table 1. Prevalence of disciplinary approach options selected by secondary schools (n=136) for use in response to student violations of school cannabis policies by province in Year 7 (2018-2019) of the COMPASS Study.

	BC (%) N=16	AB (%) N=8	ON (%)[a] N=60	QC (%) N=52	Overall (%) N=136
First-Offence Disciplinary Approach					
Punitive options:					
Alert police	56.3	50.0	73.3	88.5	75.2
Issue a fine	0	12.5	11.7	7.7	8.8
Suspension	87.5	87.5	88.3	84.6	86.1
Supportive options:					
Encourage participation in an assistance, education, or cessation program	81.3	50.0	63.3	73.1	67.9
Require participation in an assistance, education, or cessation program	25.0	12.5	25.0	36.5	28.5
Refer to a counsellor	75.0	62.5	58.3	25.0	47.4
Mild options:					
Assign to help around school	18.8	0	3.3	3.8	5.1
Assign additional class work	18.8	12.5	3.3	21.2	12.4
Moderate options:					
In-school suspension	50.0	75.0	18.3	55.8	39.4
Detention	12.5	62.5	13.3	38.5	25.5
Other options:					
Issue a warning	43.8	12.5	28.3	46.2	35.8
Refer to a school administrator	100	100	93.3	96.2	94.9
Confiscate substance	81.3	100	93.3	100	94.2
Inform parents	93.8	87.5	85.0	88.5	86.9
Progressive discipline: Always	81.3	100	90.0	90.4	89.7
Progressive discipline: Sometimes	18.8	0	8.3	9.6	9.6

[a] Two Ontario schools did not respond to the question regarding first-offence disciplinary approach violations to substance use.

Table 2 displays the categorization results of school disciplinary approach styles, as described in the methods section, and further breaks down the results by school-level characteristics. The schools that did not respond to all variables were removed from this analysis

and a complete case analysis was used, resulting in 131 schools included in the classification

approach.

Table 2. Categorization results of school disciplinary approach styles used by secondary schools (n=131) by province in Year 7 (2018-2019) of the COMPASS Study.

		Authoritarian N=46		Authoritative N=49		Neglectful N=18		Permissive/ Supportive N=15		Other N=3	
		N	%	N	%	N	%	N	%	N	%
Province	BC N=14	2	14.3%	5	35.7%	3	21.4%	4	28.6%	0	0.0%
	AB N=8	2	25.0%	2	25.0%	2	25.0%	2	25.0%	0	0.0%
	ON N=57	15	26.3%	28	49.1%	10	17.5%	4	7.0%	0	0.0%
	QC N=52	27	51.9%	14	26.9%	3	5.8%	5	9.5%	3	5.8%
School Enrolment	0-500	22	35.5%	20	32.3%	10	16.1%	7	11.3%	3	4.8%
	501-1000	19	33.3%	24	42.1%	7	12.3%	7	12.3%	0	0.0%
	1001-1500	5	41.7%	5	41.5%	1	8.3%	1	8.3%	0	0.0%
Urbanicity	Rural/Small Urban	23	37.1%	23	37.1%	8	12.9%	6	9.7%	2	3.2%
	Medium/ Large Urban	23	33.3%	26	37.7%	10	14.5%	9	13.0%	1	1.4%
School area median household income	$25,000-$75,000	39	40.2%	31	32.0%	11	11.3%	13	13.4%	3	2.3%
	$75,000+	7	20.6%	18	52.9%	7	20.6%	2	5.9%	0	0.0%
Progressive Discipline	Always	42	35.0%	45	37.5%	15	2.5%	15	12.5%	3	2.5%
	Sometimes	4	36.4%	4	36.4%	3	27.3%	0	0.0%	0	0.0%

Overall, based on the categorical approach described above, 46 schools were classified as

Authoritarian, 49 schools as Authoritative, 18 as Neglectful, 15 as Permissive/Supportive and 3

as Other. More British Columbia schools were classified as Authoritative (37.5%), followed by

Permissive/Supportive (28.6%). With Alberta's smaller sample size, the eight schools were

evenly divided into Authoritarian, Authoritative, Neglectful, and Permissive/Supportive (25%,

respectively). In Ontario, almost half of the schools were classified as Authoritative (49.1%)

followed by Authoritarian (26.3%); while in Quebec, 51.9% of schools were classified as Authoritarian. Quebec was the only province with schools in the Other category.

School enrolment and urbanicity were similar across all categories of school disciplinary approach styles. The three schools that were classified as Other were in the lowest area median household income category. Schools with the highest area median household income of $75,000+ were more often classified as Authoritative (52.9%). Always using the progressive discipline approach was reported by 37.5% of Authoritative schools and 35% of Authoritarian schools.

2.4 DISCUSSION

This study examined the current disciplinary approach environment associated with violating school substance use policies in the school year immediately post cannabis legalization in Canada (2018-2019). The sample included 136 Canadian secondary schools that participated in the COMPASS study. Most schools were classified as using Authoritarian and Authoritative disciplinary approach styles to student cannabis policy violations. A range of first-offence disciplinary approaches was indicated by participating schools, with referring the student to a school administrator and confiscation of the substance the most frequently selected approaches, followed by informing parents and out-of-school suspension.

Overall, 90% of participating schools indicated they 'always' using the progressive discipline approach. Government mandates for the required use of the progressive discipline in secondary schools varies by province and region. For example, in Ontario, schools are provincially mandated to use a progressive discipline policy (51). In this study, 90% of the participating Ontario schools indicated compliance with always using this approach, while 5 schools indicated only "sometimes" using progressive discipline. However, it should be noted

that the government mandated definition varies from the measure used in this study, which only defines progressive discipline as employing stronger sanctions for subsequent violations of school substance use policy violations. The Ontario government mandate extends further than this definition, in advising that schools in the province consider a range of consequences and supports, taking into account mitigating factors, such as the student's history of misconduct, to determine the most appropriate way to respond to each situation (51). The Ontario Progressive Disciplinary Policy also advises schools to help students learn from their choices and to engage parents in an ongoing dialogue of students' behaviour to ensure early and ongoing intervention (39). In this study, 85% of Ontario schools reported engaging the students' parents in regards to cannabis policy first-offence violations. In comparison, 92% of participating Ontario COMPASS schools in the 2017/2018 school year indicated engaging parents (46). This finding may suggest a potential decrease in compliance with this mandate post-legalization; however, the change in participating Ontario schools may account for this difference. Further research is needed to identify the specific consequences used by schools that follow a progressive discipline approach, and how these consequences are decided upon to further elucidate the most effective comprehensive strategies.

Based on previous literature (58) (51) (57), the provided disciplinary response options for student first-offence violations of school cannabis policies were categorized as punitive, supportive, mild, moderate, and other approaches. Three 'other' approaches were indicated most commonly by schools: referring the student to a school administrator, confiscation of the substance, and inform parents. It seems likely that referring students to the school administrator and confiscating the substance are first steps and typically followed by additional disciplinary action. That is, upon violating the school cannabis policies, a student may be referred to the

school administrator in order to decide on a disciplinary approach. The fourth 'other' approach was to give a warning, which may reflect what occurs when no disciplinary approach was decided on after referral to an administrator. About one-third of schools indicated giving a warning as a first-offence violation response option.

Following the three 'other' approaches, the punitive approach of out-of-school suspension was the most commonly selected by schools among the first-offence disciplinary options. Overall, 86% of participating schools selected this approach. Out-of-school suspension was selected more frequently by participating schools than the previous year of the COMPASS study, immediately before cannabis legalization (22). Previous research found the use of out-of-school suspensions for substance use policy violations to be associated with increased school-wide student substance use (3). The use of suspensions has also been linked to disengagement from school, delinquency, and antisocial behaviours (49) (50). Alerting the police, another punitive approach, was the next most frequently indicated discipline response in the overall sample, with three-quarters of participating schools indicating this option. More schools in Quebec indicated alerting the police from the options provided (89%), compared to about half to three-quarters of participating schools in other provinces. Alerting the police is not a legal requirement of schools by the Federal Government in Canada, despite cannabis use remaining illegal among youth and on school properties. At the provincial level, principals are advised to consider mitigating factors when deciding whether to alert the police in discretionary situations (48). As there has been a movement away from stricter and zero-tolerance policies, it is possible that police are infrequently involved and remain among the set of options selected by schools from times when more punitive tactics were common. In support, fewer schools indicated alerting the police as a discipline response for first-offence violations of school cannabis policies

than in previous school year, when 80% of participating COMPASS schools selected this option (46). Future study waves will be needed to determine if this reduction indicates a movement away from police involvement by schools for responding to student substance use.

Overall, supportive options as first-offence disciplinary approaches were indicated less commonly than punitive first-offence disciplinary approaches. Schools in British Columbia indicated encouraging participation in an assistance, education, or cessation program more often than schools in other provinces (81%), consistent with the previous school year (22). In the 2017/2018 school year, 63% of BC schools indicated using this approach, showing a potential increase (22). Encouraging participation in an assistance, education, or cessation program was the more commonly used supportive approach overall, both in the year preceding legalization and the year immediately post-legalization (22); while requiring participation in a program was the least frequently indicated supportive approach (29%). Previous research suggests the use of supportive approaches promotes more positive outcomes for students. For example, referring students to a counsellor has been shown to decrease student substance use by almost 50% (3). In Ontario, schools are encouraged to offer students supportive approaches as disciplinary actions (51). However, referring students to a counsellor was only selected by 58% of participating Ontario schools (22). In terms of the other categories, few schools indicated using the mild first-offence disciplinary approaches of assigning students to help around the school and assigning additional classwork. Limited literature has explored the effectiveness of these disciplinary response measures. For moderate approaches, the Alberta schools tended to select in-school suspension and detention more often than schools in other provinces, albeit there were only 8 participating schools from the province.

Based on previous literature on school disciplinary styles and Baumrind's Theory of Parenting (12) (36) (45) (49), a classification scoring approach for this study was developed. Based on the response options selected for student first-offence cannabis policy violations, schools were classified into five main disciplinary approach style categories: Authoritarian (high punitive, low support), Authoritative (high punitive, high support), Neglectful (low punitive, low support), Permissive/Supportive (low punitive, high support), and Other (a mixed approach). Categories were based on Baumrind's Theory of Parenting, which identifies three clusters of disciplinary styles: authoritative, authoritarian, and permissive (12). She found that there were two types of permissive parents, those who do not wish to inhibit their children, and parents who avoid responsibility of their children. Authoritative parenting was characterized by a high level of demandingness (i.e. high standards) and responsiveness (i.e. open communication) for their child; whereas authoritarian parents had a high level of demandingness, but low responsiveness (12). Several researchers have applied the theory of parenting to school climate and categorized schools based on student-reported measures of disciplinary demandingness and responsiveness (33) (36) (45); however, no previous studies have used school-level measures to classify disciplinary environments.

Most schools were categorized as using either an authoritative or authoritarian approach to discipline related to student cannabis policy violations. About half of the participating Quebec schools were classified as authoritarian, while about the same proportion of Ontario schools were authoritative. Forty-nine schools indicated at least two first-offence approaches from the supportive and punitive categories, corresponding to the high structure and responsiveness characterizing authoritative styles. The hypothesized benefit of using an authoritative approach is that students become more engaged when they are in a structured environment, where they feel

encouraged and supported (59). Furthermore, studies that have classified schools using student perceptions of responsiveness and demandingness measures have associated authoritative practices with lower truancy and dropout rates than authoritarian approaches (45). Within participating COMPASS schools, 48 of the 136 schools were categorized as using an authoritarian approach to discipline, which reflects a strict, obedient, and "zero-tolerance" environment. These schools indicated at least two of the three punitive disciplinary response options and no more than one supportive action. The authoritarian approach has generally been associated with increased delinquency, higher academic demand, and higher dropout rates (45) (60); however, in these studies, school disciplinary styles were classified according to student perceptions and not school protocols.

Fifteen of the 136 participating schools were classified as permissive/supportive, defined by at least two of the three supportive approaches and no more than one punitive and moderate approach, and any number of other or mild approaches. Schools with a permissive/supportive disciplinary approach have been described as placing low demands on students (45). When classified by student perceptions, this category has been linked to lower achievement and school engagement, and higher rates of problem behaviours (45). Lastly, eighteen schools were classified into the neglectful category, which was characterized by low supportive approaches and low punitive approaches. Little research has been conducted on this school disciplinary approach category (61). Baumrind's theory of parenting offers some insight into this classification, characterizing neglectful as minimal effort, inconsistency, and often sporadic disciplinary practices (45). Further research on how school disciplinary styles relate to student substance use is necessary, in order to inform evidence-based approaches for schools.

2.5 LIMITATIONS AND STRENGTHS

Several limitations of this study warrant consideration. The use of the school administrator survey creates the possibility of social desirability and recall biases, although the survey is designed to be filled out by a school staff member most knowledgeable about the programs and policies implemented within the school and is encouraged to be completed as a group to gather the most accurate information. Additionally, school Knowledge Brokers follow up with the schools regarding any unclear or missing responses by phone or email. However, it is plausible that the respondents were unaware of how policies are being implemented. It is important to note that the question assessing first-offence approaches used a "check all that apply" design, and therefore, the responses may not accurately reflect the usual consequences used by school administrators. That is, the data does not allow analysis of how frequently each first-offence disciplinary approach is utilized by a school, or under what circumstances (e.g., cannabis possession, use, or distribution) schools will choose to use specific disciplinary approaches. It is likely that similar to policies mandated in Ontario, school administrators in other provinces take mitigating factors into account when deciding on appropriate responses to cannabis policy violations. Future qualitative research should explore how these decisions are being made. Schools may also be more likely to use certain disciplinary approaches in response to having higher prevalence rates of student cannabis use.

2.6 CONCLUSION

This study shows the current disciplinary approach environment related to student violations of school cannabis policies in participating Canadian secondary schools in the school year immediately following legalization. Schools reported using a range of first-offence

disciplinary approaches. The most common approaches ranged from responses that were classified as other, due to difficulty fitting these options into standard categories of supports or penalties (i.e. refer to a school administrator and confiscating the substance), to more punitive consequences (i.e. out-of-school suspension and alerting the police). All Alberta schools, and most Ontario, Quebec, and British Columbia schools, indicated they always use a progressive discipline policy, where sanctions become stricter with subsequent offences. Based on disciplinary options reported by schools for first-offence cannabis policy violations, most schools were classified as using authoritative and authoritarian approaches, with fewer schools using neglectful, permissive/supportive, and other styles. Future research will explore these categories in association with (i) student perceptions of school supportiveness for the cessation/prevention of substance use, and (ii) student cannabis use, to offer insight into school context that may deter youth early-onset cannabis use. Additionally, research involving qualitative interviews to examine how and why schools select first-offence disciplinary approaches would be a beneficial next step.

Chapter 3

3.1 INTRODUCTION

Cannabis use during adolescence can have detrimental impacts on physiological, social, and psychological development (25). For instance, adolescent cannabis use is associated with higher risk of developing cannabis dependence (62) and school dropout (63) (64). With the recent legalization of cannabis in Canada, the prevention and delay of youth cannabis use has become a public health priority. Legalization of cannabis use among adults can indirectly affect youth through normalization, reduced risk perceptions, and de-stigmatization (56) (31). Young

people continue to report the highest rates of cannabis use among Canadians (55). In the first quarter of 2019, 29.5% of 15-24 year olds reported using cannabis in the last three months (65).

Schools can have important implications for reducing substance use in youth (29)(30), as the location where almost all youth, regardless of SES, spend majority of their week. Research suggests student perceptions of their school climate have robust protective effects for health-risk behaviours such as substance use (66). Students who feel less connected to their school environment experience an increased risk of cannabis, alcohol, and tobacco use (30) (67) (68) (69) (70). While schools are not reasonably expected to prevent all substance use, at a minimum, school policies aim to regulate the frequency and location of substance use behaviours within and around the school property (24). School policies and disciplinary approaches also play a role in setting norms and guidelines for student behaviours (3), and students' perceptions of the approval or disapproval of substance use in their social context influences their own use (31). It is imperative to investigate what is happening within the school environment at a disciplinary approach level in attempt to deter substance use, and to involve students in studying school protocols, as the individuals impacted first-hand (45). While many researchers have suggested connections, scant research has examined student perceptions in relation to school disciplinary approaches.

Previous research has applied the theory of parenting to school climate (12) (36) (45) (49). Baumrind's theory of parenting identifies three clusters of parenting disciplinary styles: authoritative, authoritarian, and permissive (12). She found that there were two types of permissive parents, those who do not wish to inhibit their children, and parents who avoid responsibility of their children. Authoritative parenting was characterized by a high level of demandingness (i.e. high standards) and responsiveness (i.e. open communication) for their

child; whereas authoritarian parents had a high level of demandingness, but low responsiveness (12). To classify the disciplinary environments in schools, Cornell and Huang (2016) designed an authoritative school climate score (ASC) based on student perceptions of the disciplinary structure and support offered in each school. Disciplinary structure was defined by whether students perceived school rules as fair and reasonable (9). A higher disciplinary structure meant that students felt able to explain themselves and that they were punished fairly. When students perceived the rules as fair, they were more willing to comply with them (9) (71). On the other hand, authoritarian schools were defined as implementing rules that were perceived as strict and controlling. Schools with higher ASC scores experienced lower levels of alcohol and cannabis use, less bullying, fighting, and weapon-carrying at school (9). However, scores were based on student perceptions; the policies and procedures that the schools used were not assessed. Research on student perceptions of schools with varying protocols and supports may help inform the design of more effective approaches to deter substance use.

Building on previous research that has examined student perceptions of school climate in relation to substance use (9) (45), this chapter will explore whether school disciplinary styles are associated with student cannabis use and their perceptions of school support for the prevention and cessation of substance use. Participating schools will be categorized as using varying disciplinary approach styles based on their responses to student first-offence violations of school substance use policies. It is proposed that different school disciplinary approach styles will have varying associations with student cannabis use via student perceptions of school supportiveness for the prevention and cessation of substance use. For instance, students attending schools with more responsiveness towards students, such as authoritative schools, are expected to have lower cannabis use (9). Furthermore, schools with higher responsiveness and supportive options for

their students (i.e. authoritative and permissive/supportive schools) will likely have more

students report they feel more supported in the prevention and cessation of substance use, than

their peers attending schools with lower responsiveness and supports (i.e. authoritarian schools).

Using the classifications of school disciplinary approaches, the proposed relationships

are illustrated in figure 1.

In this chapter, the following research questions will be addressed:

RQ2.) Are school cannabis use policy violation disciplinary approaches associated with

student cannabis use?

RQ3.) Are school disciplinary approaches associated with student perceptions of school

support for the cessation and prevention of substance use?

RQ4.) Do student perceptions of school support (for the prevention and cessation of

substance use) mediate the association between school disciplinary approaches and student
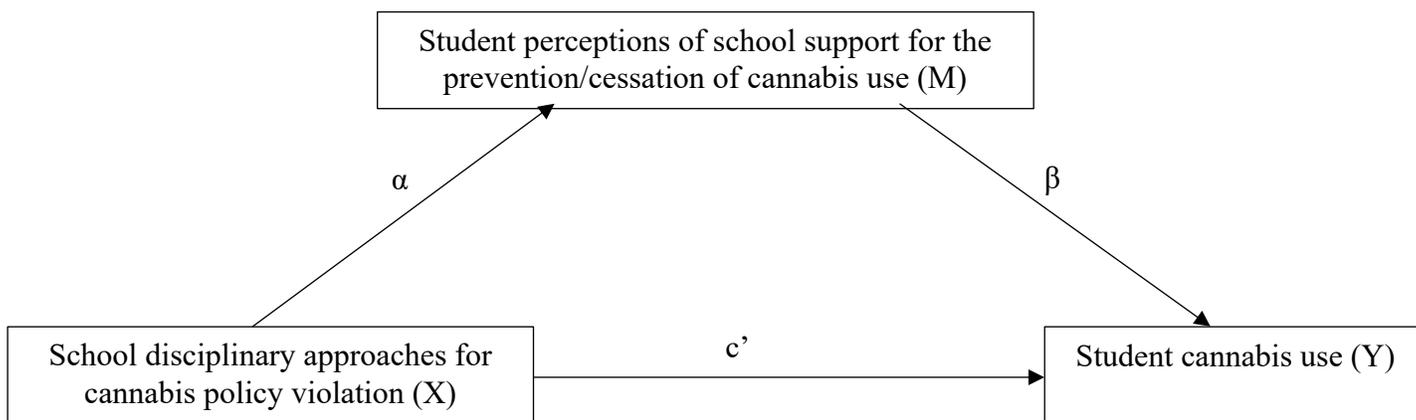
cannabis use?

Figure 1. The hypothesized mediation model showing the direct and indirect pathways between school disciplinary approach context, student perceptions of school support, and student cannabis use.

3.2 METHODS

3.2.1 Design:

COMPASS (Cannabis, Obesity, Mental health, Physical activity, Alcohol, Smoking, Sedentary behaviour) is an ongoing (2012-2021) longitudinal study designed to collect hierarchical data once annually from students in grades 9 through 12 and the secondary schools they attend (52). A full description of the COMPASS study is available in print (52) and online (www.compass.uwaterloo.ca). All procedures received ethics approval from the University of Waterloo and Brock University Research Ethics Committees and all participating school boards.

Schools were purposely selected based on whether they permitted active-information passive-consent protocols, which are critical for collecting robust data on youth substance use (52). All grade 9 through 12 students attending participating schools were eligible to participate and could decline at any time. Further details of recruitment methods are described elsewhere (53).

3.2.2 Data Collection:

Student data is collected once annually from full school samples during class time through the use of a pen and paper student questionnaire (C_q). The Year 7 student-level questionnaire is 16 pages and designed to be able to be completed during one class period (approximately 45 minutes). The anonymity maintained throughout the research process is important to enable students to feel comfortable to accurately answer questions on sensitive material (e.g., questions on substance use, bullying, mental health, and more). The questionnaire is based on previously validated national surveillance tools and guidelines (72) (53) (73).

COMPASS additionally uses an online School Policy and Program Scan Tool (SPP) to assess the program and policies present within the school related to each of the health domains assessed in the student questionnaire, and if there have been any changes made over time. The questionnaire is completed once annually at the same time as the school's student data collection. A member of the school administration that is most familiar with the programs and policies in the school is identified and sent an email with a link to complete the online survey. School contacts are encouraged to consult with other staff members and have a small group complete the SPP, if needed. Additionally, COMPASS school knowledge brokers follow up with staff to clarify any unclear or missing responses. The SPP was based on a previously validated Healthy School Planner tool (53) (54) (55).

3.2.3 Participants:

Student-level and school-level data was used from year 7 (2018-2019) of the COMPASS study, as the most recent wave available and the year immediately following cannabis legalization. In year 7, 74,501 students attending 136 secondary schools in British Columbia (10,402 students, 15 schools), Alberta (3301 students, 8 schools), Ontario (30,675 students, 61 schools), and Quebec (30,123 students, 52 schools) completed the student questionnaire.

3.2.4 Measures:

The COMPASS student questionnaire (Cq) was used to measure student sociodemographic variables, cannabis use, and how supportive they perceive their schools to be for the prevention and cessation of substance use. *Cannabis use* was assessed by asking students: "In the last 12 months, how often did you use marijuana or cannabis?" Students will be classified as "never cannabis users" if they have never used cannabis; "non-current cannabis users" if they have not

used cannabis in the last month; and "current cannabis users" if they have used cannabis once a month in the last 12 months, up to everyday use. This measure is consistent with the national surveillance measures on cannabis use (19). *Student perceptions* of the school environment was assessed by asking the question: "How supportive is your school in giving students the support they need to resist or quit drugs and/or alcohol?" Student responses include: "supportive" or "very supportive", and "unsupportive" or "very unsupportive".

Questions from the SPP were used to assess schools' use of first-offence disciplinary consequences for cannabis policy violations and if sanctions get stronger with subsequent violations (i.e. progressive discipline approach). *The first-offence consequences for school substance use policy violation* were assessed by the question: "What are the consequences for a first offence for students who are caught violating your school's written policies or practices on marijuana? (Check all that apply)". Schools were categorized based on the potential first-offence disciplinary consequences from the 'check all that apply' question. Literature from restorative, restitutive, and punitive disciplinary approaches (30) (57), and the Ontario Progressive Disciplinary Policy (51), which advises a range of consequences and supports, were utilized to create the following categories. In addition, categories were based on literature assessing school climate scores by applying Baumrind's *Theory of Parenting* (45). Previous studies have scored school climate based on student responses to measures of demandingness and responsiveness about their school (9)(45) (48) (56). This work was used to establish the following categorization framework, as described in a previous study (Paper 1 of this thesis). The first-offence violations of school cannabis policies were categorized as follows:

1. Punitive Consequences (3 items; scored 0-3): "Alert police"; "issue a fine"; and "out-of-school suspension".

2. Supports (i.e., restorative) (3 items; scored 0-3): "Encourage but not require an assistance, education, or cessation program"; "require to participate in an assistance, education, or cessation program"; and "refer to a counsellor".

3. Mild Approaches (2 items scored 0-2): "Assign additional class work"; and "assign work around school"

4. Moderate Approaches (2 items; scored 0-2): "Detention" and "in-school suspension".

5. Other (4 items; scored 0-4): "Give warning"; "refer to administrator", "confiscate substance", and "inform parents".

Based on these scores, each school was classified into a specific disciplinary approach style. The categories are as listed:

1. "Authoritarian" was defined as scoring high in punitive first-offence disciplinary approaches (≥ 2 items), low in supportive approaches (< 2 items), and reporting any number of moderate, mild, or other approaches.

2. "Authoritative" was defined as scoring high in both punitive (≥ 2 items) and supportive approaches (≥ 2 items), low in moderate (< 2 items) and mild approaches (< 2 items), and any number of other approaches.

3. "Neglectful" was defined as scoring low in punitive (< 2 items), supportive (< 2 items), any number of moderate approaches, mild approaches (< 2 items), and any number of other approaches.

4. "Permissive/Supportive" was defined as scoring low in punitive (< 2 items), moderate (< 2 item), and mild approaches (≤ 2 items), high in supportive approaches (≥ 2 items), and any number of other approaches.

5. "Other" disciplinary approach style was defined as having a mixed approach, with 2

   supportive approaches, 1 punitive approach, 2 moderate approaches, 3 other approaches,

   and no mild approaches.

Among the 136 participating schools, 49 were classified as Authoritative, 46 as

Authoritarian, 15 as Permissive/Supportive, 18 as Neglectful, and 3 schools were classified into

the Other category.

Whether schools use a *progressive disciplinary approach* for subsequent cannabis and

alcohol policy violations was assessed by asking: "Do sanctions get stronger with subsequent

violations of alcohol and marijuana use (i.e., progressive discipline approach)?", with the

provided response options "always", "sometimes", and "never".

3.2.5 Covariates

Student-level covariates included: sex (male, female); grade (9, 10, 11, 12, Secondary I-

II); race/ethnicity (White, Nonwhite/mixed [including students indicating Black, Asian, Latin

American or Hispanic, other, Indigenous [First Nations, Metis, Inuit], or more than one

response); smoking status (non-smoker, current smoker [reported smoking one or more cigarettes

in the past month]); and binge drinking (non-binge drinker, current binge drinker [reported binge

drinking one or more times in the past month]). Student weekly spending/saving money ($0, $1-

$20, $21-$100, more than $100, I don't know) from allowance or part-time employment was

also included as an indicator of student-level socioeconomic status (SES) in lieu of parental

measures of SES and given known links to youth substance use (10).

School-level covariates included province (Ontario, Alberta, Quebec, British Columbia),

school-area median household income (using data from the 2016 Census on census divisions that

corresponded with school postal codes) (74), size/enrollment, and urbanicity. Urbanicity was determined based on school postal codes and Statistics Canada classifications of "rural". "small", "medium" and "large urban" areas (75).

3.2.6 Statistical Analysis

Analysis was conducted in SAS 9.4. To test RQ2, "are differences in substance use disciplinary approaches associated with cannabis use?", a preliminary regression was run with student cannabis use by school ID to determine the intraclass coefficients, indicating the proportion of the variation in student cannabis use explained at the school and province levels. Next, multilevel logistic regression models tested: (i) whether school disciplinary approach styles are associated with student cannabis use, and (ii) whether the use of the progressive disciplinary approach is associated with student cannabis use. Models controlled for student (sex, grade, race/ethnicity, spending money, smoking status, and binge drinking) and school (province, size/enrollment, school-area median household income and urbanicity) covariates, and student-level clustering within schools.

For RQ3, "Are differences in substance use disciplinary approaches associated with student perceptions of school support for the cessation and prevention of substance use?", multilevel logistic regression models tested: (i) whether first-offence disciplinary consequences are associated with student perceptions of school support for the prevention/cessation of substance use, and (ii) whether the use of the progressive disciplinary approach is associated with student perceptions of school support for the prevention/cessation of substance use, both adjusting for the same covariates listed for RQ2.

To test RQ4, "do student perceptions of school support (for the prevention and cessation of substance use) mediate the association between school disciplinary approaches and student

cannabis use?", an exploratory mediation model was conducted according to the pathway

diagram in Figure 1, adjusting for the same covariates listed for RQ2. A series of regressions was

conducted to individually test the mediating effects of student perceptions on cannabis frequency

and the school disciplinary approach style, followed by the Sobel test. Mediation was tested for

(i) school disciplinary approach styles, and (ii) use of the progressive disciplinary approach.

3.3 RESULTS

A total sample of 74,501 students from schools in British Columbia, Alberta, Ontario and

Quebec participated. A complete case analysis was used, excluding participants that did not

respond to all variables included in the final data analysis, leaving 68,037 students in the analytic

sample. Additionally, two Ontario schools that did not respond to the first-offence disciplinary

response question were removed from the dataset.

3.3.1. Missing data analysis

Missing data analysis results are presented in the Appendix. Supplementary table 1

displays the data analysis for predicting "missing" student cannabis use by school disciplinary

approach categories and the progressive discipline approach. Similar significant findings

resulted, and there was no significant association with the disciplinary approach categories or the

progressive discipline approach with "missing" student cannabis use data. Supplementary Table

2 displays the results for the data analysis predicting "missing" data for the perceptions of

support for the prevention and cessation of substance use by school disciplinary approach

categories and the progressive discipline approach. There was no significant association between

school disciplinary approach category or "always" using the progressive discipline approach

with "missing" data for student perceptions of support for the prevention and cessation of substance use.

Table 1 provides sample descriptive statistics and chi-square tests by student-reported current cannabis use, non-current cannabis use, and never use. Student-reported current cannabis use was highest in Alberta (18.1%), followed by Ontario (17.4%), and lowest in Quebec (8.3%). In Quebec, 80.0% of students reported never using cannabis. Current and noncurrent cannabis use were more frequent in higher grades, with grade 12 students reporting the highest current cannabis use rates at 23.5% compared to 8.8% of grade 9 students. Additionally, males had higher current cannabis use rates compared their female counterparts (14.8% versus 10.9%), but lower noncurrent use (12.4% versus 14.3%). Students that reported current binge drinking and tobacco smoking were more likely to also report current cannabis use (43% and 63.7%, respectively). Students with more available spending money reported current and noncurrent cannabis use more frequently, with students that had over $100 of available weekly spending money reporting the highest rates of current cannabis use (23.6%). At the school level, reported current and noncurrent cannabis use was highest in medium urban areas (20.0%, 17.1%), lower enrolment schools (0-500) (15.4%, 14.1%), and in areas with median household incomes of $75,000-$100,000 (15.4%, 14.3%). Students who perceived their school to be very unsupportive in the prevention and cessation of substance use reported the highest current and noncurrent cannabis use rates (24.0%, 17.4%), followed by students who perceived their school as unsupportive (14.1%, 16.2%), relative to students perceiving their school as supportive (9.5%, 12.1%) and very supportive (9.6%, 8.4%).

Table 1. Student and school-level descriptive statistics and chi-square tests for differences by student-reported cannabis use in Year 7 (2018-2019) of the COMPASS Study (n=68,037).

		Current cannabis use (n=8800)		Non-current cannabis use (n=9122)		Never use (n=50115)		Chi-square p-value
		n	%	n	%	n	%	
Student-Level Characteristics								
Province	Alberta	554	18.1%	517	16.8%	1998	65.1%	<.0001
	British Columbia	1137	12.2%	1069	11.5%	7113	76.3%	
	Ontario	4780	17.4%	4239	15.3%	18477	67.3%	
	Quebec	2329	8.3%	3297	11.7%	22527	80.0%	
Grade	9	1392	8.8%	1347	8.7%	12929	82.6%	<.0001
	10	2101	13.4%	2253	14.3%	11422	72.3%	
	11	2672	18.1%	2989	20.1%	9168	61.8%	
	12	1999	23.5%	1873	22.1%	4623	54.4%	
	Other[a]	514	4.1%	568	4.5%	11585	91.5%	
Sex	Female	3712	10.9%	4861	14.3%	25386	74.7%	<.0001
	Male	4926	14.8%	4178	12.4%	24384	72.8%	
Race/ Ethnicity	White	5852	12.4%	6639	14.1%	34749	73.6%	<.0001
	Non-White/Mixed	2885	14.2%	2432	12.0%	15032	73.9%	
Binge Drinking	No	3090	11.8%	4988	18.9%	18325	69.3%	<.0001
	Current	5103	43.0%	3205	27.0%	3569	30.0%	
Smoking Status	No	3035	32.6%	3333	35.7%	2963	31.7%	<.0001
	Current	358	63.7%	1091	22.0%	710	14.3%	
Weekly Spending Money	$0	832	7.7%	844	7.9%	8976	84.4%	<.0001
	$1-$20	1502	9.2%	1717	10.7%	13012	80.2%	
	$21-$100	2362	15.2%	2557	16.5%	10590	68.0%	
	$100+	3097	23.6%	2834	21.5%	7176	54.8%	
Student perceptions of school support	Very supportive	1201	9.6%	1045	8.4%	10209	82.0%	<.0001
	Supportive	2407	9.5%	3090	12.1%	19979	78.4%	
	Unsupportive	2893	14.1%	3318	16.2%	14301	69.7%	
	Very unsupportive	2299	24.0%	1669	17.4%	5626	58.6%	
School-Level Characteristics								
Urbanicity	Rural	187	6.5%	285	9.9%	2424	83.7%	<.0001
	Small Urban	2998	13.9%	3090	14.4%	15422	71.7%	
	Medium Urban	1314	20.0%	1122	17.1%	4129	62.9%	
	Large Urban	4301	11.6%	4624	12.5%	28140	75.9%	
Enrolment	0-500	2561	15.4%	2345	14.1%	11742	70.5%	<.0001
	501-1000	4933	13.1%	5198	13.9%	27408	73.0%	
	1001-1500	1227	9.2%	1500	11.2%	10671	79.7%	
School area median household income	$25,000-$50,000	946	9.5%	1174	11.8%	7866	78.8%	<.0001
	$50,001-$75,000	5325	13.1%	5474	13.5%	29818	73.4%	
	$75,001-$100,000	2032	15.4%	1890	14.3%	9316	70.4%	
	$100,000+	497	11.8%	584	14.0%	3115	74.2%	

Note: Students that did not respond to all variables in the model were removed. Additionally, the two Ontario schools that did not respond were removed from the dataset.
[a] Secondary I-II in Quebec schools.

Figure 2 displays the prevalence of student cannabis use by perceptions of school supportiveness. Students reporting current cannabis use were more likely to perceive their school as "very unsupportive" in the prevention and cessation of substance use (26.1%) relative to noncurrent and never users. Students reporting never using cannabis were more likely to perceive their school as very supportive (20.4%) or supportive (39.9%) in the prevention and cessation of substance use, relative to their peers reporting current and noncurrent cannabis use.

Figure 2. Student perceptions of school supportiveness for the prevention and cessation of substance use and cannabis use frequency in Year 7 (2018-2019) of the COMPASS Study.
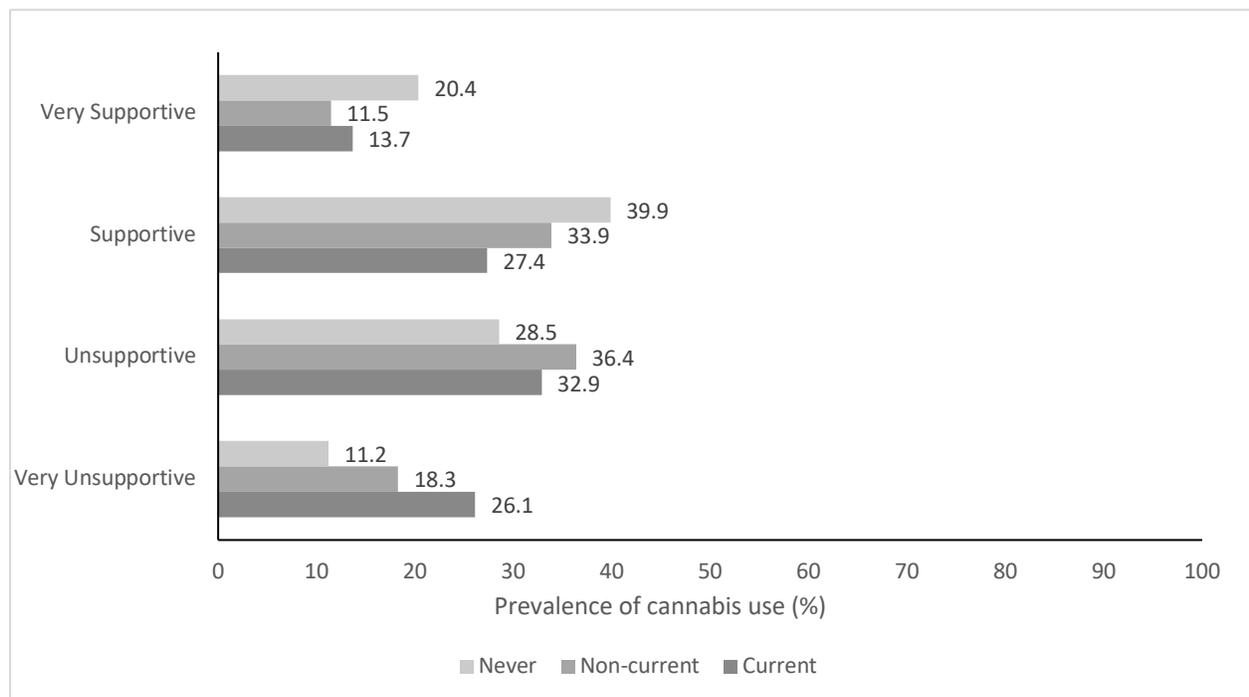
Table 2 provides descriptive statistics and chi-square tests for cannabis use and student perceptions of support for the prevention and cessation of substance use by the disciplinary approach category of the school they attend, as defined above in the methods.

Table 2. Descriptive Statistics and Chi- Square tests for differences between school disciplinary approach categories with cannabis frequency and student perceptions in Year 7 (2018-2019) of the COMPASS Study (N=67669).

	School Disciplinary Approach Category					
	Authoritarian N (%) N= 46	Authoritative N (%) N=49	Neglectful N (%) N=18	Permissive/ Supportive N (%) N=15	Other N (%) N=3	Chi-square p-value
Cannabis Use Frequency						
Current	2841 (11.7%)	3675 (13.8%)	1220 (13.8%)	916 (12.7%)	71 (9.7%)	<.0001
Non-Current	3141 (13.0%)	3634 (13.7%)	1253 (14.1%)	935 (13.0%)	103 (14.3%)	
Never	18280 (75.3%)	19296 (72.5%)	6395 (72.1%)	5354 (74.3%)	555 (76.1%)	
Student Perceptions of School Support for the Prevention and Cessation of Substance Use						
Very Supportive	4505 (18.6%)	4791 (18.0%)	1465 (16.5%)	1493 (20.7%)	156 (21.4%)	<.0001
Supportive	9150 (37.7%)	9809 (36.9%)	3298 (37.2%)	2799 (38.9%)	313 (43.0%)	
Unsupportive	7278 (30.0%)	8116 (30.5%)	2800 (31.6%)	1978 (27.5%)	205 (28.1%)	
Very Unsupportive	3329 (13.7%)	3889 (14.6%)	1305 (14.7%)	935 (13.0%)	55 (7.5%)	

Students attending schools classified as using an Authoritative or Neglectful disciplinary approach style reported the highest current cannabis use rates (13.8%; 13.8%), while students at Other schools reported the lowest current use rates (9.7%), relative to their peers at schools in the alternative categories. Never use and non-current cannabis use were highest among students attending schools in the Other category (76.1%; 14.3%). Students were most likely to perceive their school as very supportive or supportive for the prevention and cessation of substance use if they attended schools classified as Permissive/Supportive and Other, and least likely if they attended Neglectful schools. On the contrary, Neglectful and Authoritative schools had the

highest proportion of students with perceptions of their school being unsupportive in the prevention and cessation of substance use.

Table 3 shows the results of the regression models for the school disciplinary approach categories (Model 1) and use of the progressive disciplinary approach (Model 2) predicting student current cannabis use, relative to non-current cannabis use. Non-current cannabis use included students who reported not using cannabis in the past month, including students who had never used cannabis. The school-level ICC indicated that 5.96% of the variance in student-reported cannabis use is due to differences at the school-level, and the province-level ICC indicated 4.66% of the variance in student-reported current cannabis use is due to differences at the province level.

Table 3. Logistic regression models predicting current student cannabis use by school disciplinary approach categories and the progressive discipline approach, adjusting for individual and school-level characteristics in Year 7 of the COMPASS Study (2018-2019).

		Model 1 N= 53959		Model 2 N=52633	
		OR	95% CI	OR	95% CI
Student-Level Characteristics:					
Grade (ref: 9)	10	1.03	(0.94, 1.14)	1.02	(0.93, 1.13)
	11	1.09	(0.99, 1.20	1.09	(0.99, 1.20)
	12	1.02	(0.91, 1.14)	1.01	(0.90, 1.13)
	Other [a]	0.70	(0.60, 0.81)***	0.69	(0.60, 0.81)***
Sex (ref: female)	Male	1.48	(1.39, 1.57)***	1.49	(1.40, 1.59)***
Race/Ethnicity (ref: White) [b]	Non-White/ Mixed	1.22	(1.13, 1.31)***	1.23	(1.14, 1.32)***
Binge Drinking (ref: Never)	Current	3.34	(3.12, 3.58)***	3.34	(3.12, 3.58)***
Smoking Status (Ref: Never)	Current	3.27	(2.99, 3.58)***	3.29	(3.00. 3.61)***
Weekly Spending Money (Ref: over $100)	$0	0.66	(0.59, 0.74)***	0.66	(0.59, 0.73)***
	$1-$20	0.76	(0.71, 0.85)***	0.79	(0.59, 0.63)***
	$21-$100	0.88	(0.82, 0.95)**	0.89	(0.82, 0.96)**
School-Level Characteristics:					
Urbanicity (ref: Small Urban)	Rural	1.05	(0.72, 1.54)	0.95	(0.62, 1.45)
	Medium Urban	1.51	(1.15, 2.01)**	1.54	(1.15, 2.06)**
	Large Urban	1.44	(1.14, 1.71)**	1.37	(1.12, 1.66) **
Enrolment (ref: 501-1000)	0-500	1.10	(0.93, 1.31)	1.10	(0.92, 1.30)
	1001-1500	1.11	(0.84, 1.46)	1.13	(0.92, 1.30)
School Area Median Household Income (ref: $50,000- $75,000)	$25,000-$50,000	0.93	(0.72, 1.21)	0.96	(0.75. 1.24)
	$75,000-$100,000	1.04	(0.82, 1.30)	1.10	(0.88, 1.38)
	$100,000+	0.99	(0.68, 1.43)	1.02	(0.67, 1.53)
School Disciplinary Approach Category (Ref: Authoritarian)					
Authoritative		1.09	(0.89, 1.31)	-	-
Permissive/Supportive		0.97	(0.74, 1.23)	-	-
Neglectful		0.92	(0.72, 1.18)	-	-
Other		0.94	(0.52, 1.70)	-	-
Progressive Discipline (Ref: Sometimes)					
Always		-	-	1.05	(0.78, 1.41)

[a] 'Other' includes any students not in grade 9-12, Quebec students in secondaire I-II and students who are in classes with no official grade equivalent (i.e., "new immigrant' classes in Quebec).

Note: Current cannabis use was defined as using once a month in the last 12 months, up to everyday use.

Models controlled for student (grade, sex, ethnicity, binge drinking, smoking and student weekly spending money) and school-level (province, school-area median household income, urbanicity, and school enrolment) covariates and school clustering.

Model 1 includes school disciplinary approach categories (BIC= 27668.00)
Model 2 includes school-reported use of the progressive disciplinary approach, where sanctions get stronger with subsequent offences (BIC= 26825.81)
* = $p <.05$, ** = $p <.01$, *** = $p <.001$.

In Model 1, the school disciplinary approach categories were tested as predictors of current student cannabis use, adjusting for other student substance use (tobacco, binge drinking) and various sociodemographic variables (province, grade, sex, race/ethnicity, school-area median income, urbanicity, and enrolment) (See Table 3). Students classified in the "other" grade (e.g., Quebec Secondary I-II students) were less likely to report current cannabis use (OR 0.70, 95% CI [0.60, 0.681) than grade 9 students. Males were more likely than females to report current cannabis use (OR 1.48, 95% CI [1.39, 1.57]). Students that reported current binge drinking or tobacco smoking were more likely to report current cannabis use than students that did not report binge drinking (OR 3.34, 95% CI [3.12, 3.58]) and never smokers (OR 3.27, 95% CI [2.99 3.58]). Students with $100 or less a week to spend or save were less likely to report cannabis use than their peers with over $100 of weekly spending money. At the school-level, students attending schools in medium and large urban areas were more likely to report current cannabis use than students at schools in small urban areas (OR 1.51, 95% CI [1.15, 2.01], OR 1.44, 95% CI [1.14, 1.71]). No differences resulted for the other school covariates of school enrollment and median area household income. No significant associations resulted between the likelihood of student current cannabis use and the school disciplinary approach categories.

Similar results occurred in Model 2, examining the associations between attending schools that reported "always" using the progressive discipline approach and student cannabis

use. School reported "always" versus "sometimes" use of the progressive discipline approach was not significantly associated with student cannabis use.

Table 4 presents results for school disciplinary approach categories (Model 3) and school use of the progressive disciplinary approach (Model 4) predicting student perceptions of school supportiveness for the prevention and cessation of substance use, adjusting for other student substance use (tobacco, binge drinking) and various sociodemographic variables (province, grade, sex, race/ethnicity, school-area median income, urbanicity, and enrolment). Based on similar patterns across categories in the descriptive statistics above, a binary outcome of the student perceptions of school support variable was created by collapsing the very supportive and supportive responses and the very unsupportive and unsupportive responses.

Table 4. Logistic regression models predicting student perceptions of school support for the prevention and cessation of substance use by school disciplinary approach categories and the progressive discipline approach, adjusting for individual and school-level characteristics in Year 7 of the COMPASS Study (2018-2019).

		Model 3 N=53959		Model 4 N=52633	
		OR	95% CI	OR	95% CI
Student- Level Characteristics:					
Grade (ref: 9)	10	0.78	(0.74, 0.82)***	0.78	(0.74, 0.82)***
	11	0.75	(0.71, 0.77)***	0.74	(0.70, 0.78)***
	12	0.74	(0.70, 0.79)***	0.75	(0.70, 0.80)***
	Other [a]	0.75	(0.71, 0.79) ***	1.41	(1.31, 1.51)***
Sex (ref: female)	Male	1.25	(1.21, 1.30)***	1.25	(1.21, 1.30)***
Race/Ethnicity (ref: White)	Non-White/ Mixed	1.00	(0.96, 1.04)	1.01	(0.96, 1.05)
Binge Drinking (ref: Never)	Current	0.98	(0.94, 1,04)	1.00	(0.94, 1.05)
Smoking Status (Ref: Never)	Current	0.82	(0.75, 0.89)***	0.82	(0.75, 0.89)***
Weekly Spending Money (Ref: over $100)	$0	1.05	(0.99, 1.11)	1.05	(0.99, 1.11)
	$1-$20	1.19	(1.12, 1.25)***	1.19	(1.12, 1.25)***
	$21-$100	1.14	(1.09, 1.20)***	1.14	(1.09, 1.20)***
School- Level Characteristics:					
Urbanicity (ref: Small Urban)	Rural	0.99	(0.71, 1.39)	1.09	(0.75, 1.59)
	Medium Urban	1.07	(0.80, 1.41)	1.06	(0.79, 1.43)
	Large Urban	0.83	(0.69, 1.01)	0.89	(0.74, 1.08)
Enrolment (ref: 501-1000)	0-500	0.96	(0.82, 1.13)	0.97	(0.82, 1.15)
	1001-1500	1.51	(1.45, 1.58)	1.06	(0.81, 1.40)
School Area Median Household Income (ref: $50,000- $75,000)	$25,000-$50,000	1.42	(1.17, 1.81)**	1.33	(1.04, 1.70)*
	$75,000-$100,000	1.18	(0.95, 1.47)	0.94	(0.71, 1.24)
	$100,000+	0.96	(0.67, 1.37)	1.01	(0.67, 1.52)
School Disciplinary Approach Category (Ref: Authoritarian)					
Authoritative		0.83	(0.73, 1.06)	-	-
Permissive/Supportive		1.30	(1.01, 1.67)*	-	-
Neglectful		0.94	(0.74, 1.19)	-	-
Other		1.29	(0.77, 2.16)	-	-
Progressive Discipline (Ref: Sometimes)					
Always		-	-	0.94	(0.71, 1.24)

[a] 'Other' includes any students not in grade 9-12; Quebec students in secondaire I-II and students who are in class with no official grade equivalent (i.e., "new immigrant" classes in Quebec).

Note: Models predict student responses of supportive regarding their perceptions of school support for the prevention and cessation of substance use (ref: unsupportive).

Models controlled for student (grade, sex, race/ethnicity, binge drinking, smoking and student weekly spending money) and school-level (province, school-area median household income, urbanicity, and school enrolment) covariates and school clustering.

Model 1 includes school disciplinary approach categories (BIC= 70334.92)
Model 2 includes school-reported use of the progressive discipline approach (BIC=70334.92)

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

In Model 3, students in higher grades (10, 11, 12, and 'other') were less likely to report they felt supported by their school in the prevention and cessation of substance use than students in grade 9 (OR 0.78, 95% CI [0.74, 0.82], OR 0.75, 95% CI [0.71, 0.77], OR 0.74, 95% CI [070, 0.79], OR 0.75, 95% CI [0.71, 0.79], respectively). Males were more likely to report they felt supported by their school for the prevention and cessation of substance use than their female counterparts (OR 1.25, 95% CI [1.21, 1.30]). No significant associations resulted between binge drinking or race/ethnicity and perceptions of school supportiveness. Current smoking predicted lower likelihoods of reporting perceptions of school support in the prevention and cessation of substance use than never smoking (OR 0.82, 95% CI [0.75, 0.89]). Students who reported having $1-$20 and $21-$100 of weekly spending money were more likely to report they felt supported than students with over $100 of weekly spending money (OR 1.19, 95% CI [1.12, 1.25], OR 1.14, 95% CI [1.09, 1.20], respectively). Students attending schools classified as using a 'Permissive/Supportive' disciplinary approach were more likely to report they felt supported in the prevention and cessation of substance use than their peers at schools classified as 'Authoritarian' (OR 1.30, 95% CI [1.01, 1.67]).

In Model 4, student perceptions of school supportiveness did not differ based on school always or sometimes use of the progressive discipline approach.

Table 5 displays the results of the proposed mediation model. A simplified figure of this model is displayed above in figure 1.

Table 5. Standardized regression coefficient estimates and standard error of the α, β and indirect effect (αβ) on student-reported cannabis use by school disciplinary approach category via student perceptions of school support for the prevention and cessation of substance use in Year 7(2018-2019) of the COMPASS study.

Effect	Permissive/ Supportive		Authoritative		Neglectful		Other		Progressive Discipline	
	Est. (SE)	95% CL	Est. (SE)	95% CL	Est. (SE)	95% CL	Est. (SE)	95% CL	Est. (SE)	95% CL
X ➡ M1 (α)	0.26 (0.13)*	(0.01, 0.52)	-0.12 (0.09)	(-0.31, 0.06)	-0.06 (0.12)	(-0.30, 0.17)	0.25 (0.26)	(-0.26, 0.77)	-0.06 (0.14)	(-0.34, 0.22)
M1 ➡ Y1 (β)	-0.25 (0.03) ***	(-0.32, -0.19)	-0.25 (0.03) ***	(-0.32, -0.19)	-0.25 (0.03) ***	(-0.32, -0.19)	-0.25 (0.03) ***	(-0.32, -0.19)	-0.25 (0.03) ***	(-0.32, -0.19)
Indirect (αβ)	-0.06 (0.06)	(-0.20, 0.06)	0.03 (0.31)	(-0.03, 0.09)	0.02 (0.02)	(-0.02, 0.05)	-0.06 (0.06)	(-0.19, 0.06)	0.02 (0.02)	(-0.07, 0.05)
Direct (c')	-0.03 (0.14)	(-0.30, 0.23)	0.08 (0.09)	(-0.11, 0.27)	-0.08 (0.13)	(-0.33, 0.16)	-0.07 (0.30)	(-0.70, 0.53)	-0.06 (0.15)	(-0.24, 0.34)

Models used 'unsupportive' student perceptions for the prevention and cessation of substance use as a reference category, and 'non-current use' of cannabis as a reference. The 'authoritarian' category was treated as a reference category for the school disciplinary approaches variable.

Model 1: Tests the association between **current cannabis use (Y1)** and school disciplinary approach categories (X), via supportive (M1) student perceptions of support for the prevention and cessation of substance use.

All models controlled for student (grade, sex, ethnicity, binge drinking, smoking and student weekly spending money) and school-level (province, school-area median household income, urbanicity, and school enrolment) covariates and school clustering.

Note: Current cannabis use was defined as using once a month in the last 12 months, up to everyday use. Non-current cannabis use included students who reported not using cannabis in the past month, and never using cannabis.

The progressive discipline approach was tested in its own models, using 'sometimes/never' as a reference category.

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

No mediation was present between school disciplinary approach categories, student perceptions of support for the prevention and cessation of substance use, and student cannabis use. Students attending schools with Permissive/Supportive approaches had a higher likelihood of perceiving their school as supportive for the prevention and cessation of substance use (versus unsupportive) than their peers at schools with Authoritarian approaches (Est. 0.26, 95% CI [0.01, 0.52]), albeit the effect size was small. Students with perceptions of their school being "supportive" for the prevention and cessation of substance use were less likely to report current cannabis use, than their peers with perceptions of their school being unsupportive.

3.4 DISCUSSION

This study examined the relationships between school disciplinary approach styles and student-reported cannabis use and perceptions of school supportiveness for the prevention and cessation of substance use. Student-reported current cannabis use did not vary based on their school's disciplinary style classification or use of the progressive discipline approach, and only one school disciplinary category was associated with student perceptions of school supportiveness. Students more frequently perceived their school as supportive in the prevention and cessation of substance use if they attended schools classified as using a Permissive/Supportive disciplinary style in comparison to students at Authoritarian schools, albeit the effect size was small. Unlike findings in the previous year of the COMPASS study (22), use of the progressive disciplinary approach was not associated with student cannabis use; however, analysis was limited as the vast majority of schools indicated always using this

approach, and all schools at least sometimes used it. No mediation by student perceptions of school supportiveness was found, as expected based on the null findings between school disciplinary approach styles and student cannabis use. However, students who perceived their school as supportive for the prevention and cessation of substance use were less likely to report current cannabis use.

Using data from Canadian secondary schools that participated in the COMPASS Study (2017/2018), schools were classified into disciplinary approach styles based on their disciplinary responses for student first-offence violations of their school's cannabis policies. Most schools were classified as using Authoritative and Authoritarian approaches, with fewer schools using Neglectful, Permissive/Supportive, and Other styles. No difference was found in student cannabis use by school disciplinary styles. In comparison, other school disciplinary climate studies that have found significant associations with substance use have classified schools based on student-reported perceptions of school approaches (9) (48), as opposed to the school-reported measures of the disciplinary consequences and supports used to classify schools in the current study. There was also minimal association between school disciplinary style and student perceptions of school supportiveness for the prevention and cessation of substance use; thus, suggesting student perceptions of support might reflect other factors within their school, and not the disciplinary response styles used for student cannabis use. Students may also not be aware of the disciplinary responses utilized, unless they have been penalized. However, similar to previous work, student perceptions of school supportiveness were associated with lower risk of cannabis use. Overall, results suggest the actual disciplinary consequences and supports reported by schools have negligible effect on either student perceptions or cannabis use. Future longitudinal research is needed to confirm findings.

Contrary to expectations, student cannabis use and perceptions of school support did not differ at schools classified as using Authoritative or Neglectful disciplinary styles in comparison to Authoritarian schools. Most school climate research has indicated various benefits of the authoritative approach, such as, less truancy, fewer dropouts, better emotional, behavioural and cognitive engagement, and lower substance use (9) (45); whereas, authoritarian school climates are believed to increase substance use risk for students (9). Previous research examining the authoritarian school climate theory has suggested that students attending schools that they perceive as having a higher disciplinary structure and greater student support have better overall outcomes (9). Students are said to become more engaged when they are in a structured environment and feel encouraged and supported, and to engage in less delinquent behaviour (59). Baumrind's theory of parenting characterizes neglectful approaches as minimal effort, inconsistency, and often sporadic stricter disciplinary practices (45). It was hypothesized that minimal effort within school disciplinary styles may lead students to feel unsupported and be uneducated in substance use prevention.

The one style associated with student perceptions of school supportiveness in the prevention and cessation of substance use was the Permissive/Supportive disciplinary classification, in comparison the Authoritarian style. This result could be expected as Permissive/Supportive schools implement more first-offence disciplinary response options targeted towards supporting the student, such as referring a student to a counsellor or cessation program, as opposed to penalizing them. This category was based on Baumrind's theory of parenting which defines permissive parents as those that place little demand and avoid confrontive practices (44). Authoritative styles have generally considered favourable over permissive approaches, although the Ontario Progressive Discipline Policy also aligns well with

this disciplinary category. In Ontario, schools are advised to use a range of supportive responses and restrict more punitive consequences for subsequent or escalating offences. By using more supports than punitive discipline responses, schools classified as Permissive/Supportive may promote more positive outcomes for students, as students with perceptions of their school being supportive for the prevention and cessation of substance use were less likely to report current cannabis use. Results align with previous research suggesting that students who feel supported by their school experience a decreased risk of cannabis, alcohol and tobacco use (30) (67) (68) (69) (70). Creating a community in which students feel supported and a sense of belonging, may reduce the extent to which students are drawn to use cannabis as a way to meet social needs (76). However, no direct association between school disciplinary style and student cannabis use resulted. Further research into school characteristics promoting student perceptions of school supportiveness and how these influence their substance use is necessary.

Current cannabis use was highest among Alberta and Ontario students in the school year immediately post-legalization of cannabis in Canada. In Quebec, students reported the highest frequency of never using cannabis. Consistent with previous research, males were more likely to report current cannabis use, compared to their female counterparts, and current binge drinkers and smokers were more likely to report current cannabis use than students who have never used cannabis (77). The rates of poly-substance use are a concern, as students who report using cannabis and other substances, often experience worse health outcomes (20).

Given the lack of association between cannabis use and school disciplinary approaches, focusing on targeted cannabis prevention programs may prove more beneficial, by promoting resiliency and drug literacy to deter early-onset substance use. It is imperative to further investigate how schools can contribute to the prevention of early-onset cannabis use, as there is

evidence that delaying substance use can improve overall health outcomes, as well as prevent abnormal brain development (25). Furthermore, delaying onset of use may serve as a more realistic goal than abstinence for youth (78). Schools may encounter barriers in knowing which programs to refer students to, especially for students who violate cannabis policies for the first time. Future research should explore how schools decide on responses to student substance use policy violations. As cannabis has become more socially acceptable, school disciplinary approaches may have limited impact; students may not be motivated to change their usage, as they perceive cannabis use to be less harmful than other substances (24) (76). Reducing positive attitudes towards cannabis use may be plausible through programs that focus on correcting the misconceptions youth hold (79). Legalization of cannabis in Canada may allow schools to more openly discuss cannabis use with students, and provide them with the knowledge and skills to navigate cannabis use, in hopes to deter early-onset use (76).

3.5 LIMITATION AND STRENGTHS

The large sample size, including both student- and school-level data from four Canadian provinces, is a key strength of this study. While this large sample size supports generalizability, the COMPASS study was not designed to be provincially or nationally representative. The use of school administrator-reported measures creates the possibility of recall and social desirability biases. While these school administrator surveys were completed by the school contact(s) with the most knowledge about the school's health program and policy environment, respondents may have been unaware of how the policies and practices are being implemented. This may have affected the disciplinary options respondents selected on the survey, and therefore, their categorization into disciplinary approach styles. However, school correspondents are encouraged

to complete the survey with a group, if necessary, and COMPASS Study Knowledge Brokers follow-up with schools regarding any missing or unclear information. To gain insight into what schools actualize in practice, it would be of benefit to implement interviews with school administrators during data collections. Interviews would help gather information on how often specific first-offence disciplinary approaches are used and what is involved in the prevention and cessation programs being offered within each school, ultimately ensuring more accurate and detailed answers on the COMPASS School Programs and Policies (SPP) questionnaire. While COMPASS Knowledge Brokers are able to follow-up with schools at a later date, difficulties are often posed by trying to find time within the school administrators busy schedule.

The use of student-reported questionnaires also creates potential for social desirability and recall biases. In particular, students may underreport cannabis use, especially females, for whom use is more stigmatized (80). The COMPASS study uses active-information passive-consent protocols and does not require student names, which reduces selection bias and help preserve perceptions of confidentiality and anonymity among students (81) (82). Furthermore, while policies and practices contribute to school climate and social norms, students may be unaware of the disciplinary approach environment and supports present in their schools. Future research should explore perceptions of students who have been disciplined for cannabis use.

Interpretations are further limited by the use of cross-sectional data, which prevents the evaluation of the effectiveness of school disciplinary approach categories on cannabis use. We are unable to determine the directionality of the relationships tested. Future prospective research should examine how perceptions of school supportiveness vary in relation to cannabis use trajectories over secondary school, and whether changes in disciplinary response styles impact cannabis use and support perceptions over time. As this study focused solely on disciplinary

approach categories, prevention and cessation programs already in place at schools were not
assessed. Prevention programs have the potential to decrease student cannabis use within the
schools and should be considered in future research (83). Furthermore, this study investigated
cannabis use by current and non-current reported student use. Future research should investigate
the differences between a wider range of frequencies, to examine any further differences with
disciplinary approach styles.

3.6 CONCLUSION

This research is timely with the recent legalization of cannabis use in Canada and
increased attention to prevention efforts targeting youth. Student perceptions of support for the
prevention and cessation of substance use offer new insight into the school environment. As
school disciplinary approaches had no effect on student cannabis use, further research is
necessary to help schools make evidence-based policy and practice decisions regarding student
cannabis use. The lack of association may represent a missed opportunity to effectively deter
substance use, while avoiding potential unintended negative consequences (3). There is potential
for other school factors (e.g., social norms) to play a larger role in influencing cannabis use in
students (6) (8) (80). It was found that students felt more supported in schools classified as using
a Permissive/Supportive disciplinary response style in comparison to Authoritarian schools, and
students who felt supported were less likely to report cannabis use. However, student cannabis
use at Permissive/Supportive schools did not differ from Authoritarian schools. Student
perceptions of support for the prevention and cessation of substance use may be an important
additional factor for schools to consider when implementing prevention and cessation programs

for students. Assessing student perceptions of disciplinary approaches and their effectiveness in reducing early-onset cannabis use over time is warranted.

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5.0 APPENDIX

Supplementary Table 1. Missing Data Analysis; Logistic regression models predicting 'missing' student cannabis use by school disciplinary approach categories and the progressive discipline approach, adjusting for individual and school-level characteristics in Year 7 of the COMPASS Study (2018-2019).

		Model 1		Model 2	
		OR	95% CI	OR	95% CI
Student- level characteristics:					
Grade (ref: 9)	10	0.94	(0.75, 1.18)	0.96	(0.76, 1.21)
	11	1.17	(0.91, 1.50)	1.17	(0.91, 1.50)
	12	1.45	(1.08, 1.96)**	1.43	(1.06. 1.94)**
	Other [a]	0.92	(0.68, 1.27)	0.92	(0.67, 1.27)
Sex (ref: female)	Male	0.59	(0.50, 0.70)***	0.59	(0.49, 0.69)***
Race/Ethnicity (ref: White) [b]	Non-White/ Mixed	0.70	(0.58, 0.84)***	0.70	(0.68, 0.84)***
Binge Drinking (ref: Never use)	Current	0.88	(0.66, 1.17)	0.87	(0.65, 1.16)
Smoking Status (Ref: Never use)	Current	0.74	(0.55, 1.00)	0.74	(0.54, 1.01)
Weekly Spending Money (Ref: over $100)	$0	1.55	(1.19, 2.03)**	1.60	(1.22, 2.10)**
	$1-$20	1.40	(1.10, 1.78)**	1.41	(1.12, 1.81)**
	$21-$100	1.16	(0.92, 1.46)	1.15	(0.91, 1.45)
School- Level Characteristics:					
Urbanicity (ref: Small Urban)	Rural	1.12	(0.63, 2.00)	1.29	(0.70, 2.37)
	Medium Urban	1.11	(0.76, 1.62)	1.06	(0.74, 1.53)
	Large Urban	1.08	(0.84, 1.39)	1.04	(0.82, 1.31)
Enrolment (ref: 501-1000)	0-500	1.15	(0.90, 1.46)	1.14	(0.91, 1.44)
	1001-1500	0.75	(0.56, 0.99)*	0.77	(0.59, 0.99)*
School Area Medium Household Income (ref: $50,000-$75,000)	$25,000-$50,000	0.91	(0.68, 1.23)	0.91	(0.69, 1.20)
	$75,000-$100,000	0.99	(0.74, 1.23)	1.00	(0.77, 1.30)
	$100,000+	0.62	(0.40, 0.95)*	0.48	(0.31, 0.74)**
School Disciplinary Approach Category (Ref: Authoritarian)					
Authoritative		1.10	(0.86, 1.40)	-	-
Permissive/Supportive		1.14	(0.81, 1.60)	-	-
Neglectful		1.16	(0.84, 1.60)	-	-
Other		1.85	(0.44, 7.82)	-	-
Progressive Discipline (Ref: Sometimes)					
Always		-	-	1.21	(0.87, 1.67)

[a] 'Other' includes any students not in grade 9-12, Quebec students in secondaire I-II and students who are in class with no official grade equivalent (i.e., "new immigrant' classes in Quebec).

b 'Race/ethnicity' includes: White, Black, Asian, Indigenous [First Nations, Métis, or Inuit], Latin American or Hispanic, and Mixed/Other.

Note: Current cannabis use was defined as using once a month in the last 12 months, up to everyday use.

Models controlled for student (grade, sex, ethnicity, binge drinking, smoking and student weekly spending money) and school-level (province, school-area median household income, urbanicity, and school enrolment) covariates and school clustering.

Model 1 includes disciplinary approach categories.
Model 2 includes school-reported progressive discipline.
* = $p <.05$, ** = $p <.01$, *** = $p <.001$.

Supplementary Table 2. Missing Data Analysis; Logistic regression models predicting 'missing' data for perceptions of support for the prevention and cessation of substance use by school disciplinary approach categories and the progressive discipline approach, adjusting for individual and school-level characteristics in Year 7 of the COMPASS Study (2018-2019).

		Model 1		Model 2	
		OR	95% CI	OR	95% CI
Student- level characteristics:					
Grade (ref: 9)	10	1.16	(1.04, 1.28) **	1.16	(1.05, 1.29) **
	11	1.42	(1.27, 1.59) ***	1.41	(1.26, 1.58) ***
	12	1.37	(1.21, 1.56) ***	1.38	(1.21, 1.58) ***
	Other [a]	0.54	(0.47, 0.62) ***	0.54	(0.47, 0.62) ***
Sex (ref: female)	Male	0.70	(0.65, 0.75) ***	0.69	(0.64, 0.74) ***
Race/Ethnicity (ref: White) [b]	Non-White/ Mixed	0.73	(0.68, 0.80) ***	0.73	(0.67, 0.79) ***
Binge Drinking (ref: Never use)	Current	0.88	(0.78,0.98) *	0.88	(0.78, 0.92) *
Smoking Status (Ref: Never use)	Current	0.82	(0.71, 0.95) *	0.82	(0.70, 0.94) **
Weekly Spending (Ref: over $100	$0	0.91	(0.81, 1.02)	0.90	(0.80, 1.01)
	$1-$20	0.91	(0.82, 1.01)	0.91	(0.82, 1.02)
	$21-$100	0.98	(0.88, 1.09)	0.98	(0.87, 1.09)
School- Level Characteristics:					
Urbanicity (ref: Small Urban)	Rural	1.29	(0.91, 1.82)	1.27	(0.87, 1.83)
	Medium Urban	0.98	(0.76, 1.26)	1.00	(0.78, 1.28)
	Large Urban	0.88	(0.74, 1.04)	0.88	(0.75, 1.04)
Enrolment (ref: 501-1000)	0-500	0.93	(0.80, 1.08)	0.93	(0.81, 1.08)
	1001-1500	0.89	(0.71, 1.12)	0.90	(0.72, 1.12)
School Area Medium Household Income (ref: $50,000- $75,000)	$25,000-$50,000	1.02	(0.83, 1.26)	1.00	(0.81, 1.22)
	$75,000-$100,000	0.92	(0.76, 1.12)	0.90	(0.75, 1.08)
	$100,000+	0.70	(0.52, 0.96)*	0.59	(0.42, 0.82)**

School Disciplinary Approach Category (Ref: Authoritarian)				
Authoritative	0.90	(0.77, 1.07)	-	-
Permissive/Supportive	0.85	(0.68, 1.07)	-	-
Neglectful	1.06	(0.85, 1.31)	-	-
Other	1.08	(0.62, 1.87)	-	-
Progressive Discipline (Ref: Sometimes)				
Always	-	-	0.95	(0.75, 1.21)

[a] 'Other' includes any students not in grade 9-12, Quebec students in secondaire I-II and students who are in class with no official grade equivalent (i.e., "new immigrant' classes in Quebec).
[b] 'Race/ethnicity' includes: White, Black, Asian, Indigenous [First Nations, Métis, or Inuit], Latin American or Hispanic, and Mixed/Other.

Models controlled for student (grade, sex, ethnicity, binge drinking, smoking and student weekly spending money) and school-level (province, school-area median household income, urbanicity, and school enrolment) covariates and school clustering.

Model 1 includes disciplinary approach categories.
Model 2 includes school-reported progressive discipline.

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