A Systematic Review of the Prevalence of Cyberbullying in Canada

by

Tanya Bilsbury

Submitted in partial fulfilment of the requirements

for the degree of Master of Science

at

Dalhousie University

Halifax, Nova Scotia

May 2015

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

This systematic review of research on the self-reported prevalence of cyberbullying (victimization and perpetration) in Canadian children and youth includes 45 studies from structured English and French searches of 8 scholarly databases plus Google Scholar and Web. Two researchers performed full-text reviews of English-language studies to abstract data and assess eligibility and risk of bias. Summary prevalence estimates were avoided on account of heterogeneity in included studies, regional variation in prevalence, and ageing or biased data. Prevalence estimates are increased by well-elaborated definitions and multiple-item measures, and inflated by the use of non-representative samples, conflation of bullying with aggression, and long reference periods. Findings suggest that cyberbullying is less prevalent than all forms of offline bullying and occurs frequently in few youth. Sex differences are small, but point to higher female victimization. Prevalence seems to increase with age, peaking around grade 9 before stabilizing or decreasing in high school.

LIST OF ABBREVIATIONS AND SYMBOLS USED

d: Cohen's *d*, a measure of effect size

δ or Δ: Delta, a measure of effect size

f: A statistical test used with analysis of variance; tests the hypothesis that the means of a set of homoscedastic normally-distributed populations are equal

n: The sample size of a group

η^2: Eta-squared, a measure of effect size used with analysis of variance

p: The p-value

$\hat{p}$: An observed proportion; e.g. $\hat{p}_F - \hat{p}_M$ indicates the difference in proportions (e.g., of victims) between females and males

ϕ^2: Phi-squared, a measure of effect size

r: Pearson's correlation coefficient

r^2: The coefficient of determination; indicates the percentage of variance in the dependent variable that can be attributed to the independent variable.

r_{ranks}: A non-parametric version of the correlation coefficient

s: The standard deviation of a distribution

μ: The mean of a distribution

V: Cramér's *V*, a measure of association between two categorical variables

χ^2: Chi-square, a measure of the strength of an association between categorical variables; followed by the degrees of freedom (in parentheses)

CDC: The Centers for Disease Control and Prevention (USA)

CPHA: Canadian Public Health Agency

EBQ: Electronic Bullying Questionnaire

Grey literature: That which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers[1]

PREVNet: Promoting Relationships and Preventing Violence Network, a network of Canadian researchers and organizations committed to preventing bullying

SSS: Safe School Survey

WHO – HSBC: World Health Organization – Health Behaviours in School - Aged Children

ACKNOWLEDGEMENTS

I am grateful for the long-time support of my co-supervisor Dr. John LeBlanc, who has provided me with many opportunities over the past 6 years through his research in bullying prevention and social and emotional learning. His position as a member of the working group of the Nova Scotia Task Force on Bullying and Cyberbullying provided the original purpose for this project. I was honored, as a student, to be able to contribute to the work of this group of experts and community leaders, which has led to meaningful social change in Nova Scotia.

I appreciate the support of my co-supervisor Dr. Gordon Flowerdew in bringing this project to fruition. This project has benefitted from the keen eye of my committee member Dr. Kathleen MacPherson, and Dr. Jill Hayden's instruction and guidance on systematic review methodology was indispensable.

I thank Ms. Ashley Chisholm and Dr. Brad Frankland for their diligent work as second reviewers for the assessment of study eligibility, risk of bias, and data abstraction. I also thank Mr. William Matheson for lightening my burden through his help with various tasks, and Ms. Robin Parker for her assistance in designing the literature search strategy.

I have been inspired by the work of Dr. Tracy Vaillancourt, which sets a high standard for quality and rigour in the social sciences, and have benefitted from her insightful feedback as external reviewer. I also thank those researchers who shared their data for inclusion in this review or corresponded with me about their studies.

I am obliged to my parents Dr. Christopher and Ms. Helena Bilsbury for their enduring support for and encouragement of my academic pursuits.

CHAPTER 1: INTRODUCTION

Cyberbullying refers to the occurrence of bullying through communication technology such as computers or phones[2]. The issue came to national prominence in early 2011, after the suicides of three cyberbullied teenage girls in Nova Scotia: Emily MacNamara[3] (aged 14), Jenna Bowers-Bryanton[4] (aged 15), and Courtney Brown[5] (aged 17). In response, provincial education minister Ramona Jennex commissioned a task force to determine the prevalence of cyberbullying among school-aged children and youth, and recommend policy changes and legislation to address the issue[6].

The task force report led to the adoption of the *Promotion of Respectful and Responsible Relationships Act* (2012)[7], which amended the preamble of the Nova Scotia *Education Act* to recognize cyberbullying. In April 2013, the provincial legislature ratified the *Cyber-Safety Act*[8], which established cyberbullying as a tort. This allows victims to sue perpetrators (or their parents) in civil court. The act allows courts to grant a protection order, the violation of which could result in a $5000 fine or 6 months imprisonment. Additionally, the province invested $800,000 per year[9] to establish the *CyberSCAN Investigative Unit*, a 5-person team dedicated to assisting victims, investigating complaints, and resolving cyberbullying situations through both informal and legal means[10].

International attention turned to the suicides of Amanda Todd (aged 15) of British Columbia in October 2012[11] and Rehtaeh Parsons (aged 17) of Nova Scotia in April 2013[12]. Both young women had spiralled into depression, self-harm, and substance use after intimate photographs were circulated at school and in the community. These cases led to further public outrage and demand for school-level interventions and national legislation[13,14]. In November 2013, during anti-bullying week, the federal government

proposed Bill C-13, the *'Protecting Canadians from Online Crime'* act[15], which would make the distribution of intimate images without the consent of the subject illegal and punishable by up to five years in prison (given that the images were taken at a time and place when the subject had the expectation of privacy). The proposed bill was highly controversial; critics argued that the anti-cyberbullying component was embedded in an omnibus bill that would increase the surveillance powers of the government and erode civil liberties[16]. Nevertheless, the bill received Royal Assent in December 2014 and became law in March 2015[17].

Any reliable understanding of the extent of the problem is missing from the debate. Whether based on Canadian or international data, or even on speculation, reports have alternately claimed that cyberbullying is decreasing[18], increasing[19], rare[20], rampant[21], an exaggerated issue[22], and a national epidemic[23]. The Nova Scotia Cyberbullying Task Force noted: "Statistics on bullying incidents are highly inconsistent and experts speculate that this may be attributed to many causes. Wide variation in perceptions and definitions of the term 'bullying' is likely to be a key factor"[24] (p.11). An understanding of the scope of the problem, both in terms of prevalence and frequency, will inform the need for and urgency of intervention and legislation. The best first step is a formal systematic review of research on the prevalence of cyberbullying in school-aged Canadians.

Why is Cyberbullying a Public Health Issue?

Cross-sectional studies show a relationship between cyber-victimization and depressive symptoms, anxiety, hostility, interpersonal sensitivity, low self-esteem, suicidal ideation, and suicide attempts[25–29]. For example, a study of grade 9 to 12 students in New York[29] found clinically-significant symptoms of depression in 48% and 44% of frequently

cyber-bullied males and females, respectively, compared to 5% of male and 13% of female non-victims[29]; for females, even infrequent cyber-victimization was associated with depression and serious suicidal ideation. Another cross-sectional survey[30] of almost two thousand US middle school students found that victims of cyberbullying were 1.9 times more likely to have attempted suicide than students who were not. A six-month longitudinal study[31] reported that cyber-victimization at the start of follow-up predicted a subsequent increase in depressive symptoms and problematic internet use in adolescents. A one-year longitudinal study[32] found that cyber-victimization led to reduced quality of life and increased use of hard drugs.

In cross-sectional studies, the perpetration of cyberbullying is associated with a poorer caregiver-child relationship, lower parental monitoring, lower emotional closeness between parent and child, higher physical or sexual victimization by an adult, substance use, delinquency, depressive symptomatology, being a victim of traditional bullying, and receiving a failing grade at school[33]. One-year longitudinal studies[32,34,35] have found that cyberbullying predicts externalizing problems, delinquency, and substance use.

Existing Prevalence Research

A 2010 literature review of international research[36] reports youth victimization rates ranging from 9% to 49% and youth perpetration rates ranging from 11% to 21%. The authors noted that the research area does not have a generally-accepted operational definition or standard of measurement for cyberbullying, therefore "results from...studies are very difficult to compare so as to have a clear picture of the exact extent of cyberbullying" (p. 86). Nevertheless, they concluded that "there is something that cannot really be questioned, that is that cyberbullying is a real and existing phenomenon which is

rather widespread among young people" (p. 86).

A 2009 review[37] and 'meta-synthesis' of research on cyberbullying victimization based on 25 peer-reviewed papers from the United States, Canada, Britain, Turkey, and the Netherlands reported that "On average, approximately 20 - 40% of youths report being victimized by a cyberbully" (p. 279) "at least once in their lives" (p. 277); see Figure 1 (p. 5). This 'average range' combines data representing lifetime prevalence with shorter durations (e.g., past semester). Only 11 of the 25 studies included in the narrative review provided rates fitting this range. The other 14 studies yielded estimates that fell below 20% (to as low as 3%) or above 40% (to as high as 72%), and it is not clear why these values were not included in the summary range. The author explained the exclusion of only two values from the summary range (6.5% and 72%), but the reasons why these estimates were excluded (measurement of electronic aggression, criteria of repetition not specified, restriction to internet sources) easily apply to other studies that were nevertheless included in the summary range.

Furthermore, some of the values that fit neatly within the prescribed range (Li, 2006[38] & 2007a[39], and Li, 2007b[40] & 2008[41]) represent republished data, despite the assurance that "some studies, which use secondary data reported on multiple occasions, were excluded from the synthesis" (p. 279).

Figure 1. Tokunaga's (2009) 'meta-synthesis' of cyber-victimization rates

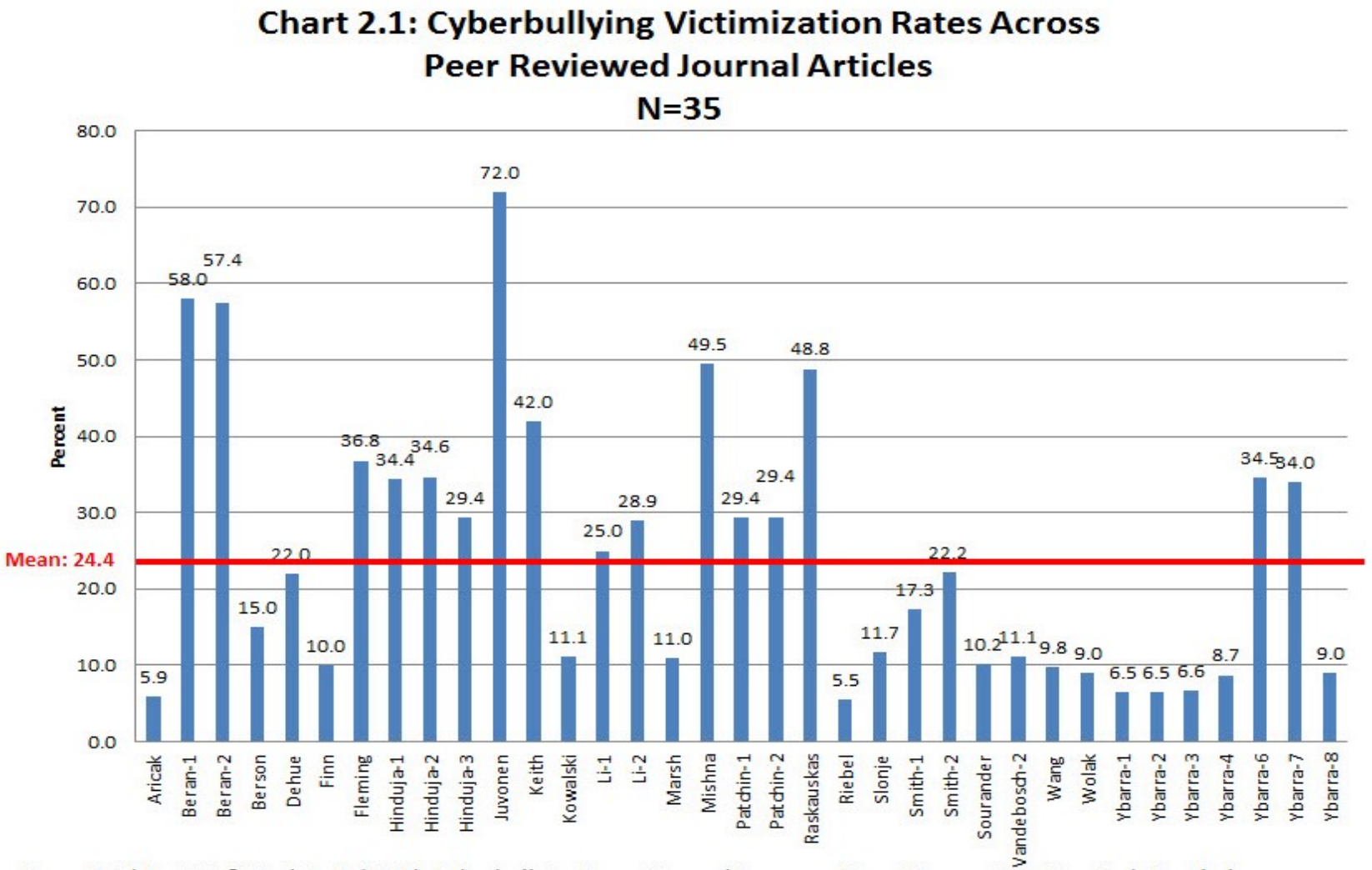
Annotated findings from literature on cyberbully victimization.

Study	*N*	Sample type	% Male	% Victim	Age	Gender
Aricak et al. (2008)	269	Sixth to tenth graders (school sample)	49.8	36.1	–	–
Beran and Li (2007)	432	Seventh to ninth graders (school sample)	44.7	57.4	*ns*	*ns*
Dehue et al. (2008)	1211	Primary and secondary school (school sample)	50.5	22.0[c]	*sig*	*sig*
Didden et al. (2009)	114	12–19 year olds (school sample)	72.0	5–12	*ns*	*ns*
Hinduja and Patchin (2008)	1378	Under 18 years (online sample)	49.3	≈35.0	*sig*	*ns*
Juvoven and Gross (2008)	1444	12–17 year olds (online sample)	–	72.0	*ns*	*ns*
Katzer et al. (2009)	1700	Fifth to eleventh graders (school sample)	44.7	–	*ns*	*ns*
Kowalski and Limber (2007)	3767	Sixth to eighth graders (school sample)	49.2	11.0	*sig*	*sig*
Li (2006)	264	Seventh-ninth graders (school sample)	48.5	≈25.0	–	*ns*
Li (2007a)	461	Seventh graders and HS students (school sample)	51.4	28.9	–	*ns*
Li (2007b)	177	Seventh graders (school sample)	49.2	24.9	–	–
Li (2008)	359	Seventh graders (school sample)	49.6	25.0[a] 33.0[b]	–	–
Patchin and Hinduja (2006)	577	9–17 year olds (online sample)	19.9	29.4	*ns*	*ns*
Sharples, Graber, Harrison, and Logan (2009)	2611	Eighth to tenth graders (school sample)	NA	15.5	–	–
Slonje and Smith (2007)	360	12–20 year olds (school sample)	56.4	17.6[a] 3.3[b]	*sig*	*ns*
Smith et al. (2008)	92[a]	11–16 year olds (school sample)	46.7[a]	22.2[a]	*ns*[a]	*sig*[a]
	528[b]		49.4[b]	58.1[b]	*ns*[b]	*ns*[b]
Topcu et al. (2008)	183	14–15 year olds (school sample)	55.7	20.9	–	*ns*
Varjas et al. (2009)	437	Sixth to eighth graders (school sample)	50.1	–	*ns*	*ns*
Williams and Guerra (2007)	3339	Fifth to eleventh graders (school sample)	–	9.4[c]	*sig*	*ns*
Wolak et al. (2007)	1500	10–17 year olds (online sample)	–	9.0[c]	*ns*	*ns*
Ybarra (2004)[d]	1501	10–17 year olds (telephone)	–	6.5[c]	*ns*	*ns*
Ybarra and Mitchell (2004)[d]	1501	10–17 year olds (telephone)	55.0	6.5[c]	–	–
Ybarra and Mitchell (2008)	1588	10–15 year olds (online sample)	52.2	34.0[c]	*sig*	*sig*
Ybarra et al. (2006)[d]	1500	10–17 year olds (telephone)	49.3	11.1	*sig*	*ns*
Ybarra et al. (2007)	1515	10–15 year olds (online sample)	–	–	*sig*	*sig*

Source: Tokunaga (2009)[37]

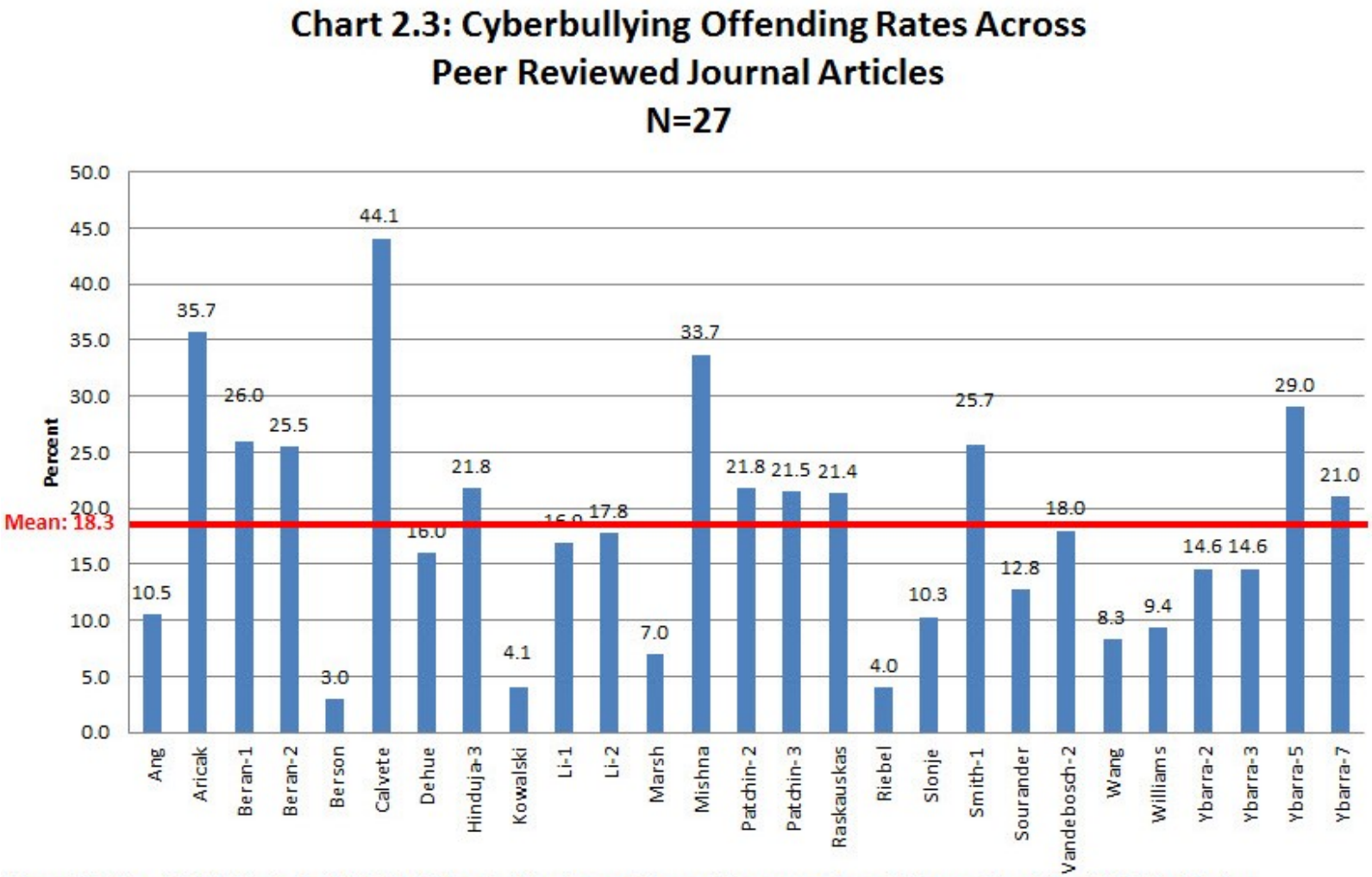
Prominent US cyberbullying researchers Justin Patchin and Sameer Hinduja report[42] that prevalence rates range from 5.5% to 72.0% for victimization (based on 35 peer-reviewed journal articles) and from 3.0% to 44.1% for perpetration (based on 27 peer-reviewed journal articles). Patchin and Hinduja[42] calculated that 24.4% of youth are victims of cyberbullying (see Figure 2, p. 6) and 18.3% are perpetrators (see Figure 3, p. 7).

Figure 2. Patchin & Hinduja's (2012) mean prevalence estimate for cyber-victimization



From: Patchin, J. W. & Hinduja, S. (2012). Cyberbullying Prevention and Response: Expert Perspectives. New York: Routledge.

Figure 3. Patchin & Hinduja's (2012) mean prevalence estimate for cyberbullying perpetration



From: Patchin, J. W. & Hinduja, S. (2012). Cyberbullying Prevention and Response: Expert Perspectives. New York: Routledge.

Patchin and Hinduja's claim[42] that 24% of youth are victims and 18% are perpetrators of cyberbullying is based on the arithmetic mean of the prevalence rates from published and peer-reviewed studies that were available to the authors at the time, as demonstrated by the red lines through Figure 2 (p. 6) and Figure 3 (p. 7). However, it is hard to justify taking the mean of these proportions; it combines studies with incommensurable methodologies, such as different exposure periods (e.g., past three months, past year, or the entire lifetime) and different definitions of 'cyberbullying'. For example, the lowest victimization rate, 5.5%, describes those German pupils who were cyber-victimized at least once a week in the past two months[43], whereas the highest victimization rate, 72.0%, represents the percentage of a largely female sample of US adolescents recruited from a social networking website who ever experienced 'mean things' online in their lifetime, defined as "anything that someone does that upsets or offends someone"[44] (p. 499).

Other inconsistencies appear as well. The prevalence values of 11.1% victimization and 4.1% perpetration taken from Kowalski[45] only represent the proportions of *exclusive* victims and bullies in that sample; yet, the values of 10.2% victimization and 12.8% perpetration reported for Sourander[46] each include the 5.6% of students who were bully-victims[i] in that sample.

It warrants mention that 7 of the 35 victimization values[25,33,39,47–50] and 7 of the 27 perpetration values[25,33,39,47–49,51] included in Patchin and Hinduja's[42] averages are duplicates, because they are based on the same samples as papers already included in the review. Additionally, the review propagates misreported data from Aricak et al.[52], which

[i] 'Bully-victims' are students who report both being bullied as well as bullying others.

underlines the importance of checking reported values in source documents. Aricak and colleagues[52] reported a victimization rate of 5.9% and a perpetration rate of 35.7% from a sample with 50% males and 50% females; 5.9% is the sum of the 3.3% of boys who were victims with the 2.6% of girls who were victims, and 37.5% is the sum of the 19.0% of boys who were perpetrators and the 16.7% of girls who were perpetrators. The appropriate approach to combining prevalence rates from each gender is to take the weighted average of the prevalence rates. In this sample of 50% males and 50% females, the overall prevalence of victimization in the total sample should be 3.0% victimization and 17.9% perpetration, about half the size of the reported values. Finally, the value of 10.5% perpetration reported by Patchin and Hindjua[42] for Ang et al.[53] is not found in the source document; the correct value is 18.9%.

Potential Sources of Variation in Prevalence Rates

Definition & measurement. Bullying is a specific type of aggression[54] that often occurs without justifiable provocation[55]. Direct bullying consists of physical or verbal attacks, but bullying also takes more indirect relational forms, such as exclusion and rumour spreading[56]. Dan Olweus, the pioneering researcher of the field, states that: "A person is bullied when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other persons, and he or she has difficulty defending him or herself"[57]. Olweus places great stress on the point that bullying involves a power differential:

> It must be stressed that the term bullying is not (or should not be) used when two students of approximately the same strength (physical or psychological) are fighting or quarrelling. In order to use the term bullying, there should be an *imbalance in strength* (an asymmetric power relationship): The student who is exposed to the negative actions has difficulty defending him/herself and is somewhat helpless

against the student or students who harass[56] (p. 10).

The construct of 'bullying' is specified from other forms of aggression by three key criteria: negative intent, repetition, and power imbalance[56]. These concepts are also reflected in the lay understanding of the term: Merriam-Webster's English dictionary describes a bully as "a blustering browbeating person; *especially*: one habitually cruel to others who are weaker"[58]. Indeed, the 17th century[59] concept of the 'bully' as a ruffian who harasses the weak pre-dates Olweus' formulation.

Olweus' three criteria serve to set bullying apart from other forms of aggression as a *relationship* based on intimidation. This may contribute to its unique psychological harms; longitudinal research shows that bullied children are at increased risk of depression[60], psychiatric treatment[61], and suicidal ideation[62] when they become adolescents and adults.

The term 'cyberbullying' was popularized by Canadian school teacher and awareness advocate Bill Belsey in 2004[40,63], although the subject was previously acknowledged under labels such as 'internet bullying'[64]. Belsey's concise definition of cyberbullying as "the use of information and communication technologies to support deliberate, repeated, and hostile behaviour by an individual or group, that is intended to harm others"[63] gained wide currency in academic literature[39,40,65–67] in spite of its omission of the power differential criterion. There are more recent academic definitions that map on to the canonical construct of bullying, for example, Smith's (2008) suggestion of "An aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him or herself" [68](p. 367). However, there is no single widely-accepted definition of the construct, and the

research area continues to be plagued with definitional issues[37,42].

Youths' own understanding of what constitutes 'bullying' relies heavily on negative actions (e.g., being mean). While bullying undoubtedly represents a negative relationship, negative actions are not[69] specific to bullying, because they may represent other forms of aggression, offense given unintentionally, or friendly teasing. In 2008, Vaillancourt et al.[69] asked 1,767 Canadian grade 3 to 12 students to articulate their own definition of bullying. While 92% mentioned some kind of negative behaviour, 26% specified a power imbalance, only 6% included repetition, and less than 2% specified intent. Bieber[70] observed that an accurate understanding of the concept increases with age, and is associated with lower self-reported victimization ($r = 0.25$).

Participants' responses may also depend on the provision of examples (i.e. recall cues). These include: 1) naming the sources of or instruments used for cyberbullying, such as e-mail, instant messaging, cell phones, and online social networks, and 2) naming the specific behaviours that constitute cyberbullying, such as forwarding a private picture, making threats, and name-calling. Extensive research has shown that such prompts improve memory recall[71]. Restricting the number of cues should result in a lower estimate of prevalence; for example, the question 'Have you been bullied on the internet?' should yield a lower prevalence estimate than one that also includes cyberbullying occurring via phones, e.g. text messages and voicemail.

Exposure duration. Prevalence may be assessed over different time periods; for example, during the last week, month, year, or 'ever' (in the respondent's lifetime). From a definitional perspective, period prevalence rates *must* increase with period duration; more people should report having been victimized over their lifetime than in the last month

(assuming incidence is more than zero). However, this effect could be confounded by recall problems, such as the tendency to forget distant events[71].

Sample issues. ***Non-representative samples.*** Sampling is another important source of variance in prevalence rates. Studies based on convenience samples, such as visitors to the *Kids Help Phone* website, likely produce inflated prevalence rates because the troubled youth who seek counselling services have more experience with school problems such as cyberbullying. This consideration also applies to all online convenience samples, since higher internet use is associated with more involvement in cyberbullying[72]

It should not be assumed that prevalence research from peer-reviewed journals is automatically better quality than 'grey literature' research that is disseminated via other avenues[ii]; indeed, any research should be evaluated on its own merits. An exclusive focus on material sourced from academic journals is a critical limitation of existing reviews of cyberbullying prevalence. Compared to lengthy papers such as theses or reports to organizations such as school boards, journal articles often omit important methodological details on account of constrained word counts.

Academic researchers face many barriers to recruiting participants. They must first attain permission from school boards before approaching individual school principals. They must then secure signed consent forms from not only individual students but also their parents. Finally, they rely on students to show up to testing sessions that may be booked outside of class time. Such surveys can report response rates as low as 20%[73,74]. Studies with very low response rates may reflect volunteer bias[75], which would increase

[ii] 'Grey literature' is defined as "That which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers."[1]

prevalence rates if only those with salient personal experience in cyberbullying are sufficiently motivated to participate.

Generally speaking, volunteers may not be representative of the entire population that they form a part of. More representative samples can be provided by large-scale surveys mandated by school boards, or by large organizations such as Statistics Canada, which measured online victimization in the 2009 cycle of the *General Social Survey*[76]. Graduate students who conduct research for school boards for a thesis project may also benefit from high response rates, as could organizations that collaborate with school boards (e.g., the McCreary Centre or the World Health Organization).

Sex. It is a common view that females are more likely to be victims of cyberbullying; indeed, presenters from the Nova Scotia Advisory Council on the Status of Women to the Bullying and Cyberbullying Task Force were quite certain that girls are more often victims, and suggested that any evidence to the contrary is attributable to under-reporting (personal communication, 18 August 2011). Literature reviews based on international research have noted that gender effects are inconsistent and small[37,42] but as previously discussed, these reviews do not take methodological differences between studies into account. One widely-cited Canadian cyberbullying study[40] reports that a majority (60%) of victims are female; however, the sample contained more females than males, and a chi-square test comparing the proportion of female to male victims actually shows no significant difference. The existence of such widely-propagated errors in the field of cyberbullying research indicates that a well-done systematic review should, whenever possible, check the accuracy of reported differences.

Grade/Age. Prevalence differences by grade level can be expected based on

increasing exposure to technology in older youth[72,77], but this is a matter that must be extricated from the measurement of lifetime prevalence rates (simply because 'ever', is a longer time for older subjects) and from the oft-asked question of whether prevalence is increasing over time. Grade effects can be measured in a number of ways; for example, by comparing prevalence (measured over a short period such as the last month) in subjects from different grades (i.e., in cross-section), following the same youth as they age (i.e., cohort effect), and measuring prevalence in the same grade level over different years (i.e., secular trends). A further complication in evaluating age effects on prevalence arises from older students' improved ability to delineate bullying from general aggression, which has a minimizing effect on prevalence rates[70].

Objectives

The objective of this study is to conduct a formal systematic review of Canadian studies assessing the prevalence of cyberbullying (victimization and perpetration) among youth. Prevalence estimates will be considered in the context of methodological issues and subject factors.

This will create the best starting point for investigations into the scope and nature of cyberbullying as a public health issue affecting Canadian youth; it will also inform the need for interventions and point to methodological issues in the research field.

Participants: School-aged Canadians (≤ 19 years old)

Intervention: Not applicable to prevalence research

Comparison: Not applicable to prevalence research

Outcome: The percentage of youth in the total sample who are victims or perpetrators of cyberbullying according to a self-report survey. Heterogeneity in the

outcome is expected given that there is no well-accepted standard definition or measurement for cyberbullying.

Secondary outcomes: Reports of the frequency of cyberbullying, the prevalence of offline bullying, and the prevalence of cyberbullying by age/grade and sex.

CHAPTER 2: METHOD

Literature Search Method

Canadian cyberbullying studies were identified through a structured search. The Boolean search string was developed in consultation with a systematic reviews librarian from the Dalhousie University Health Sciences library. The main concepts for the search were bullying, the electronic medium, and the geographic location of Canada. A concept map (Table 1, Appendix A, p. 142) was used to design the search strings (Appendix B, p. 144) by inclusively combining synonyms for each concept using 'OR' (e.g., 'electronic harassment is a synonym for cyberbullying) and exclusively combining these across the main search concepts using 'AND'. The concept map was also translated into French, producing French search strings (Table 2, Appendix A, p. 142). On account of the length and complexity of the search strategy, it was broken into two separate search strings for each language to be used in each database.

I ran the Boolean strings in the following databases: the Canadian Electronic Library, CINAHL, PAIS International, ProQuest Dissertations & Theses, PsycINFO, PubMed, Social Services Abstracts, and the Web of Science. These databases were suggested by the Dalhousie Libraries subject guides for health sciences[78] and social sciences[79] research; see Appendix C (p. 148) for database descriptions. Further searches for grey literature used the thesis collection of Library and Archives Canada and the search engines of Google Scholar and Google Web. Due to resource limitations, the Google Web search was restricted to Canadian sources and the first 250 results (25 pages).

I considered using the CADTH Grey Matters[80] checklist to ensure the

comprehensiveness of the search for grey literature; however, the tool is heavily geared toward pharmacological research, and does not suggest relevant Canadian sources (e.g., Statistics Canada) that were not already indexed by at least one of the 9 scholarly databases.

Table 3 (p. 18) enumerates the results from searches in individual databases. In some cases, the search strategy had to be modified for the database. The Canadian Electronic Library produced over 13,500 English results and 8,000 French results for the first variant of the search string; these were reduced to 12 and 4, respectively, by selecting the suggested subject term 'cyberbullying' in the English search, and 'intimidation sur internet' in the French version of the search. ProQuest Dissertations & Theses produced over 300,000 English results and 100,000 French results; many of the results were not relevant to cyberbullying, but only appeared because the words 'online' or 'electronic' occurred along with terms like 'aggression' or 'harassment' somewhere in the full-text, but without relation to each other.

The results were reduced to 201 English theses and 38 French theses by restricting the search to 'anywhere except full text' (e.g., the title or abstract). Although PubMed automatically used the MeSH term 'bullying', the preponderance of results described animal research (for example, animal aggression and electronic tagging). The results were therefore restricted to studies on human subjects.

The search was much more difficult to execute in the search engines compared to the databases. Initial results (over 2 million in Google Web) indicated that Google did not correctly parse the search strings, likely due to their length and complexity. Clicking the 'advanced search' option in Google Scholar showed clear errors, and indicated that

Boolean search form used by Google was not equipped to handle more than a couple of 'AND' or 'OR' combinations. Accordingly, the search was simplified to (cyberbullying OR "electronic bullying" AND Canada) in English and (cyberintimidation AND Canada) in French. Due to resource limitations, only the first 250 of over 4,000 results for the English-language search in Google scholar were examined, and the Web searches were restricted to Canadian pages.

Table 3. Detailed results from database searches

Database/Strategy	English A	English B	French A	French B
Canadian Electronic Library *No wildcards*	13,552 results Focussed search to 'cyberbullying' (subject term)= 12 results	109	8,030 results Focussed search to 'intimidation sur internet' (subject term) =4 results	142
CINAHL	28	1	17	1
ProQuest Dissertations & Theses	305,750 results Focussed search: Anywhere except full text =183 results	1034 results Focus search: Anywhere except full text =18 results	127,581 results Focussed search: Anywhere except full text =20 results	767 results Focus search: Anywhere except full text =18 results
PAIS International	20	1	2	1
PsycINFO	231	42	94	45
PubMED *Restriction to human species*	149	2	49	4
Social Services Abstracts	20	6	55	5
Web of Science	74	9	49	7
Google Scholar	First 250 of 4,140 results, sorted by relevance, for the search *(cyberbullying OR "electronic bullying") AND (Canada)*		119 results for the search (*cyberintimidation AND Canada)*	
Google Web *Restriction to Canadian pages*	215 results for the search *(cyberbullying OR "electronic bullying") AND (Canada)*		153 results for the search (*cyberintimidation AND Canada)*	

The Google searches presented a number of other challenges compared to the formal academic databases. It was necessary to examine many pages of results (up to 25) but it was not possible to save a search and return to it later. Repeating the search after even only a few minutes produced somewhat different results in a different order. Ever-changing current events related to cyberbullying (e.g., debates over legislation, the capture of Amanda Todd's cyberbully) had a considerable impact on the search landscape on a real time basis, making searches impossible to replicate.

Studies were included if they provided self-reported global prevalence rates for online bullying and/or victimization in school-aged Canadians (i.e., <20 years). Studies were excluded if they did not measure or report prevalence rates, inextricably combined Canadian with international data, re-analyzed previously published data, or primarily sampled university students or other adults. Study authors were contacted for more information if it was possible that an identified study could meet inclusion criteria (e.g., if Canadian data were included in international studies). All included English studies were approved by 2 reviewers (TB and AC), and discrepancies were resolved by consensus. Unfortunately, resource limitations precluded a second review for French-language research.

Critical Appraisal

Hoy et al.[81] modified an existing tool used to evaluate risk of bias in observational studies for use with prevalence research. The tool (Table 4, Appendix D, p. 152), originally designed for research on back pain, and consists of 10 items plus a summary assessment. The first four items of the measurement tool assess the external validity of the study in terms of selection bias and nonresponse bias; the first item assesses whether

the results of the study are representative of the national population, which is an important issue for any attempt to describe patterns for a disease or other condition in a country. Items 5 to 10 assess internal validity in terms of measurement bias and bias related to data analysis. Hoy et al.[81] report that the tool shows high inter-rater agreement (91%, Kappa = 0.82).

Item 5 (regarding whether data were collected directly from subjects or by proxy) was not relevant because only self-report studies were included. For item 6 (regarding whether an acceptable case definition was used), the classification of 'low risk of bias' was only assigned if the definition met all 3 criteria of bullying as qualified by Vaillancourt et al.[69]; note that terms such as 'rude' or 'nasty' were not considered sufficient to designate intent. This extract from Olweus' definition, "we don't call it bullying when the teasing is done in a friendly and playful way"[82] is an example of a definition that sufficiently emphasizes intent. For item 9, which assessed whether the duration of the period prevalence estimate was appropriate, a maximum of 3 months was accepted for the designation of low risk of bias. This is because the standard definition of bullying asks students about the 'past couple of months'[56].

Each study was evaluated for risk of bias by two reviewers (TB and AC or BF), and discrepancies were resolved by discussion and consensus. The final summary risk of bias item was a 'judgement call' and the items were not all given the same weight. For example, studies were only given a low risk of bias rating on item 6 (referring to whether an appropriate case definition was used) if the definition met all 3 criteria of bullying; however, in practice the presence of these criteria only has a very small effect on the prevalence of victimization ($d = 0.10$) and no statistically significant main effect on the

prevalence of perpetration[69]. Given that there is a lay understanding of the term 'bullying', it is likely more important that the measure distinguishes between bullying (e.g., 'Have you ever been cyberbullied?') and non-bullying aggression (e.g., 'Has anyone ever been rude to you online?').

Item 10 asked whether the appropriate numerator and denominator were used to calculate prevalence. It was often necessary to assign 'high risk of bias' because authors presented percentages that could not be verified against other data (e.g. tables). In some cases there was no cause to suspect an error, but in other cases reported prevalence rates were clearly at odds with other data (e.g., contingency tables based on prevalence rates for both sexes were discrepant with the overall prevalence rate).

Data Abstraction

The following information was collected from each study by two reviewers (TB and AC or BF):

- Study authors and year of publication
- Date of data collection
- Description of sampling and response rate. Online samples and school-based samples without systematic efforts at population sampling were considered convenience samples (e.g., principals from a couple of local schools allow researchers to survey a few classrooms).
- Age/grade range and sex of subjects
- The definition of cyberbullying and the presence of the criteria of intent, repetition, and a power difference, as qualified by Vaillancourt et al.[69]
- A list of the behaviours identified as cyberbullying in the measure (e.g., name-

calling, spreading private photos, making rude comments)

- A list of the sources of cyberbullying identified in the measure (e.g., Facebook, Ask.fm, Twitter, text messaging)
- Whether the sources/behaviours were presented as possible examples for cyberbullying, or exclusively restricted the measure to the named set of sources/behaviours
- The prevalence rate for cyberbullying and/or cyber-victimization. 'Bully-victims' (respondents who are classified as both victims and perpetrators) were included in totals for both victims and perpetrators.
- The length of the reference period (e.g., past month, past year, lifetime)

Secondary Outcomes

- Prevalence rates for offline bullying (e.g., physical, verbal, social)
- Prevalence rates as broken down by frequency (e.g., sometimes, often, always)
- Prevalence rates as broken down by age/grade
- Prevalence rates as broken down by sex

Data abstraction from papers was supplemented or modified in several ways:

1) Authors were emailed concerning missing information; where these data are presented they are cited as 'personal communication'.
2) In some cases it was possible to find missing information in previous publications based on the same data or in other studies that used the same measure (i.e., for missing information about a measure); the source is cited where this occurred.
3) The data presented for Trach et al.[83] only refers to the grade 4 to 7 subsample, because another included study by Buchanan[84] already presents the grade 8 to 12

data.

4) Although Statistics Canada presents a report[76] of findings from the 2009 *General Social Survey*, it only described results for youth who were aged 15 to 17. By requesting these data through the *data liberation initiative* (a data access program in which Dalhousie University participates), I was able to report the prevalence rates for youth aged 15 to 19 who were enrolled in middle or secondary school; this better represents the target population of this review.

5) In cases of intervention studies with pre-post designs, only the basline value was reported. In the case of a study by Steckley[85], only the post-test data were available.

6) Prevalence rates for offline bullying were only included if they were based on the same reference period as the rate for cyberbullying.

Appendix E (p. 157) presents the data abstraction form. Discrepancies between reviewers were resolved by consensus.

Data Analysis

A meta-analysis was not performed because this would have required at least 3 studies with comparable measures and subjects. There was great heterogeneity across prevalence estimates for both victimization, χ^2 (51) = 31197, $p < 0.0001$, and perpetration, χ^2 (36) = 5275, $p < 0.0001$.

Studies were sorted into 6 groups according to 1) whether the study measured cyberbullying (regardless of how well the definitional criteria were met) or used a broader measure of electronic aggression, and 2) whether the period prevalence was short (1 to 3 months), medium (up to 12 months), or long (lifetime). Again there was significant heterogeneity across prevalence estimates within all of the 6 groups for both

victimization and perpetration (p-values for all 12 χ^2 tests were < 0.01).

Studies designated as measuring 'bullying' include any of those that used the term 'bullying' regardless of how well it was defined (i.e., with all, some, or none of the three criteria). This includes cases where cyberbullying was explicitly defined as aggression (e.g., "Cyberbullying means 'using technology to hurt someone'[86]). I made this decision not only because previous research has shown that use of the definitional criteria only has little to no effect on prevalence[87], but also because the word 'bullying' primes a lay understanding that maps on to the academic definition[58]. Studies classified as measuring 'electronic aggression' only asked about negative behaviours online (in other words, if the authors did not use the label 'bullying' or 'cyberbullying'); e.g. 'Have you experienced mean or cruel online behaviours?'[88]

Results are presented narratively. This was necessary for age/grade and frequency differences, because different studies used different age ranges, grouped ages in different ways, and used different scales for frequency (e.g., never to always vs. 1 to 10+ times). I calculated the median percentage of students involved in cyberbullying who endorsed the response scale item representing the lowest level of frequency.

In some cases the prevalence estimate was not broken down by frequency, but breakdowns were available for each of the few (4 to 7) items that were aggregated to form the prevalence rate. In these cases I calculated a weighted average for the percentage of respondents who endorsed each frequency category across all items (e.g., across 6 items, 'never' was endorsed by an average of 80% of participants, 'sometimes' by 10%, etc.). This was the best that could be done for items with unreported intercorrelations.

The prevalence of cyberbullying in each sample was correlated (Pearson's *r* based on arcsine-transformed proportions) with the prevalence of different forms of offline bullying. The arcsine transform (recommended because of the bounded nature of proportions), had almost no effect on the magnitude of correlations.

Sex differences in prevalence were compared with chi-square tests and odds ratios, and effect sizes were described with Cohen's *d* and r^2 and interpreted according to standard thresholds[89]. Age/grade differences were also examined with chi-square tests.

Ratio and difference scores were used to compare prevalence between sexes and between online and offline forms of bullying.

All measures of central tendency (e.g., of r^2 values or ratio or difference scores) were based on the median rather than the mean of the given distribution.

CHAPTER 3: LITERATURE SEARCH

Literature Search Results

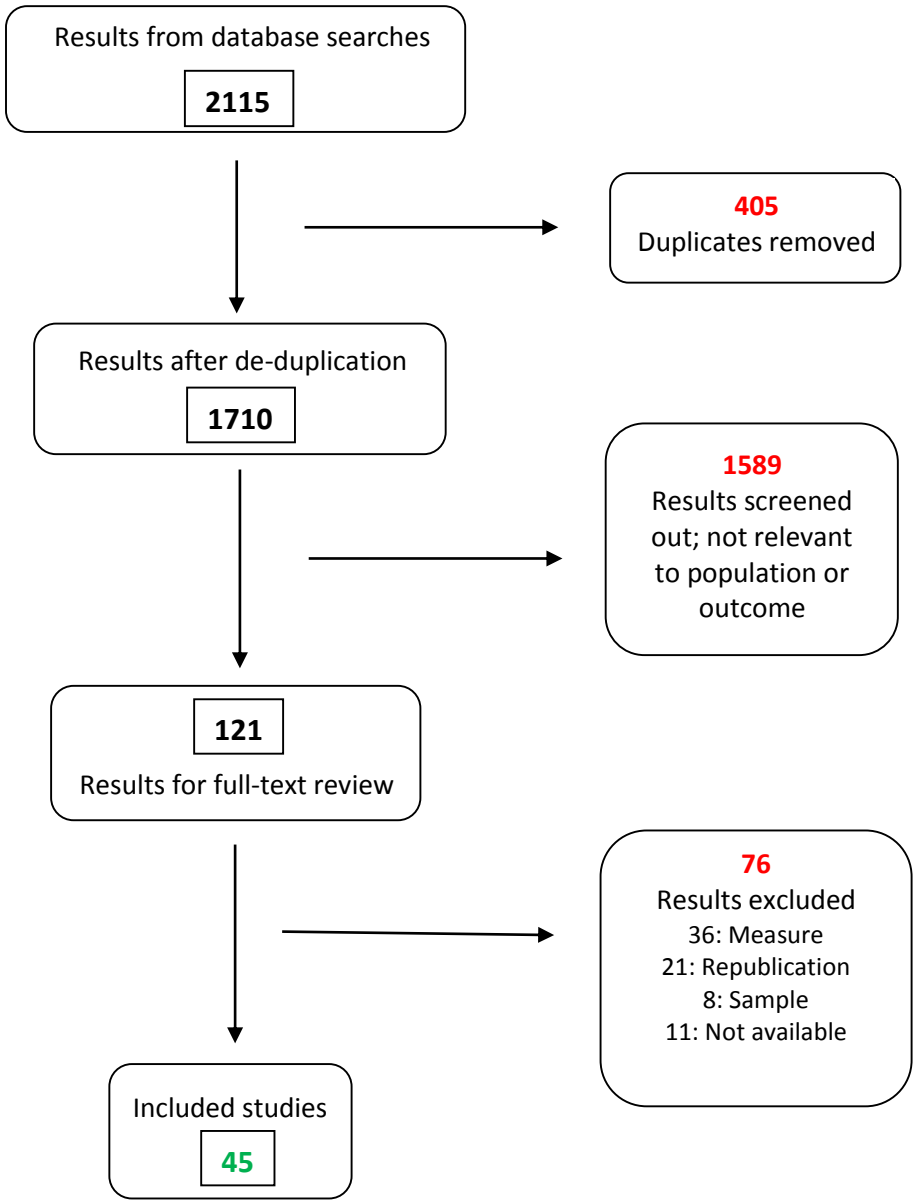
The searches yielded a total of 2,115 results (see Figure 4, p. 27), which were imported to Refworks to remove duplicates, leaving 1,710 unique results. A large number of these were not at all relevant. For example, consider the 10 following titles:

- *Parole on trial: they have been convicted of brutal murders; they are serving their time; the question is: should they get out early?*
- *Making millions: Canada's bold software inventors conquer the world; case studies of five hot firms*
- *Development and evaluation of multidatabase schedulers*
- *Patriarchal beliefs and perceptions of abuse among South Asian immigrant women*
- *Honey bee aggression supports a link between gene regulation and behavioral evolution*
- *Environmental Information Systems and community-based resource management in Ghana: An investigation of institutional policy and implementation context*
- *Playing with fire: Masculinity, health, and sports supplements*
- *Transitioning international students for advanced learning*
- *Posttraumatic stress disorder - Victims of the Saguenay flood*
- *A systematic review of the association between appliance-induced labial movement of mandibular incisors and gingival recession*

These articles were picked up because their abstracts featured words like 'online' or 'electronic' with variants of 'aggression', a word often used in a figurative sense (e.g., aggressive treatment). Articles that were not relevant to the population or outcome of interest (n = 1,589) were screened out in the title-and-abstract scan, leaving 121 studies for a full-text review.

A total of 76 studies were excluded (see Table 5, Appendix F, p. 159): 36 did not measure cyberbullying, 21 were redundant with other included or excluded studies, and 8 did not assess Canadian youth. Authors of 11 studies that could potentially have been included did not respond to email contact or did not grant access to their data. This yielded a total of 45 included studies, which surveyed a total of 302,525 participants.

Figure 4. Flowchart of literature search process



All but one of the 45 included papers assessed victimization, producing a total of 52 victimization rates. Thirty-two studies measured perpetration, with a total of 37 different prevalence rates. Note that one study[34] repeated measurement in the same sample one year later[34], three repeated measurement with 2 to 3 different samples[90–92], and four used multiple measures with the same samples[73,86,93]. Included studies by Cassidy et al.[94] and Jackson et al.[95] reported some different measures from one survey of the same students.

Three studies[96–98] provided measures of online (i.e., internet) bullying separately from phone-based bullying (SMS or voice). These supplemental rates for phone-based bullying were reported but not included in the count of prevalence rates described above. The internet-based measures were favoured as better representing general cyberbullying because they provided the higher prevalence rates, and it is assumed there would be a strong overlap between these subtypes of electronic bullying. Following the same reasoning, a measure of making or experiencing threats in one study[88] was overlooked in favor of the measure of 'mean and cruel behaviours' in the same sample.

Tables of included studies are located in Appendix G (p. 166). Studies that measured electronic bullying (with all, some, or none of the 3 definitional criteria of intent, repetition, and power imbalance) over the past 1-3 months are summarized in Table 6 (p. 166), while those measuring electronic aggression are summarized in Table 7 (p. 173). Studies that measured electronic bullying with prevalence periods up to 12 months are summarized in Table 8 (p. 175), while those measuring electronic aggression are summarized in Table 9 (p. 182). Studies measuring electronic bullying with prevalence periods up to 3 months are summarized in Table 10 (p. 185), while those measuring electronic aggression are summarized in Table 11 (p. 192).

Risk of Bias Assessment

See Table 12 (p. 30) for risk of bias assessments. Note that some studies featured multiple measures that required separate assessments. The majority of measures (37/49 or 76%) were judged to be at high risk of bias. These estimates were based on poor sampling in conjunction with poor measures; for example, convenience samples (whether online or school-based) with low response rates, broad definitions tapping aggression and teasing as well as 'bullying', and long prevalence periods. Twelve evaluations (24%) represented studies with prevalence rates that were at moderate risk of bias. These rates are primarily distinguished by higher-quality, larger-scale sampling. No prevalence rates could be described as having low risk of bias, because studies that used the most rigorous methods were typically collaborations with school boards and thus based on highly localized samples (e.g., one school board in a particular city, or a set of boards in a particular region of one province). Hoy et al.[81]'s tool judges this to be a source of bias (i.e., selection bias)[iii].

The tool is conservative, because unreported information (e.g., response rate) leads to an automatic assignment of high risk. The 'high risk of bias' category spans a considerable range of quality; some studies are far better than others. Internal school board reports usually gave little to no detail about methods, resulting in high risk of bias designations for items related to sampling; yet, research mandated by school boards usually has more representative sampling and higher response rates than convenience samples used by academic researchers because school authorities can compel survey participation (e.g., by organizing mass testing and making use of passive consent procedures).

[iii] External validity and generalizability relate directly to selection bias. An estimate of prevalence in Canada based largely on Toronto students would be too low, and one based on Nova Scotia students would be too high.

Table 12. Risk of bias assessments for included studies

Studies marked with an asterisk (*) were French studies with only one reviewer

Study/Item	1. Population	2. Sampling	3. Selection	4. Response	5. Direct	6. Definition	7. Instrument	8. Data	9. Period	10. Calculation	Summary Risk of Bias Item
Beran & Li[47]	-	-	-	-	+	+	-	+	-	+	**High**
Blais[32]	-	+	+	-	+	-	+	+	+	+	**High**
Bonanno & Hymel[99]	-	-	-	+	+	+	+	+	-	+	**Moderate**
Boucher et al.[100]*	-	-	-	-	+	-	-	+	-	-	**High**
Buchanan[84]	-	+	+	+	+	+	-	+	-	+	**Moderate**
Cappadocia[34]	+	+	+	-	+	+	+	+	+	+	**Moderate**
Cochrane[101]	-	+	-	-	+	-	-	+	-	+	**High**
CPCO[102]	-	-	-	-	+	-	-	+	-	+	**High**
Gardinetti[98]*	-	+	+	-	+	-	-	+	+	+	**High**
Gauthier et al. (2013)[90]	-	+	+	-	+	-	-	+	-	+	**High**
Gomez-Garibello et al.[103]	-	-	-	-	+	-	-	+	-	-	**High**
Halliday[104]	-	-	-	-	+	-	-	+	-	-	**High**
Hinduja & Patchin[105]	-	-	-	-	+	-	-	+	-	+	**High**
Cassidy/Jackson et al.[94,95]	-	-	-	-	+	-	-	-	-	-	**High**
Knighton et al.[21]	-	-	-	-	+	-	-	+	-	-	**High**
Laprise et al.[106]*	-	+	+	+	+	-	-	-	-	-	**High**
Li[38]	-	-	+	-	+	-	-	+	-	-	**High**
Lines[86] (3 month)	-	-	-	-	+	-	-	+	+	-	**High**
Lines[86] (Lifetime)	-	-	-	-	+	-	-	+	-	-	**High**
Magaud et al.[107]	-	-	-	-	+	-	-	+	-	+	**High**
McLean[108]	-	-	-	+	+	-	-	+	-	+	**High**
Microsoft [109]	-	-	-	-	+	-	-	+	-	-	**High**
Mishna et al. [73] (Bullying)	-	-	+	-	+	-	-	+	+	-	**High**
Mishna et al.[73] (Aggression)	-	-	+	-	+	-	-	+	+	-	**High**
Murphy [92] (Study 1)	-	-	-	-	+	+	+	+	+	-	**High**
Murphy[92] (Study 2)	-	-	-	-	+	+	+	+	+	-	**High**
Paglia-Boak et al.[110]	-	+	+	-	+	+	+	+	-	-	**Moderate**
Pandori[111]	-	+	+	-	+	-	+	+	-	-	**High**
Patchin & Hinduja[105]	-	-	-	-	+	-	-	+	-	+	**High**

Study/Item	1. Population	2. Sampling	3. Selection	4. Response	5. Direct	6. Definition	7. Instrument	8. Data	9. Period	10. Calculation	Summary Risk of Bias Item
Perreault[76]	-	+	+	-	+	-	-	+	-	+	**Moderate**
Pettalia[112]	-	+	+	-	+	-	-	+	-	+	**High**
Pisch[113]	-	+	+	-	+	-	-	+	-	+	**High**
Ruggier[114]	-	+	-	+	+	+	+	+	+	-	**Moderate**
Smith et al.[115]	-	+	+	-	+	-	-	+	-	-	**Moderate**
Spears et al.[96]	+	+	+	+	+	-	-	+	-	-	**Moderate**
Stadey[116]	-	+	-	-	+	-	-	+	-	-	**High**
Stanton[91] (Pilot)	-	-	-	-	+	-	+	+	+	+	**High**
Stanton [91] (National)	+	+	-	+	+	-	+	+	+	+	**Moderate**
Steckley[85]	-	+	+	+	+	-	+	+	+	+	**Moderate**
Steeves[88]	+	+	+	-	+	-	-	-	-	-	**High**
Stys[93] (SSS)	-	-	-	-	+	+	-	+	-	+	**High**
Stys[93](EBQ)	-	-	-	-	+	+	+	+	-	+	**High**
Totten et al.[117]	+	+	+	+	+	-	+	+	+	+	**Moderate**
Trach et al.[83]	-	+	+	+	+	+	-	+	-	+	**Moderate**
Van Ingen[118]	-	-	-	+	+	-	+	+	-	-	**High**
Vaillancourt et al.[87]	-	+	+	+	+	+	+	+	+	-	**Moderate**
Wade & Beran[74]	-	-	-	-	+	-	-	+	+	-	**High**
Wong [119]	-	-	-	-	+	+	+	+	+	-	**High**
Yau et al.[20]	-	+	+	+	+	-	-	+	-	-	**High**

Inter-rater reliability for the 10 risk of bias evaluation items over the 46 assessments for English studies was 78% (357/460), and 65% (30/46) across the final summary items.

See Figures 5, 6, and 7 (pp. 32 to 34) for plots of prevalence against risk of bias. Studies at high risk of bias tended to yield higher prevalence rates than those at moderate risk of bias or those initiated by or produced in collaboration with school boards (e.g., safe-school or health surveys). At a glance, measures of electronic aggression appear to produce higher prevalence rates than measures of electronic bullying. However, recall that studies classified as measuring electronic bullying may have had comprehensive definitions or poorly specified definitions, which would contribute to the scatter of the points.

Figure 5. ≤ 3-month prevalence rates for electronic bullying and aggression by risk of bias

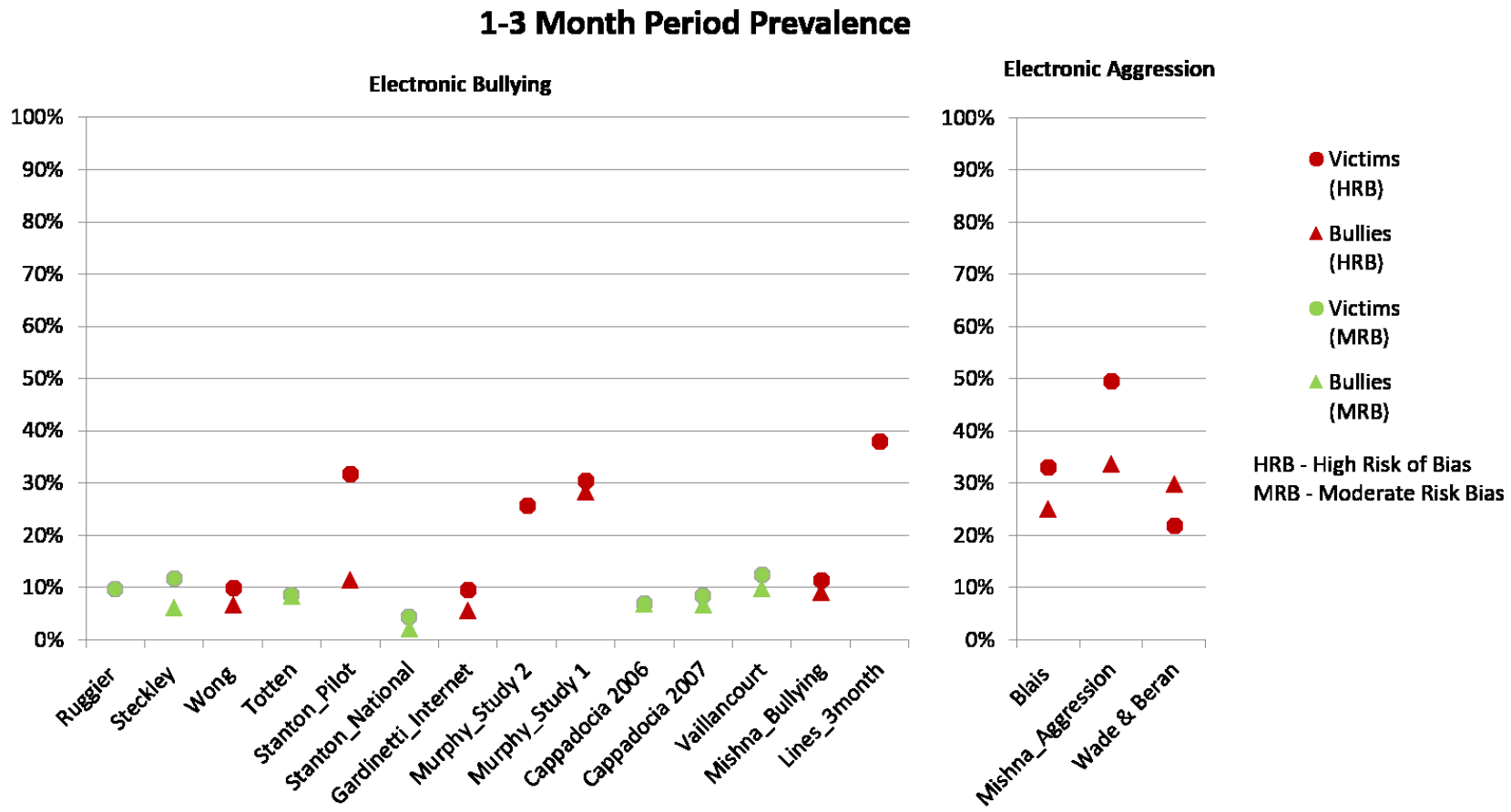


Figure 6. ≤ 12-month prevalence rates for electronic bullying and aggression by risk of bias

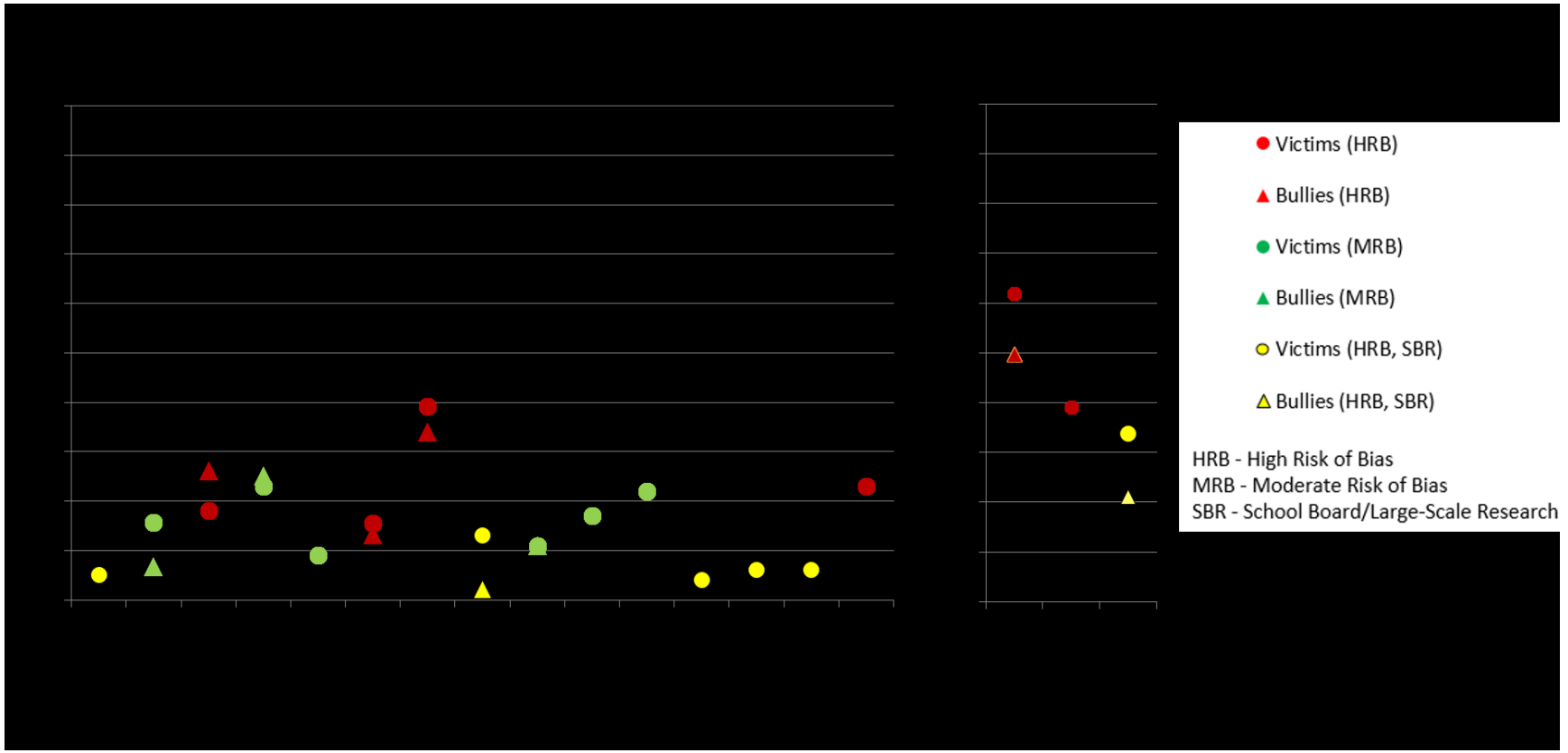
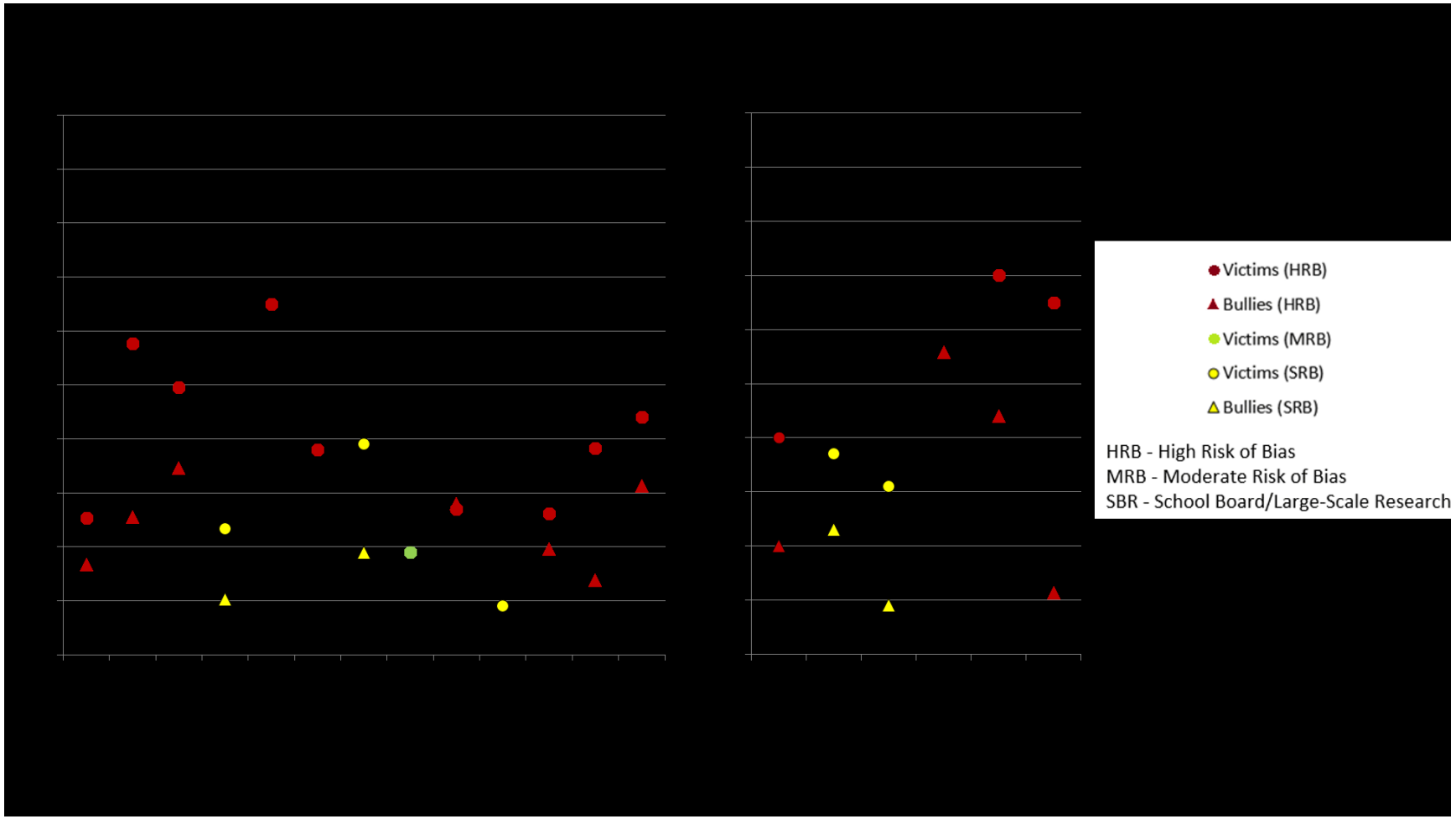


Figure 7. Lifetime prevalence rates for electronic bullying and aggression by risk of bias



CHAPTER 4: RESULTS FOR VICTIMIZATION

Prevalence of Cyber-Victimization

Consult Appendix G (p. 166) for detailed descriptions of sampling and measurement in included studies that measured the prevalence of cyber-victimization.

Victimization by electronic bullying: 1 to 3 months. See Table 6 (p. 166) for the studies described in this section. Four studies measured cyberbullying victimization in the past month using the *Safe School Survey* (SSS), which provides a good-quality definition of 'bullying' (though the use of the word *unfair* to specify a power differential between the victim and the perpetrator can be criticized). Although these studies were conducted from 2003 to 2012 and featured samples of very different quality, the prevalence rates were consistent, ranging from 9% in a large cross-national sample of grade 4 to 12 students taken by the Canadian Public Health Association (CPHA) in 2003[117] to 12% in another large sample featured in a study of grade 4 to 7 students in 10 elementary schools in the Waterloo Catholic District School Board in 2012[85]. Note however that the Waterloo[85] value of 12% in grade 4 to 7 students is best compared to the grade 4 to 7 subsample of the CPHA study[117], which was only 5%. Prevalence rates from studies[114,119] that used the *Safe School Survey* with small school-based convenience samples with poor response rates weighed in at 10% each.

Cappadocia[35] and Vaillancourt et al.[87] used items from the *World Health Organization Health Behaviours in School-Aged Children Survey* (WHO - HBSC) that are similar to those found in the SSS. Cappadocia[35] reported 7% victimization in the past 2 months in grade 9 to 12 students across Canada in 2006, increasing to 8% in the same sample in 2007, whereas Vaillancourt et al.[87] reported 12% victimization in grade 4 to 12

students in southern Ontario in 2005.

Murphy[92] also used the WHO - HSBC items (with a 2-month prevalence period), but with two small non-representative samples. The first estimate of 31% victimization was based on a sample of only 80 grade 9 to 10 students from one school in Ontario that was recruited with an active consent procedure; 33% of the data were excluded (due to inappropriate responses or attrition in the longitudinal study) and the original response rate was not reported. A second sample of 220 grade 7 to 10 students from 4 southern Ontario schools was also based on an active consent procedure, did not report the original response rate, and excluded a large portion (19%) of the sample. A very uneven representation of grades (e.g., 4% in grade 7 vs. 50% in grade 9) confirms the non-representativeness of this sample, which produced a prevalence rate of 26%.

Stanton[91] presented participants with a survey that announced "This section asks about being bullied" (p. 98) and then followed with a good definition of bullying (it did not specify repetition, but Stanton addressed that issue with a response cut point of 'at least two or three times'). The first two items asked 'Have you been bullied' (for different prevalence periods), and easily related back to the definition presented above. The application of the definition to the third item, which asked about electronic medium, is much more ambiguous. The item itself asked "Has anyone been mean to you or called you names online or in a text message in the last month?"; respondents may or may not have felt constrained by the section header and the definition of bullying provided at the top of the page.

Stanton's pilot research with a cross-national sample of 10 to 17 year olds accessing the *Kids Help Phone* website (a telephone counselling service for youth seeking help

anonymously), which over-represented middle school students, yielded a prevalence rate of 32% victimization in the past month. This value is similar to the rate of 38% in the past 3 months offered by a 2007 Kids Help Phone research study[86], which also used an online convenience sample from the same website that again over-represented middle school students. However, that study[86] presented respondents with a definition of cyberbullying that included none of the three criteria, emphasizing negative actions only.

Stanton's[91] prevalence value plummeted from 32% to 4% after administering the same measure used with the *Kids Help Phone* group to a larger sample of the same age range (with a uniform age distribution) recruited by a professional research company using a representative household panel of families based on census data. This is an excellent illustration of the marked bias that can occur when using a convenience sample as opposed to a well-executed sampling strategy (or also, sampling from a high-risk versus a general population; both are forms of selection bias).

Two studies used school-based convenience samples with poor response rates, one with students from two school boards in Toronto[73] and one with students from a single Francophone school in British Columbia[98], measuring the prevalence of cyberbullying without specifying any of the three definitional components. These studies yielded prevalence rates of 12% and 10%, respectively.

In summary, results for measures of online victimization in the past 1 to 3 months were quite consistent for studies using similar measures, averaging about 10% despite some variation in the quality of definitions and samples. A couple of studies clearly demonstrated the inflating effect of biased samples on prevalence rates. A report by Murphy[92], based on small non-representative samples, reported considerably higher prevalence estimates (26%

and 31%). A report by Stanton[91], which used the same measure in two different samples, showed that using a very biased sample resulted in a much higher prevalence rate.

Victimization by electronic aggression: 1 to 3 months. See Table 7 (p. 173) for the studies discussed in this section. Three studies[32,73,74] measured involvement in negative online behaviours. Blais[32] found that 33% of respondents were victims of 'mean' behaviours online or via text message in the past month, using a convenience sample from one high school in southern Ontario.

Mishna et al.[73] and Wade and Beran[74] used the same measure based on 7 forms of online victimization (e.g., name-calling, threats, rumour-spreading, impersonation). Both studies used school-based convenience samples with low response rates with the same grade range (6, 7, 10 and 11), though one sample[73] was in Toronto and the other[74] in (likely Calgary) Alberta. The studies yielded rates of 50% and 22%, respectively. It is useful to compare the 50% prevalence rate found by Mishna et al.[73] with another item from the same survey used with the same subjects; a global cyberbullying item, which the authors did not analyze, produced a prevalence rate of only 12% victimization.

In summary, measures of victimization by electronic aggression in the past 3 months yielded higher prevalence rates (22% to 50%) than studies that measured online bullying in the same time period. In addition to the use of a looser construct, other reasons for the increase in prevalence could be that 1) studies that measured electronic aggression also calculated prevalence as the proportion of students who engaged in at least one of a number of behaviours, rather than by asking a single global item, and 2) their samples were also of lower quality (i.e., school-based convenience samples).

Victimization by electronic bullying: ≤12 months. See Table 8 (p. 175) for the

studies discussed in this section. Studies measuring the prevalence of cyber-victimization with periods up to one year produced a wide range of prevalence rates. A possible pattern to the data is that studies measuring the prevalence of cyberbullying with short global items with little to no further specification (e.g., no definition, none of the three criteria specified, and little to no specification of cyberbullying sources/behaviours) actually produced *lower* estimates than those with greater specification (e.g., more elaborate definitions and longer lists of sources/behaviours). Studies in this section (i.e., electronic bullying, up to 12 months) that used global items with little specification yielded an average prevalence rate that was half the value of that from studies that used more elaborate descriptions including recall cues (11% vs. 21%).

The lowest prevalence rates for victimization were reported in internal school board research by Gauthier et al[90]. The Toronto Catholic District School Board's *Secondary Safe Schools Survey*[120] did not provide a definition of cyberbullying or examples of behaviours, and specified 'internet' as the only source. Prevalence rates for large representative samples of grade 9 to 12 students were 4% in 2010, and 6% in both 2011 and 2012[90]. Although the prevalence period was 'past year', the date of administration was not reported, so the duration of the prevalence period is not quite clear: does it mean the past 12 months, or the months since the start of the academic year in September or the calendar year in January?

The prevalence of victimization is also available from a single school with a small sample of 92 grade 4 to 7 students using the elementary version of the same survey[121], which defined internet bullying with negative actions ("bullying occurs when a person is hurt by the actions of others") and provided 6 examples of sources. This yielded a higher prevalence rate of 13%. The exact prevalence period for this 'past school year' estimate is

also unclear.

Another very low prevalence rate for victimization, 5%, was reported by Laprise et al.[106] This study used a very large carefully-selected sample of 13 to 19 year olds in Quebec with a high response rate. The definition of 'cyberintimidation' was broad and only clearly specified intent. Unfortunately, the reference period is unclear; the measure assessed cyberbullying in the current school year since September, but survey administration was carried out from November through May, meaning that some values included in the average are from very short durations (as little as 2 months).

The 2005 cycle of the *Young Canadians in a Wired World*[96] survey also detected a low prevalence of internet victimization in the past school year: 9%. With surveys administered in February and March, this represents a period prevalence of 6 to 7 months. The survey used a large carefully-selected sample, and both school and student response rates were very high. Bullying was assessed with no definition and while 3 sources were specified, prevalence was measured separately for each source, yielding rates of 9% for bullying via internet, 4% via phone, and 2% via cell phone. Unfortunately the amount of overlap between the different sources of bullying was not reported.

Another very large-scale survey[115] with good sampling methods, the *McCreary Center Adolescent Health Survey*, also assessed internet bullying with no definition. This study found a prevalence rate of 17% in the past 12 months, with data collected from students in British Columbia in 2008. While the definition did not include repetition, response scaling shows us that only 7% were bullied online more than once in the past year.

Cassidy et al.[94] found a very similar prevalence rate of 18%, measuring

cyberbullying in an item with no definition or sources. While Cassidy et al. used a non-representative convenience sample taken from a few schools in British Columbia, the prevalence period was also shorter (5 to 7 months), and the measure was restricted to victimization by other students in the same school.

The highest prevalence rate for this group (i.e., online bullying, ≤12 months, global definitions with little to no specificity), 23%, was reported in a 2013 article by Boucher et al.[100], which recruited an online convenience sample of Quebec youth via Facebook and emails to community youth organizations and LGBT societies. It measured 'cyberintimidation' with no definition, but specified 3 behaviours (rumours, threats, and intimidation). The article, which focussed on non-heterosexual populations, purposely oversampled this group; 85% of the sample identified as gay, lesbian, bisexual, or transgendered. The prevalence of cyber-victimization was 28% in the 38 heterosexual subjects included in the study, compared to 23% in the total sample.

A smaller number of studies measured cyberbullying with more elaborate and specific definitions. The lowest prevalence rate in this group, 11%, was reported by Bonanno and Hymel[99] in a school-based convenience sample from British Columbia with a good response rate. The definition of bullying specified all 3 criteria, 5 electronic sources, and 7 behaviours. However, the date of survey administration for the 'past school year' measure was not reported, meaning that the exact prevalence period is unknown and could be short.

Stys[93] measured electronic bullying in a school-based convenience sample in rural eastern Ontario in 2004, with a poor response rate of 23%. She used two different measures in the same sample, which both assessed the past school year in May or June (8 to 9

months). The first measure was very close to the *Safe School Survey*, but was explicit about the criterion of a power differential between the perpetrator and the victim. The global item described 3 electronic sources and 7 behaviours. Stys' other measure was her *Electronic Bullying Questionnaire* (EBQ), which also featured a full definition of bullying but specified only one behaviour. The EBQ measured prevalence with 6 separate items (representing one source each). The six item EBQ yielded a much higher prevalence rate (39%) than the global item of the SSS (17%), even though it technically assessed fewer sources/behaviours (7 vs. 10).

The *BC Safe Schools and Social Responsibility Survey* measured cyberbullying in a large sample of students from one school district in urban British Columbia, using a definition that specified all 3 criteria; the grade 8 to 12 version of the survey also specified 2 sources (computer or text message) and 3 behaviours (exclude, threaten, humiliate). The grade 4 to 7 version (reported by Trach et al.[83]) found 16% victimization, while the grade 8 to 12 version (reported by Buchanan[84]) found a higher prevalence of 23%. The surveys measured prevalence in the past school year, with administration in the winter or spring (4 to 8 months).

The highest prevalence rate in this category (i.e., electronic bullying, ≤12 months, specific definitions) was reported by the *Ontario Student Drug Use and Health Survey*[110], which found 22% victimization in a large sample of grade 7 to 12 students across Ontario. The period prevalence was a full 12 months. While the sample was carefully recruited, the active consent process led to a student consent rate of only 62%, within a school response rate of 71%.

In summary, surveys assessing victimization by electronic bullying in the past ≤12

months with simple items with little specification showed a consistent range of 4% to 9% victimization in school-board or large-scale research (noting that only 7% of respondents were bullied more than once according to the *McCreary Center Adolescent Health Survey*[115]). These values may have been lower than the ≤3 month estimates of electronic bullying because the samples tended to be higher quality. Surveys that used similar measures with biased samples (i.e., a school-based convenience sample with a low response rate[95] and an online survey focusing on LGBT youth[100]) showed higher prevalence rates (18% and 23%).

Surveys assessing victimization by electronic bullying in the past ≤12 months with more elaborate measures found higher prevalence rates (11% to 22% in school-board or large-scale research). The effect of elaboration is best demonstrated by Stys[93], who used two measures with the same subjects. The shorter measure (based on the *SSS*) yielded a prevalence rate of 16%, while the measure that assessed prevalence as the proportion of students who answered 'yes' to at least one of six separate items produced a prevalence rate of 39%, even though both measures used the same definition of 'electronic bullying' with the same subjects.

Victimization by electronic aggression: ≤12 months. See Table 9 (p. 182) for the studies discussed in this section. Three studies[95,111,112] measured victimization by electronic aggression with prevalence periods up to one year. Data collected from a large sample of high school students in south-western Ontario[111] found that 34% had been victimized by at least one of 4 types of online aggression (forwarding private material, rumour-spreading, making threats, and posting inappropriate material) in the past 6 to 7 months. While the sampling was conducted by a large school board, the use of convenience sampling and

active consent procedures mean that the sample is less representative than those found in school board research using careful sampling designs with passive consent procedures.

Jackson et al.[95] and Pettalia[112] used smaller convenience samples with low response rates. Jackson et al.[95] found that 39% of respondents had received angry, rude, or vulgar messages over the internet or e-mail in the past 5 to 7 months (a small, unreported percentage received these via cell phone text message). This value of 39% is notably higher than the value of 18% yielded by the global, undefined item about victimization by 'cyberbullying' that Cassidy et al.[94] reported from the same survey with the same sample.

The highest prevalence rate in this group was reported by Pettalia[112], who used a non-representative sample of grade 7 to 8 students in Northeastern Ontario. She presented students with 6 highly specific scenarios that described online aggression while emphasizing intent. This resulted in a prevalence rate of 61% over the past 4 to 8 months (the current school year was assessed between January and April).

In summary, Pettalia[112] found almost twice the prevalence of victimization than Pandori[111]; this can be attributed to the use of a smaller, more biased sample, and the estimation of prevalence based on affirmative responses to 1 of 6 items rather than 1 of 4 items. In this set of studies, the use of a global item (by Jackson et al.[95]) was associated with a somewhat higher prevalence rate than the study[111] that measured prevalence as the proportion of students who experienced at least one of 4 items; this can be attributed to the fact that that the study using the global item[95] had a much poorer-quality sample.

Victimization by electronic bullying: Lifetime. See Table 10 (p. 185) for the studies discussed in this section. Lifetime prevalence rates for electronic bullying showed the greatest range of values: 9%[122] to 70%[86].

The lowest value, 9%, comes to us from the 2011 cycle of the Toronto District School Board's student census[122]. The very large sample (over 70,000 grade 9 to 12 students) was based on a passive consent procedure with a very good response rate. Cyberbullying was measured with a global item with no definition, but 5 sources were presented as examples (internet, Facebook, email, cell phone, and text messages). The prevalence rate is restricted to those sources and the reference period is somewhat ambiguous: the item asked "In school, have you ever experienced…" The '*in school*' qualifier may exclude those who have been cyberbullied outside of school, which might be interpreted as after hours in the home or by students who do not attend the same school. The *'have you ever'* wording points to a long or lifetime prevalence period, but the '*in school'* qualifier might lead this to be interpreted as 'while a student at this school', which would be a much shorter prevalence period. Additionally, the item was presented in the context of an annual student survey in which many other items referred to 'this year', which means that students could have accidentally misinterpreted the item as having a one-year reference period.

The next lowest prevalence rate comes from the 2009 cycle of Statistics Canada's *General Social Survey*[76], which interviewed respondents across the 10 provinces aged at least 15 who answered landline telephones contacted through random digit dialing. The response rate was 62%. I restricted the data, obtained via the *Data Liberation Initiative*, to the 822 respondents aged 15 to 19 who were enrolled in school (but not university or college). The (population-weighted) prevalence of victimization was 19%. The survey used a definition of cyberbullying that only specified hostile intent, and provided 4 examples of electronic sources and 4 examples of behaviours associated with cyberbullying.

Seven authors[38,47,101,107,108,113,116] measured lifetime prevalence in school-based convenience samples, with the exception of one clinic setting. The lowest victimization rate, 25%, was found by Li[38] in a 2004 sample of grade 7 to 9 students from 3 middle schools in Calgary. She measured cyberbullying with no definition, specifying only 3 sources and no behaviours. In a similar but larger sample recruited from 9 Calgary middle schools (likely around the same time frame), Beran and Li[47] found a victimization rate of 58%; in this case, the definition of 'harassment using technology' included all 3 definitional elements of intent, repetition, and power, and a total of 13 source and behaviours were specified as examples. It is interesting to note that in 2005, Beran and Li[123] reported only 21% victimization and 3% perpetration based on the same sample. The earlier paper did not classify those who reported involvement 'once or twice' as victims or perpetrators, demonstrating a major effect of using a cut-point.

Cochrane[101] and Pisch[113] measured cyber-victimization in non-representative school-based convenience samples from Saskatchewan middle and high schools, respectively. Cochrane[101] adapted her measure from Beran and Li[123], but specified more source and behaviour examples of cyberbullying; Pisch[113] further adapted the measure to cite fewer. Cochrane reported 50% victimization in grade 7 to 9 students, which is comparable to Beran and Li's rate of 58%[47]. Pisch[113] reported a somewhat lower rate of 44% in a sample consisting largely of grade 11 to 12 students.

McLean[108] reported a 27% prevalence of victimization in a convenience sample of 448 grade 9 to 12 students from 6 high schools in Northeastern Ontario. While 'bullying' was not defined for the item "Have you ever been bullied or threatened by someone in any of the follow *(sic)* ways? Check all that apply", the item response options were somewhat

perplexing. They included ‘digital bullying’ (3%), ‘via text messages’ (2%), ‘in internet chat rooms’ (6%), ‘via email’ (5%), ‘via websites’ (1%), and ‘I have not been cyberbullied’ (73%). Prevalence was calculated as the reverse of the last item (100% - 73% = 27%). In a different item, 57% of participants indicated that they had been cyberbullied since September; however, only 25% of respondents answered that item.

The Nova Scotia Bullying and Cyberbullying Task Force conducted focus groups with youth[116]. While the number of classes from French and English regions participating in the focus groups were purposively sampled, it is likely that participation in the focus groups was self-selected by students, and the response rate was not reported. Polling was preceded by a discussion of what students thought cyberbullying was; reportedly, many students responded with source examples (e.g., it happens on Facebook). Thirty-nine percent of the students indicated that they had been cyberbullied, and a further 8% said they weren’t sure (these students struggled with the notion of intent, and thought the perpetrator might have just been joking).

A number of studies used samples that could be considered more biased than school-based convenience samples. Magaud et al.[107] measured ‘bullying through technology or communication devices’ with no definition (it is unclear whether 8 examples of sources were provided to participants on the survey, or reported as post-hoc response categories). Although the small sample of 50 adolescents from Calgary was considered to be at high clinical risk for psychosis, the reported prevalence of 38% victimization is typical for this type of research design.

Five studies[21,86,104,105,124] examined lifetime prevalence rates in online convenience samples. The lowest value in this group, 23%, was found in a largely school-based sample

from Nova Scotia[104]. The survey, conducted by the Nova Scotia Bullying and Cyberbullying Task Force, was widely promoted in schools and on school websites. The majority of respondents (61%) were in grades 7 to 9. The survey defined 'cyberbullying' with intent and power and restricted the measure to 4 sources, but left it up to the user to decide if repetition should be part of the definition.

Hinduja and Patchin collected data in 2004 and 2005 using online surveys posted on entertainment websites geared to youth (e.g., Harry Potter, online gaming, musical artist). Prevalence rates for the Canadian subsamples were obtained from personal communication with Justin Patchin. The surveys used the same measures of cyberbullying with different samples. Cyberbullying was defined as behaviour that could include 6 online negative behaviours (e.g., bothering someone, name-calling, exclusion). The prevalence rate for the Canadian subsample (n = 46) associated with the 2006 report[124] was 26%. The original international youth sample for this study (n = 384) was 85% female. The next online sample[105], collected from December 2004 to January 2005, was also predominantly (82%) female; this time, the authors randomly selected a number of female respondents to match the number of males. The Canadian subsample (n = 365) yielded a prevalence rate of 38%.

The highest prevalence values in the online convenience sample group were reported in 2007[86] and 2011[21] work by *Kids Help Phone* researchers, who recruited visitors to their website from across Canada. The samples were largely (74% to 76%) female, and 54% of respondents were aged between 13 and 15. In 2007[86], the lifetime prevalence rate was 70%, based on a definition of cyberbullying that only emphasized negative behaviours, but listed 12 sources or behaviours as examples. In 2011[21], the prevalence was 65%.

Knighton[21] attributed the 5% decrease to a shift in wording; in 2007 'cyberbullying' was not named explicitly in the item, whereas it was in 2011. The 2007 version did in fact have a definition of cyberbullying at the top of the survey, but the item itself referred to electronic aggression: "while online, has anyone ever called you names, threatened you, spread rumours about you, or sent around pictures or words that made you uncomfortable"[86] (p. 28). By contrast, the 2011 survey asked "Have you ever been cyberbullied (someone using the internet, email, Facebook, text messaging, or IMing to harass, humiliate or threaten you)?" (C. Mak, personal communication, 7 November 2014).

In summary, estimates of the lifetime prevalence of electronic bullying yielded a large range of estimates (9% to 70%), but these can be broken down into subgroups. School board or large-scale research found the lowest prevalence rates (9%[122] and 19%[76]), and the lower of these two estimates was based on wording that could restrict the measure to events happening at school and caused by classmates.

Estimates of cyber-victimization taken from school-based convenience samples fell in the range of 25% to 58%. The studies that asked about cyberbullying without providing any definition and specifying few to no sources fell on the lower end of that range (25% to 27%)[38,108], while those using more elaborate descriptions with more sources fell at the higher end of the range (44% to 58%)[47,101,107,113].

Estimates of cyber-victimization taken from online convenience samples fell in the range of 23% to 70%. The lowest value, 23%, was yielded by a survey[104] given in 2011 by the Nova Scotia Task Force on Bullying and Cyberbullying that was essentially a school-based sample because the survey was promoted within schools and on school websites. Higher prevalence values were associated with online convenience samples posted on

entertainment websites (26% to 38%)[105,124]; however, these are also older estimates from data collection in 2004 and 2005. The highest prevalence rates from online convenience sampling (65% and 70%) were produced by surveys posted on the *Kids Help Phone* website[21,86].

Victimization by electronic aggression: Lifetime. See Table 11 (p. 192) for the studies discussed in this section. Three studies[88,103,109] investigated the lifetime prevalence of online aggression. Microsoft's corporate citizenship division has been investigating cyber-victimization since 2004[125]; however, only their most recent report from 2012[109] could be obtained for this review. Using a cross-national sample of 300 8 to 17 year olds collected by a professional research company advertising representative and reliable panel data[126], Microsoft reported that 40% were victims of mean behaviours on the internet. The third phase of the *Young Canadians in a Wired World* survey[88] reported a very similar value of 37% victimization by 'mean and cruel online behaviours' from a large cross-national sample collected in 2013. The YCWW survey also included a separate item on threats, which yielded a 31% prevalence rate.

The highest prevalence rate in this set of studies was reported by Gomez - Garibello et al.[103] This 2012 report found that 65% of participants were victims of at least one of 16 negative online experiences (e.g. "Have you received a threatening message from another student that made you afraid?"; C. Gomez - Garibello, personal communication, 10 June 2014). The small sample of students was recruited form one private high school in Quebec, and the response rate was not reported.

In summary, studies measuring the lifetime prevalence of electronic aggression produced a higher range of prevalence estimates than studies measuring the lifetime

prevalence of electronic bullying (i.e., minimum values were 37% versus 9%). Two studies[88,109] based on global items with better samples (a large school-based sample and a sample based on nationally-representative household panels) found consistent values of 37% and 40%. The highest prevalence rate in this group (65%)[103] was associated with a small and biased school-based convenience sample that calculated prevalence as the proportion of students who had at least one of a large number of experiences.

Frequency of Cyber-Victimization

Twenty-five studies provided information about the frequency of cyber-victimization (see Table 13, p. 194). While different studies used different measures of frequency, the general pattern was overwhelmingly of a positively skewed distribution: most students who identified as victims experienced only one or two incidents in a given period, and progressively fewer students experienced frequent victimization.

Seventeen studies used Likert-scale measures of frequency. While the scaling was heterogeneous, with the lowest category representing values from 'once' up to 'less than once a month' in varying periods, a median of 60% of participants endorsed the response scale item that represented the lowest frequency of victimization. This value was higher (80%) in studies that measured prevalence periods of 12 months or less, and lower (57%) in studies measuring lifetime prevalence. Typically no more than 2% of respondents endorsed the highest (most frequent) response scale option; the highest values (of 5% to 10%) were all associated with lifetime prevalence estimates.

Four studies provided item means based on 4- or 5-point Likert scales; these values were very low, hovering between anchors like 'never' and 'rarely'.

Several studies did not give an overall breakdown of prevalence by frequency, but

instead presented frequency distributions for each item in a set of questions. I calculated the weighted average proportion of students who endorsed each scale level (across all items). Overall, most students (71% to 88%) answered 'never' to each item, and a small minority (2% to 6%) selected the response option representing the highest frequency of victimization.

Comparison of Online vs. Offline Victimization

There were 26 estimates of online victimization with corresponding measures of offline victimization from the same sample (see left side of Table 14, Appendix H, p. 199). As demonstrated in Figure 8 (p. 54), the typical pattern was that victimization by general bullying had the highest prevalence, followed by verbal, social, and physical bullying. Cyber-victimization typically had the lowest prevalence.

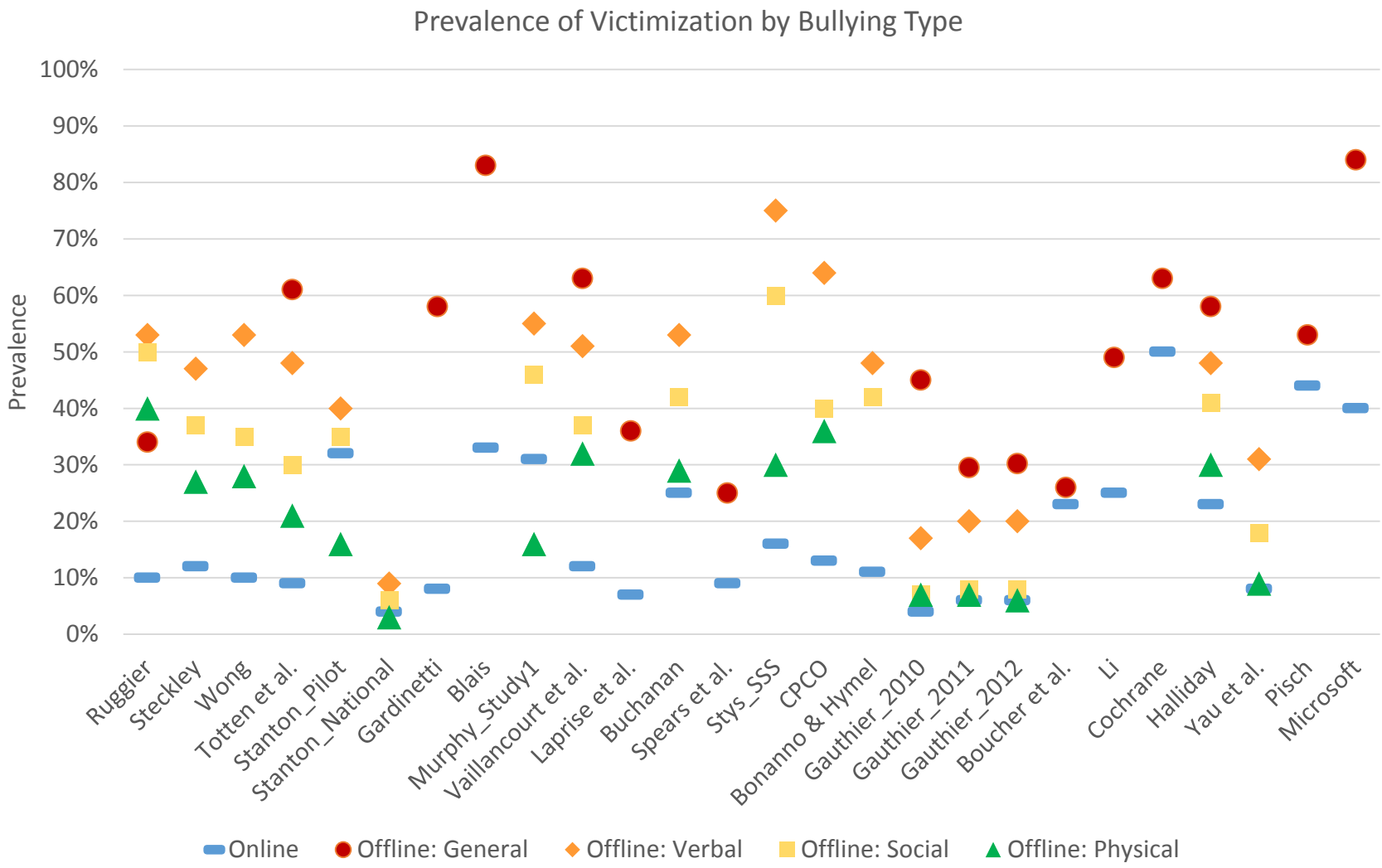
Based on 16 comparisons, the median ratio of cyber-victimization to victimization by general bullying ($\hat{p}_{CV}/\hat{p}_{GV}$) was 33%, indicating that the prevalence of cyber-victimization was about one third the prevalence of general victimization by bullying. These values were also highly correlated ($r = 0.57$). 'General' victimization refers to that which is not specific to any one type of bullying (e.g., 'Have you been bullied?'). Note however that rates from global items do not correspond to the combination of rates from more specific items. Vaillancourt et al.[87] reported that 38% of participants had been bullied according to Olweus' single global item, yet 63% indicated that they had been either verbally, socially, physically, or cyber- bullied in subsequent items. Similarly, Ruggier[114] found that 34% of her sample indicated that they had been victimized according to a general global item, yet prevalence rates for specific forms are all higher, from 40% for physical victimization to 53% for verbal victimization.

In 17 cases, cyber-victimization can be compared to specific forms of offline victimization. The median ratio of cyber-victimization to verbal victimization ($\hat{p}_{CV}/\hat{p}_{VV}$) was 26%, indicating that the prevalence of cyber-victimization was about one quarter the prevalence of offline verbal victimization. These values were also moderately correlated ($r = 0.47$; n = 16).

The median ratio of cyber-victimization to social victimization ($\hat{p}_{CV}/\hat{p}_{SV}$) was 44%, indicating that the prevalence of cyber-victimization was just below half the prevalence of offline social victimization. These values were also highly correlated ($r = 0.58$; n = 17).

The median ratio of cyber-victimization to physical victimization ($\hat{p}_{CV}/\hat{p}_{PV}$) was 67%, indicating that the prevalence of cyber-victimization was two thirds the prevalence of offline physical victimization. These values also shared a small correlation ($r = 0.28$; n = 16).

Figure 8. Online vs. offline victimization



Prevalence of Cyber-Victimization by Sex

Thirty-four prevalence estimates were available by sex (see Table 15, Appendix H, p. 200, and Figure 9, p. 57). Forty-one percent (n = 14) reported that females were significantly more likely to be victimized than males, 9% (n = 3) reported that males were significantly more likely to be victimized than females, and 50% (n = 17) found no significant difference in prevalence between females and males. Among those studies that reported null results, 65% (n=11) trended in the direction of higher prevalence in females, 18% (n = 3) trended in the direction of higher prevalence in males, and 18% (n = 3) did not include information about the direction of the difference.

Odds ratios could be calculated for 31 estimates; however, in four cases[47,91,107,117], the odds ratios were estimated assuming equal prevalence for males and females, because there was no statistically significant sex difference in prevalence and the percentage of victimized students of each sex was not available. The odds ratios (see Figure 10, p. 58), tend to fall in the direction of higher prevalence in females than males, but sex differences in prevalence were small. The median of absolute differences between the proportions was 3% (in the direction of higher female victimization), and the median ratio of female to male victimization ($\hat{p}_F/\hat{p}_M$) was 1.2 (also indicating higher female victimization). Odds ratios ranged from 0.28 to 2.99 with a median of 1.22 (where values above one indicate higher victimization in females compared to males).

Magnitudes of Cohen's *d* for statistically significant differences ranged from 0.2 to 0.7 (small to medium), with a median of 0.24 (small). Magnitudes of Cohen's *d* for all 31 estimates yielded a somewhat lower median of 0.20 (small). Values for r^2 for statistically significant differences ranged from 1% to 11%, with a median of 2.89% (small). Values of

r^2 for all 31 estimates yielded a somewhat lower median of 1% (small). Forty-five percent of all r^2 values (n = 14) fell below 1% (very small), 52% (n = 16) fell between 1% and 9% (small), and one (3% of 31) was classified as medium, with an r^2 value above 9%.

Figure 9. Prevalence of cyber-victimization by sex

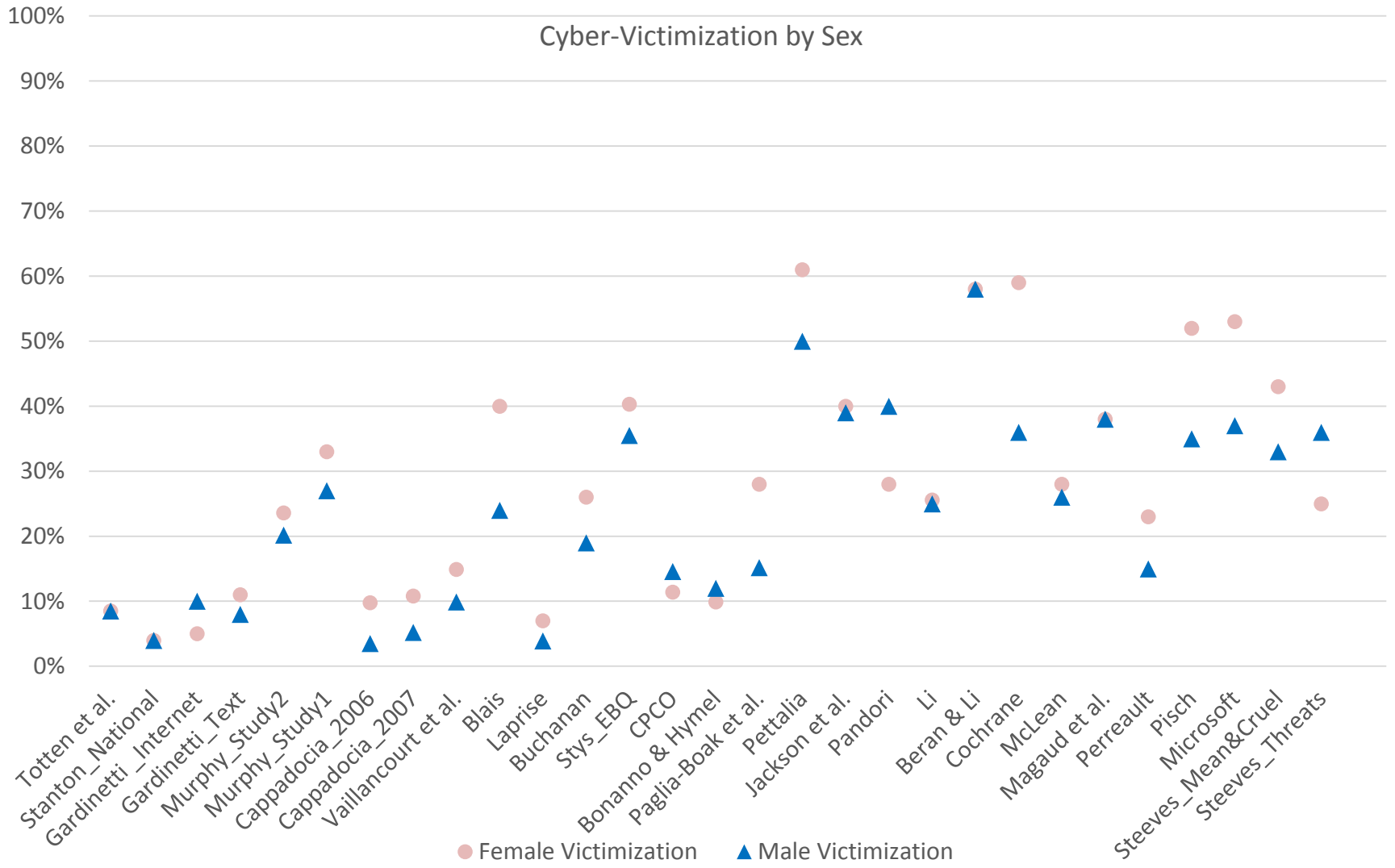
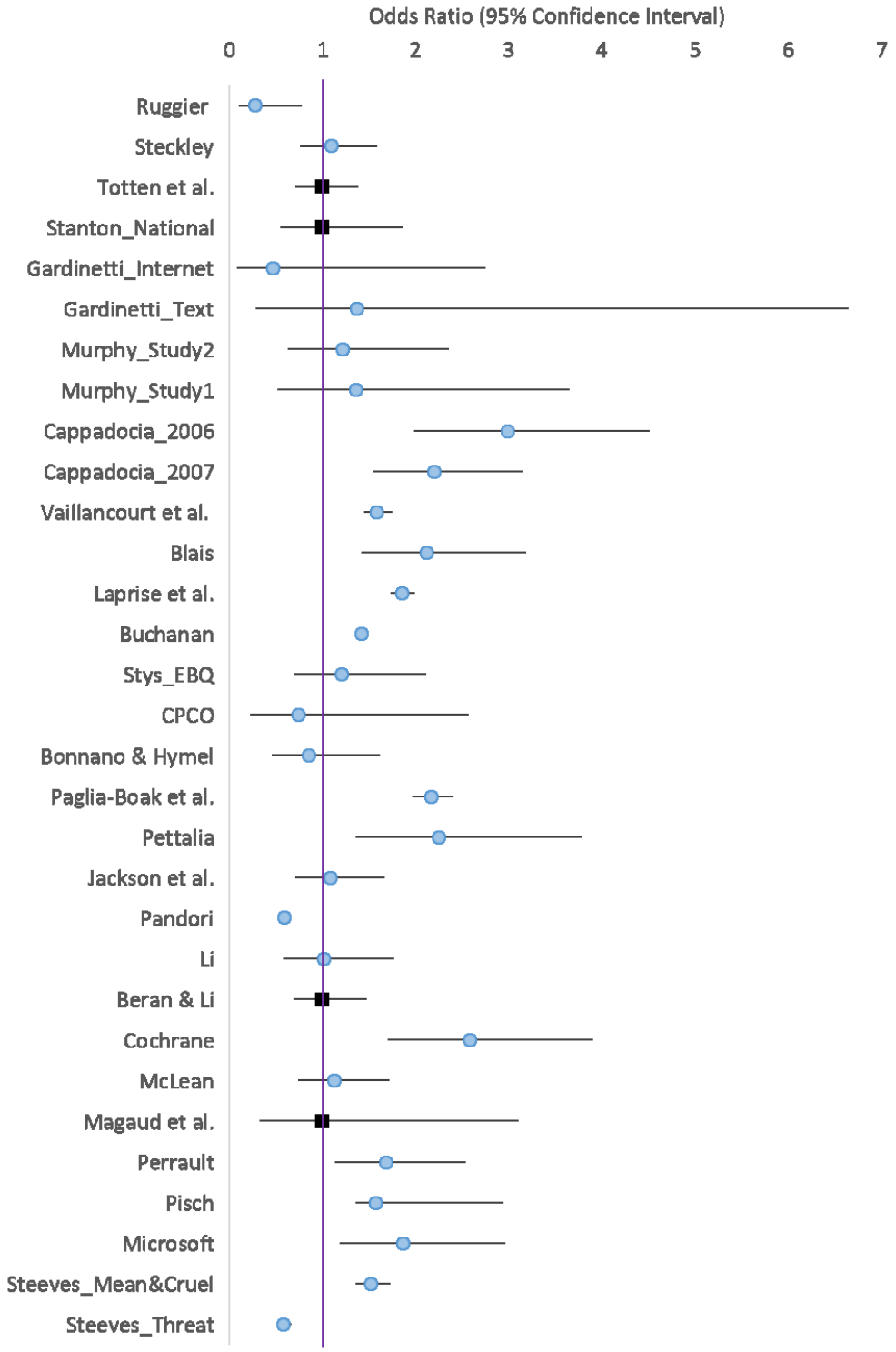


Figure 10. Odds ratios for sex differences in cyber-victimization

The four values represented by black squares (odds ratios assumed to be 1) were estimated from studies with results that were not statistically significant. Odds ratios above 1 indicate a higher prevalence of victimization in females compared to males.



Prevalence of Cyber-Victimization by Grade/Age

Twenty-three estimates of cyber-victimization provided information about grade or age differences; see left side of Table 16, Appendix H, p. 208). It is important to distinguish between studies measuring lifetime prevalence and those using shorter reference periods, as lifetime prevalence naturally increases with age due to the lengthening of the exposure period. It is also important to note that this section discusses the relationship between prevalence and age/grade using different subjects across grades; i.e., the comparisons are based on cross-sectional rather than longitudinal data.

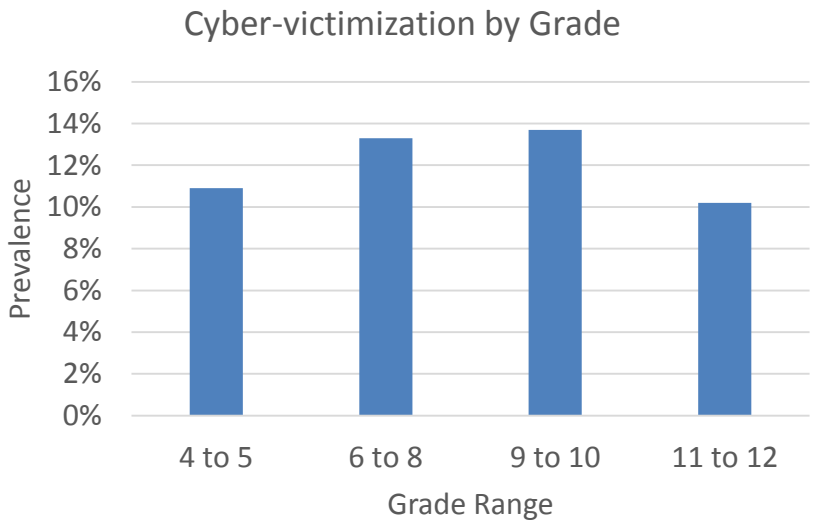
≤ 12-month period prevalence. The general trend among these studies is that prevalence increases from elementary school until around late middle school and then levels off or decreases in high school. There were 14 prevalence estimates with reference periods up to 12 months (inclusive). Seven of these comparisons (50%) found no significant grade/age effect; one (Wong[119]) used a very restricted age range (grades 6 to 7), and the remainder featured older students: grades 9 to 12 in Blais[32], grades 9 to 11 and 10 to 12 in Cappadocia[34], grades 9 to 10 in Stys[93], and grades 8 to 10 in Bonanno & Hymel[99]. Although Stanton[91] used a broader age range, with students aged 10-17, she used a cut-point that resulted in a very low overall prevalence rate (4% in the national sample), which could make age effects hard to discern. In fact, item means from a 5-point Likert scale measure showed a trend to increase and then level off, from 1.32 in respondents aged 10 to 11 up to 1.52 in respondents aged 16 to 17.

Steckley[85] showed that prevalence increased with grade in grade 4 to 7 students, increasing from 6% in grade 4 students to 14% in grade 7 students. Using the same measure, a study by the Canadian Public Health Association[117] found that the prevalence

of cyber-victimization was higher in grade 8 to 12 students (11%) than in grade 4 to 7 students (5%). This study also noted that 88% of cyberbullying (victimization and perpetration) occurred in grade 8 to 10 students (aged approximately 12 to 16). Cassidy et al[94], commenting on data published by Jackson et al[95], reported that "age 14 comes up time and time again in this study as being a key age…for being victimized" (p. 391), although they did not perform statistical tests on the data. In grade 6,7, 8, and 9 students, Wade and Beran[74] found that grade 7 students were more likely to be victimized than grade 6 or 11 students for three of the seven types of cyber-victimization they assessed.

A large survey of Southern Ontario students by Vaillancourt et al.[127] showed a curvilinear relationship between prevalence and grade, increasing from 11% in grade 4 and 5 students, peaking at 14% in grade 9 and 10 students, and then decreasing to 10% in grade 11 and 12 students (see Figure 11).

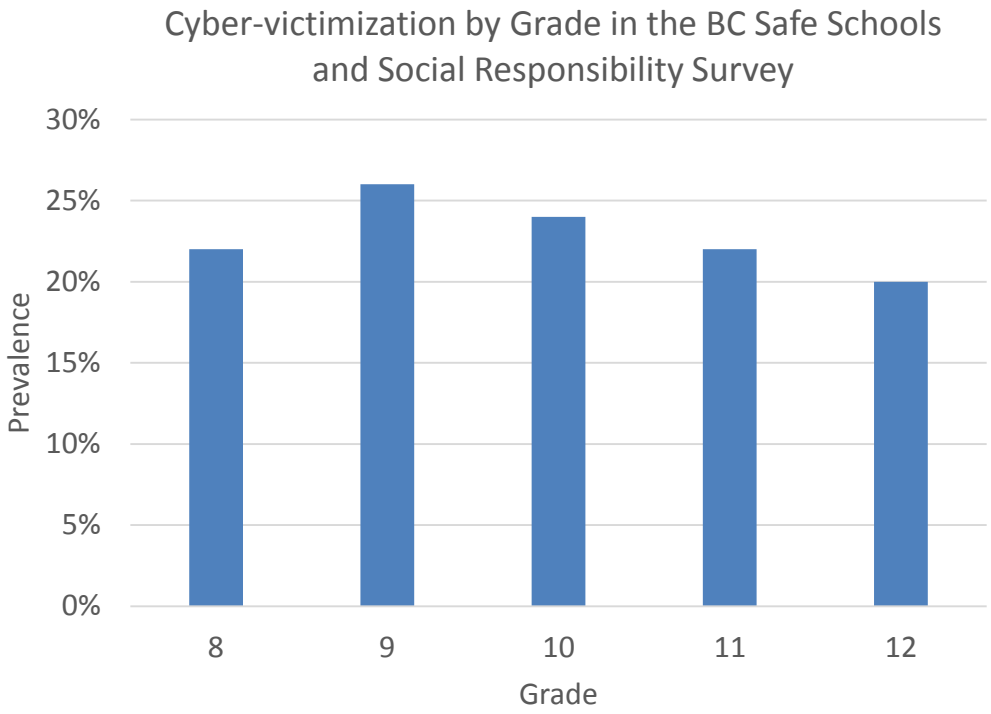
Figure 11. 3-month prevalence of cyber-victimization by grade in Vaillancourt et al. (2013)



Data from the BC Safe Schools and Social Responsibility Survey, a large-scale survey reported by Buchanan[84], found a similar relationship in grade 8 to 12 students (see Figure 12, p. 61), with victimization increasing from 22% in grade 8, peaking in grade 9,

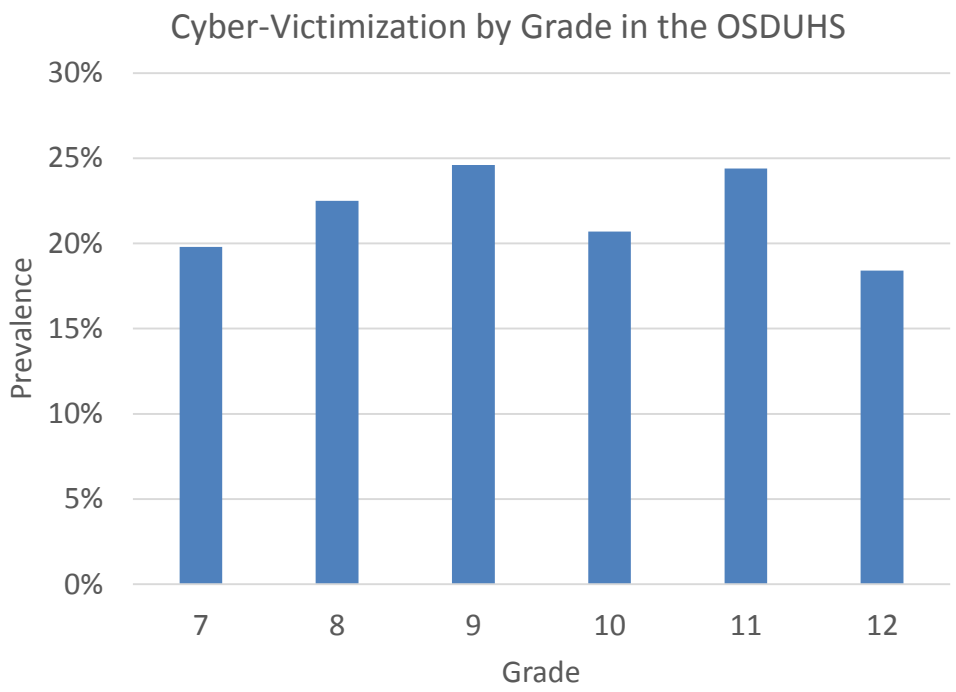
and decreasing to its lowest value (20%) in grade 12. Trach[83] provides data from the same survey used in elementary students, which showed that the prevalence of cyber-victimization was lower (16%) in grade 4 to 7 students.

Figure 12. 4-to-8-month prevalence of cyber-victimization by grade in Buchanan (2012)



Data from the Ontario Student Drug Use and Health Survey[110] shows a significant association between cyber-victimization and grade; the pattern (see Figure 13, p. 62) shows that prevalence increased from grade 7 to 9, peaked from grade 9 to 11, and ultimately decreased to its lowest point in grade 12.

Figure 13. 12-month prevalence of cyber-victimization by grade in Paglia-Boak et al. (2012)



Murphy[92] (Study 2) did not test grade differences in prevalence, but tabulated percentages show that cyber-victimization peaked in grade 9 for boys and grade 10 for girls; however, it is difficult to generalize from this study on account of very poor sampling.

Mishna et al.[73] did not test overall grade differences, but using available tabulated data, I calculated that the weighted average of the percentage of students who reported being a victim across the 7 different items was 60% for grade 6 to 7 students versus 54% for grade 10 to 11 students.

Lifetime period prevalence. Unless the incidence of cyber-victimization falls to zero or strong cohort effects are present, one would expect lifetime prevalence rates to naturally increase with age. There were seven estimates of the lifetime prevalence of cyber-victimization that included information about grade or age differences; only two of these did not detect significant grade effects. The first, by Magaud et al.[107] did not report the age

range of the participants, and did not provide any breakdown of the prevalence by age. The second, by Pisch[113], did show an increasing trend (from 41% in grade 11 to 45% in grade 12) that did not reach statistical significance.

Results from Cohrane[101] showed a seemingly linear increase in lifetime period prevalence from grade 7 to 9, as did Stadey[116] in elementary, middle, and high school students. The Young Canadians in a Wired World (Phase III) Survey[88] provided detailed information on prevalence by grade from grades 4 to 11. The relationships for both the measures of 'mean and cruel behaviour' and 'threats' (see Figure 14 and Figure 15, p. 63) show steady increase until about grade 9, when prevalence levels off. This suggests that the incidence of cyber-victimization is low in high school compared to elementary and middle school.

Figure 14. Lifetime victimization by mean & cruel behaviours in Steeves (2014)

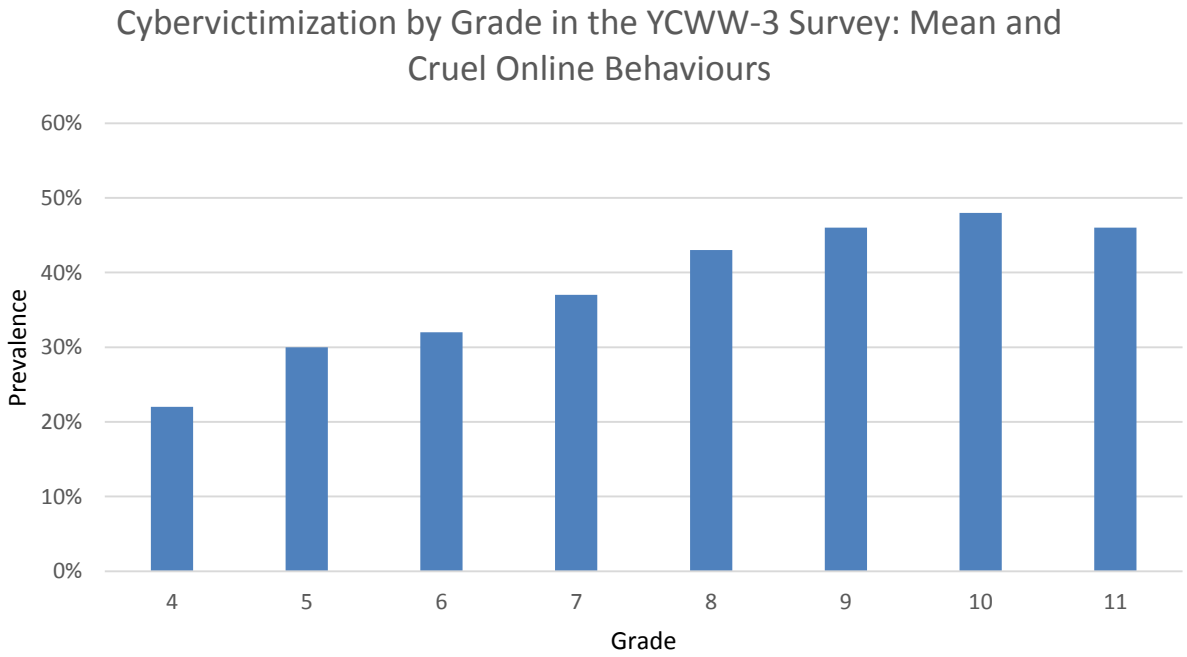
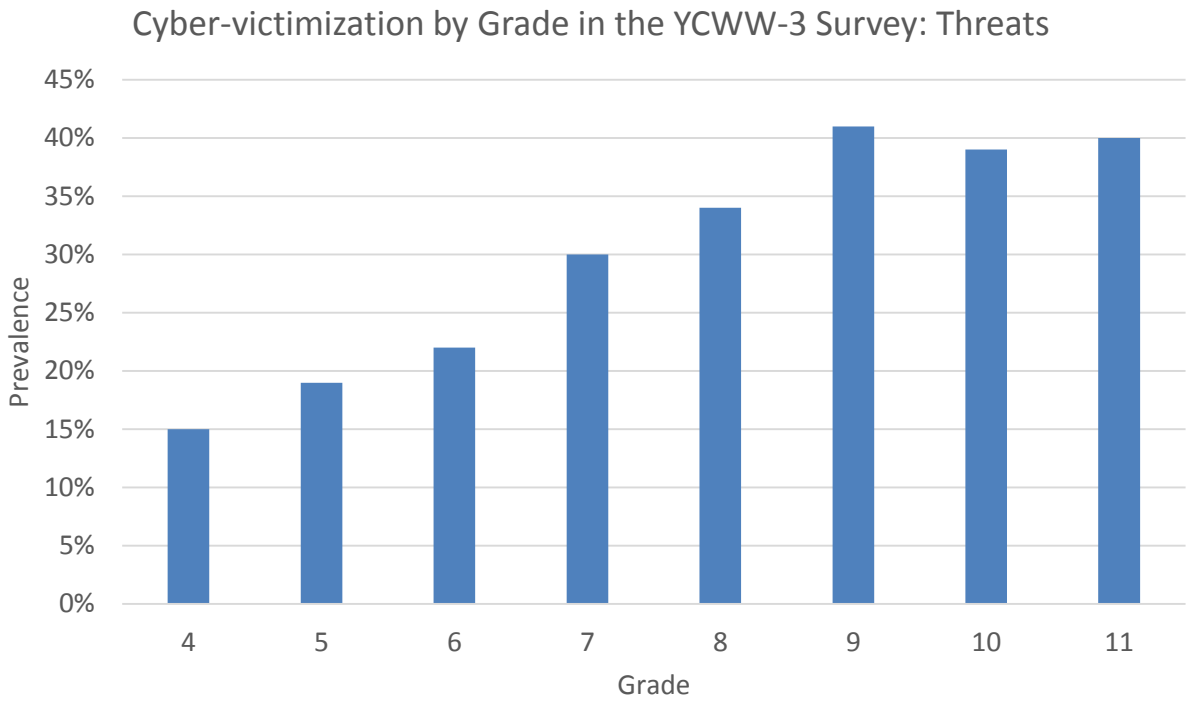


Figure 15. Lifetime victimization by threats in Steeves (2014)



There are a couple of exceptions to the pattern of increasing lifetime prevalence of victimization. First, a report on 8 to 17 year olds by Microsoft[109] noted that prevalence was 40% in respondents aged 8 to 12, but only 27% in respondents aged 13 to 17. The report does not provide any further detail and did not test statistical significance; in fact, it is not even possible to verify the result (presented in a bullet point in a short report), e.g., from other data in tables. Second, data from the Statistics Canada General Social Survey[76] showed a decrease from 19% in 15 to 17 year olds who were in school full-time, to 15% in 18 to 19 year olds who were in school-full time (but not in university). It may be noted that the sample of 18 to 19 year olds (n = 247) was much smaller than the sample of 15 to 17 year olds (n = 574). The survey showed further decreases with age past adolescence: young adults aged 18 to 24 were three times more likely to have been cyber-victimized than those

aged 25 and over, at 17% versus 5%[iv]. This likely reflects a cohort effect combined with decreasing incidence of cyber-victimization beyond high-school. For example, 50 year olds would report a lower lifetime prevalence of cyber-victimization than 15 year olds, because 50 year olds were not cyberbullied at school (when the technology was not available), and mature adults are not exposed to cyberbullying in the way that teenagers are.

Overall, the effects of age on the prevalence of cyber-victimization are small. Effect sizes for statistically significant differences were characterized as very small or small. The largest effect size was an r^2 value of 7% found between grade 4 to 7 and grade 8 to 12 students in Totten et al.[117]

Regional Differences

Several studies suggest the prevalence of cyber-victimization is lower for students in Toronto. Surveys by the Toronto Catholic District School board (4% to 6% prevalence) and the Toronto District School board (9% prevalence) produced very low estimates, especially given the reference period (e.g., past year and lifetime). A lower prevalence of cyber-victimization in Toronto youth was also noted by the Ontario Student Drug Use and Health Survey[110]; this result was observed for bullying at school as well. The prevalence of cyber-victimization was 22% for Ontario as a whole, whereas it was only 18% in Toronto and 15% in the region of north Toronto. It was highest (29%) in the Hamilton area. Mishna et al.[73] also found a low prevalence of cyberbullying (12% victimization and 9% perpetration) in Toronto, even using a poor definition and a non-representative sample.

[iv] Note that these prevalence rates are not directly comparable to the values for 15 to 17 and 18 to 19 year olds because the latter were restricted to those enrolled in education (secondary school) on a full-time basis.

The report of the *Young Canadians in a Wired World* (Phase III) survey[97] noted that young people interviewed in various cities expressed irritation and exasperation at the subject of the dangers of cyberbullying. Valerie Steeves, the author of the report, shared that this sentiment was particularly pronounced in Toronto youth (V. Steeves, personal communication, 13 June 2014). For example, consider the response of these Toronto youth who were asked if their schools talked about cyberbullying:

> *Emma*: All the time, every year they have this big meeting. *Taylor*: Yeah, big presentation. *Emma*: They're like 'You don't know what this means! You could make people commit suicide!' And they have these people like 'I used to be cyberbullied, it was so sad' [sarcastic tone], and it's like 'oh my god, just kill me now' [desperate tone]. Every year it's like the same presentation. Every year, like the exact same lines, it's just annoying" (p. 22).

Data from the Statistics Canada General Social Survey (obtained through the Data Liberation Initiative) show that the lifetime prevalence of cyber-victimization in 15 to 19 year olds who are enrolled full-time in secondary education is lowest in Quebec, but similar between the other provinces (see Table 17, p. 67). The second phase of the *Young Canadians in a Wired World* Survey[96] noted that the prevalence of bullying was similar between provinces outside of Quebec, but pointed to the "remarkable" difference in prevalence between Quebec and the other provinces, commenting:

> This implies either that the incidence of bullying is much lower in Quebec than elsewhere or that there is a cultural difference in the way bullying is defined. Such a difference might arise from the ways in which parents and the educational systems in Quebec and elsewhere treat the issue (p. 83).

The *L' Enquête Québécoise Sur La Santé Des Jeunes Du Secondaire*[106]*,* a large-scale survey of high school students across Quebec, also found a very low prevalence of cyber-victimization in the past school year since September (7%); however, the reference

period could have been as short as 2 months for some students (on account of surveying being conducted from November through May).

Another notable feature of Table 17 is that the gender difference in cyber-victimization is highest in Atlantic Canada, and lowest in Quebec and in British Columbia.

Table 17. Lifetime prevalence of cyber-victimization by region from the 2009 GSS

Region	Female	Male	Total	Δ (F-M)
Atlantic Canada	29%	11%	20%	18%
Quebec	14%	10%	12%	4%
Ontario	23%	12%	18%	11%
Prairies	27%	14%	21%	13%
BC	23%	21%	22%	2%

CHAPTER 5: RESULTS FOR PERPETRATION

Prevalence of Cyberbullying

Consult Appendix G (p. 166) for detailed descriptions of sampling and measurement in included studies that measured the prevalence of cyberbullying perpetration.

Perpetration of electronic bullying: 1 to 3 months. See Table 6 (p. 166) for the studies described in this section. Three studies measured cyberbullying in the past month using the *Safe School Survey* (SSS), which provides a good-quality definition of 'bullying'. As with the prevalence rates observed for victimization, the prevalence rates observed for perpetration measured with the *SSS* were low despite considerable differences between the samples. The overall prevalence of perpetration was 8% in a large cross-national sample of grade 4 to 12 students taken by the CPHA in 2003[117]; this breaks down to 6% in grade 4 to 7 students and 10% in grade 8 to 12 students. The former value can be compared to Wong's[119] estimate of 7% perpetration in grade 6 to 7 students in a non-representative sample with a low response rate from Toronto in 2009, and a 6% perpetration rate from research on grade 4 to 7s in the Waterloo Catholic District School Board[85] in 2010.

Cappadocia[35] and Vaillancourt et al.[87] used items from the *World Health Organization Health Behaviours in School-Aged Children Survey* (WHO-HBSC) that are similar to the SSS, although Cappadocia[35] measured prevalence over the past 2 months with grade 9 to 12 students across Canada in 2006 and 2007, and Vaillancourt et al.[87] measured prevalence over the past 3 months in grade 4 to 12 students in Southern Ontario in 2005. Cappadocia[35] reported 7% perpetration in both 2006 and 2007, whereas Vaillancourt et al.[87] reported 10% perpetration. Murphy[92] also used the *WHO-HSBC*

measure (with a 2-month prevalence period), but with small non-representative sample of 80 grade 9 to 10 students from one school in Ontario with a high proportion of excluded data. This yielded a much higher perpetration rate of 28%.

As described in the section on victimization, Stanton's[91] survey research on cyberbullying featured a conflict between the definition of bullying provided in the section header and the wording of the actual questionnaire item. The survey posted on the *Kids Help Phone* website yielded 12% perpetration in the past 3 months by 10 to 17 year old Canadians, while the sample recruited by the professional research company only reported 2% perpetration with the same age group, item, and reference period.

Two studies that measured cyberbullying without specifying any of the definitional components, both using school-based convenience samples with poor response rates, reported 9% (Toronto sample[73]) and 5% (francophone BC sample[98]) perpetration.

In summary, results for measures of online bullying perpetration in the past 1 to 3 months using similar measures were quite consistent, averaging about 8% despite some variation in the quality of definitions and samples. However, a couple of studies demonstrated the inflating effect of non-representative samples on prevalence rates. A report by Murphy[92], which used a small sample from one school, reported a considerably higher prevalence estimate of 28%. A report by Stanton[91], which used the same measure in two different samples, demonstrated that the *Kids Help Phone* sample yielded inflated prevalence rates.

Perpetration of electronic aggression: 1 to 3 months. See Table 7 (p. 173) for the studies discussed in this section. Three studies[32,73,74] measured involvement with negative online behaviours.

In a school-based convenience sample from one high school in southern Ontario, Blais[32] found that 25% of respondents were perpetrators of 'mean' behaviours online or via text message in the past month.

Mishna et al.[73] and Wade and Beran[74] both used the same measure of 6 forms of negative online behaviour (e.g., name-calling, threats, rumour-spreading, impersonation), both with grade 6, 7, 10, and 11 students recruited from school-based convenience samples with low response rates. The Toronto sample[73] yielded a perpetration rate of 34%, while the Calgary sample[74] yielded a perpetration rate of 30%. It is useful to compare the 34% prevalence rate found by Mishna et al. [73] with another item used with the same subjects; a global cyberbullying item, which the authors did not analyze, produced a prevalence rate of only 9% perpetration.

In summary, measures of perpetration of electronic aggression in the past 3 months yielded higher prevalence rates (25% to 34%) than did studies that measured electronic bullying. In addition to the use of a more loosely-defined construct, other reasons could be that 1) the studies computed prevalence as the proportion of students who engaged in at least one of a number of behaviours, rather than by asking a single global item, and 2) the samples were also of lower quality.

Perpetration of electronic bullying: ≤12 months. See Table 8 (p. 175) for the studies discussed in this section. Studies measuring the prevalence of electronic bullying perpetration with periods up to one year produced a wide range of prevalence rates (2% to 26%).

The lowest prevalence rate was reported in internal school board research describing a single Catholic elementary school in Toronto with a sample of 92 grade 4 to

7 students[121]. When asking about victimization, the school safety survey defined internet bullying with negative actions ("Bullying occurs when a person is hurt by the actions of others") and provided 6 examples of sources, which yielded a prevalence rate of 13%. However, the item for perpetration (found on another page) did not repeat the definition or examples; rather, it simply presented a global prompt for cyberbullying ("In what ways have you bullied others? Physically/verbal/social/cyber"). This yielded a very low prevalence rate of 2%. This difference in the elaboration of the items for victimization and perpetration may account for the relatively large gap between the prevalence rates, which are otherwise highly correlated (see p. 88).

Using a school-based convenience sample with a good response rate from one school in BC, Bonanno and Hymel[99] provided a full definition of bullying in the past school year with 12 examples of sources or behaviours, yielding a perpetration rate of 11%. However, the date of survey administration was not reported, meaning that the exact prevalence period is unknown and could lie anywhere up to 10 months.

The *BC Safe Schools and Social Responsibility Survey* measured cyberbullying in a large sample of students from one school district in urban BC, using a definition that specified all 3 criteria; the grade 8 to 12 version of the survey was further confirmed to specify 5 examples of sources or behaviours. The grade 4 to 7 version (reported by Trach et al.[83]) found 7% perpetration, while the grade 8 to 12 version (reported by Buchanan[84]) found a higher prevalence of 25%. The prevalence periods ranged from 4 to 8 months.

Stys[93] measured electronic bullying in a school-based convenience sample with a very low response rate. The sample was located in rural eastern Ontario in 2004, and the prevalence period was 8 to 9 months. Stys used two different measures in the same sample,

a variant of the *SSS* and the *EBQ* (Electronic Bullying Questionnaire). The *EBQ* measured prevalence with 6 separate items (representing one source each). The six-item *EBQ* yielded a much higher prevalence rate for perpetration (34%) than did the global electronic bullying item from the *SSS* (13%), even though it technically assessed fewer sources/behaviours (7 vs. 10).

The highest prevalence value in this group was reported by Cassidy et al.[94], who found that 26% of the sample admitted to cyberbullying others. It is notable that the prevalence rate for perpetration was higher than the prevalence rate for victimization in this sample (victimization rates are consistently higher than perpetration rates within samples; see p. 88). This could be attributed to the fact that while neither item defined cyberbullying, the victimization measure did not specify any sources or behaviours, whereas the perpetration measure specified one behaviour (harassment) and four sources (chat room, e-mail, text messaging, and online discussion).

In summary, surveys assessing perpetration of electronic bullying in the past ≤12 months showed a considerable range of prevalence estimates (2% to 34%). The lowest estimate was associated with internal school board research from one elementary school that measured cyberbullying with a simple global measure[102]. Results from a large-scale school climate survey of one school district in BC (with a global item based on a full definition) found 7% perpetration in grade 4 to 7 students[83] and 25% perpetration in grade 8 to 12 students[84]. The difference between the rates reflects a grade effect, because the measures were the same, and the samples were taken from the same district as part of the same project.

Results from school-based convenience samples ranged from 11% in a survey with

a high response rate[99] to 26% to 34% in samples with low response rates[93,95]. Research from Stys[93] showed that using a checklist-style approach increased prevalence. The shorter, global measure (based on the *SSS*) yielded a prevalence rate of 13%, while the measure that assessed prevalence as the proportion of students who answered 'yes' to at least one of six separate items produced a prevalence rate of 34%, even though both measures used the same definition of 'electronic bullying' with the same subjects.

Perpetration of electronic aggression: ≤12 months. See Table 9 (p. 182) for the studies discussed in this section. Two studies[111,112] measured the perpetration of electronic aggression with prevalence periods up to one year. Data collected from a large sample of high school students in south-western Ontario[111] found that 21% had perpetrated at least one of 4 types of online aggression (forwarding private material, rumour-spreading, making threats, and posting inappropriate material) in the past 6 to 7 months. Using a smaller school-based convenience sample of grade 7 to 8 students in Northeastern Ontario, Pettalia[112] found that 49% had perpetrated at least one of 6 types of online aggression (impersonation, denigration, outing/trickery, exclusion, harassment, or stalking) in the past 4 to 8 months.

In summary, Pettalia[112] found more than twice the prevalence of perpetration than Pandori[111], this could be attributed by the use of a smaller, more biased sample, and the estimation of prevalence based on affirmative responses to 1 of 6 items rather than 1 of 4 items.

Perpetration of electronic bullying: Lifetime. See Table 10 (p. 185) for the studies discussed in this section. Lifetime prevalence rates for electronic bullying showed the greatest range of values: 10%[104] to 44%[86].

The lowest value, 10%, comes from the Nova Scotia Bullying and Cyberbullying Task Force's online convenience sample of youth in the province[104]. The survey had a fairly robust definition of cyberbullying with 4 examples of sources. The Task Force's focus groups[116], which prompted group discussion of the characteristics of cyberbullying, produced a higher prevalence estimate (19%)[116], though a further 9% indicated they were not sure if they had cyberbullied others.

Hinduja and Patchin collected data from online convenience surveys in 2004 and 2005. Cyberbullying was defined as behaviour that could include 6 online negative behaviours (e.g., bothering someone, name-calling, exclusion). The prevalence rate for the Canadian subsample (n = 46) associated with the 2006 report[124], for which the original sample was 85% female, was 20%. The next online sample[105] attempted to control for the gender gap by randomly reducing the number of female participants to match the number of males. The Canadian subsample (n = 365) for this study yielded a prevalence rate of 14%.

In a 2004 convenience sample of grade 7 to 9 students from 3 middle schools in Calgary, Li[38] found a perpetration rate of 17% measuring cyberbullying with no definition, only 3 sources, and no behaviours. In a similar but larger sample recruited from 9 Calgary middle schools (likely around the same time frame), Beran and Li[47] found a perpetration rate of 26%; this time, the definition of 'harassment using technology' included all 3 bullying elements of intent, repetition, and power, and a total of 13 sources and behaviours were specified as examples. As with the victimization measure, it is interesting to note that in 2005, Beran and Li[123] reported only 3% perpetration with the same sample, again demonstrating the dramatic effect of truncating prevalence estimates through a frequency

cut-point (in this case, three or more times in a lifetime period).

Cochrane[101] and Pisch[113] measured cyberbullying in non-representative school-based convenience samples from Saskatchewan middle and high schools, respectively. Both used similar measures that were ultimately derived from Beran and Li[123], but specified more examples of cyberbullying. Cochrane reported 35% perpetration in grade 7 to 9 students, and Pisch[113] reported a 32% in grade 11 to 12 students.

The prevalence of perpetration in McLean[108], who used a school-based convenience sample of 448 grade 9 to 12 students, was slightly higher than the prevalence of victimization (28% vs. 27%), which is atypical (see p. 88). The rates were based on items that did not have parallel wording. The victimization item had a peculiar list of response options for the question 'Have you ever been bullied or threatened by someone in any of the follow ways" [*sic*] that was not mutually exclusive: 'digital bullying', 'via text messages', 'in internet chat rooms', 'via email', 'via websites', 'I have not been cyberbullied'. The prevalence of victimization was calculated as the reverse of the proportion of students who endorsed the final option (100% - 73% = 27%). The item assessing perpetration was much more straightforward, with a simple yes/no response option: "Have you ever sent a threatening or bullying message to someone else".

The highest prevalence values in this group, 44% comes from a 2007 report for *Kids Help Phone*[86], which recruited a non-representative sample of youth who were seeking help with personal problems anonymously; the users were predominantly from middle school (54%) and female (74%). The definition of cyberbullying only emphasized negative behaviours, and listed up to 12 sources or behaviours as examples.

In summary, estimates of the lifetime prevalence of electronic bullying yielded a

large range of estimates (10% to 44%), but these can be broken down into subgroups. Research conducted in collaboration with school boards in Nova Scotia found the lowest prevalence rates (10% and 19%)[104,116]. Estimates of cyberbullying perpetration taken from school-based convenience samples recruited by academics fell in the range of 17% to 35%, with studies giving the most elaborate definitions or descriptions falling at the higher end of the range (25% to 35%). The highest prevalence rate (44%) was produced by a survey[86] posted on the *Kids Help Phone* website.

Perpetration of electronic aggression: Lifetime. See Table 11 (p. 192) for the studies discussed in this section. Four studies[88,103,109,118] investigated online aggression with lifetime prevalence rates. Using a cross-national panel of 300 8 to 17 year olds, Microsoft[109] found that 20% engaged in 'mean' behaviours on the internet. The third phase of the *Young Canadians in a Wired World* survey reported a very similar value of 23% perpetration by 'mean and cruel online behaviours' from a large cross-national sample collected in 2013. The *YCWW* survey also included a separate item on making threats, which yielded a 9% prevalence rate.

While Gomez-Garibello et al.[103] found a very high prevalence of victimization (65%) using a measure of 16 negative online experiences, the perpetration rate was much lower (11%); generally, one would expect the prevalence of perpetration to be only about two-thirds the prevalence of victimization (see p. 88). Without access to the survey, it is difficult to determine why this might be so. The one item shared from the survey by the author ("Have you received a threatening message from another student that made you afraid?") was in fact one of the items in the survey used by Jackson et al.[95] (which had 20 items). Jackson et al[95] measured prevalence in the past year and reported perpetration based

on responses to a single global item that did not include a definition of cyberbullying. It is not clear if Gomez-Garibello et al.[103] assessed prevalence in that manner.

The highest prevalence rate in this group was reported by Van Ingen[118], who surveyed 134 Edmonton grade 7 to 9 students in a school-based convenience sample. She found that 56% responded affirmatively to one of 16 items in a cyberbullying questionnaire that described a total of 10 behaviours and 6 electronic sources.

In summary, two studies based on global items with large, representative samples[88,109] found consistent estimates of 20% and 23% for perpetration of electronic aggression, which are higher than the prevalence rates observed in studies measuring electronic bullying with the most representative samples. The highest prevalence rate in this group (56%) was associated with a small school-based convenience sample that calculated prevalence as the proportion of students who had at least 1 of 16 experiences[118]. It is unclear why another study[103] (which suffered from very poor reporting) found only 11% perpetration in another small, non-representative sample when using a similar measure; it is possible that the prevalence of perpetration was actually assessed with a simple global item.

Frequency of Cyberbullying Perpetration

Nineteen studies provided information about the frequency of cyberbullying (see Table 13, p. 194). The general distribution of responses for perpetration showed even more positive skew than did victimization. Eleven studies used Likert-scale measures of frequency. While the scaling was heterogeneous, with the lowest category representing values from ‘once or twice’ up to ‘almost every day’ in varying reference periods, a median of 72% of participants endorsed the response scale item that represented the lowest

frequency of perpetration. As with victimization, this value was higher (77%) for studies that measured prevalence periods of 12 months or less, and lower (60%) for studies measuring lifetime prevalence. Typically no more than 2% of respondents endorsed the highest (most frequent) response scale option; the highest values (of 4% to 8%) were all associated with lifetime prevalence estimates.

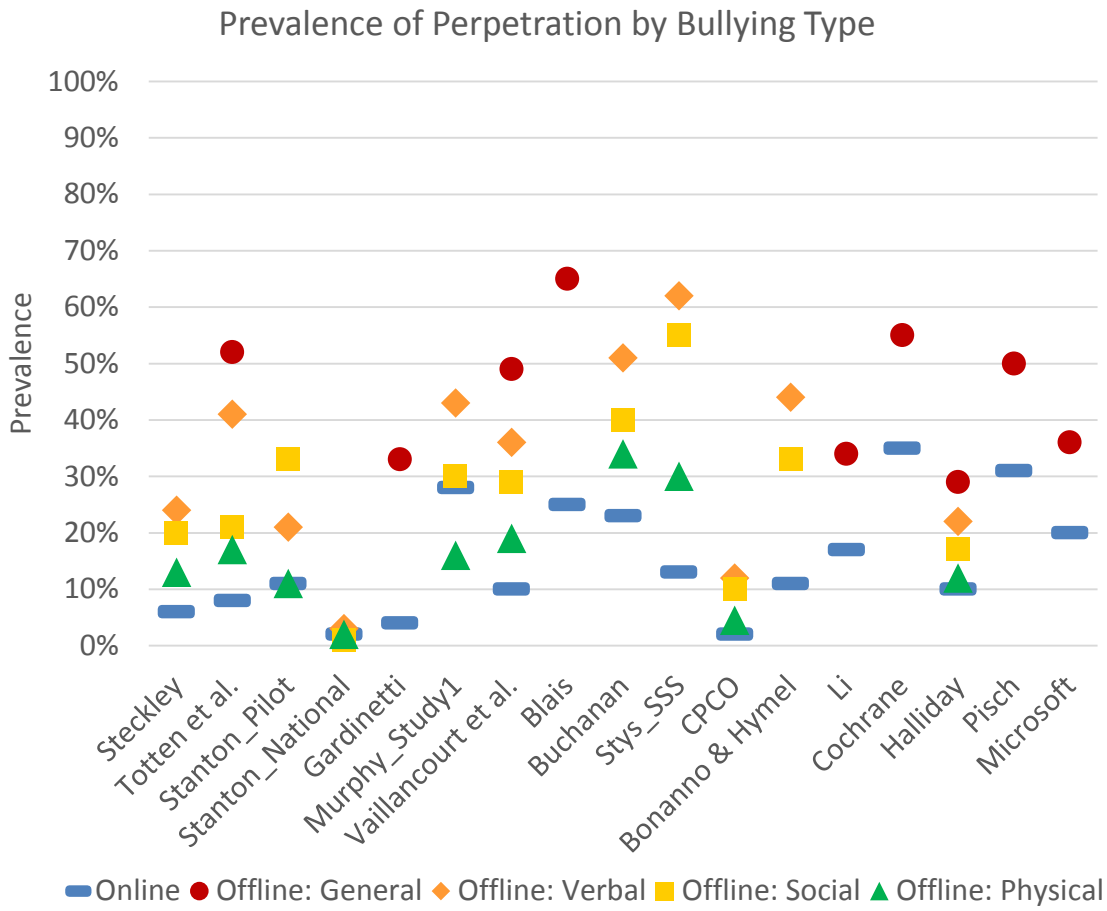
Three studies provided item means based on 4- or 5-point Likert scales; as was observed with victimization, these fell between the first two scale points (e.g., 'never' and 'rarely').

Several studies did not give an overall breakdown of prevalence by frequency, but instead presented frequency distributions for each item in a set of questions. I calculated the weighted average proportion of students who endorsed each scale level (across all items). Overall, most students (79% to 90%) answered each item with 'never', and a small minority (1% to 4%) selected the response option that represented the highest frequency of perpetration.

Comparison of Online vs. Offline Perpetration

There were 17 estimates of *online* perpetration with corresponding measures of *offline* perpetration (see right side of Table 14, Appendix H, p. 199). As demonstrated in Figure 16, the typical pattern was that perpetration of general bullying has the highest prevalence, followed by verbal, social, and physical bullying, and last, cyberbullying. This pattern closely paralleled that observed for the relationship between online and offline victimization (Figure 8, p. 54).

Figure 16. Online vs. offline bullying perpetration



Based on 9 comparisons, the median ratio of cyberbullying to general bullying perpetration ($\hat{p}_{CP}/\hat{p}_{GP}$) was 38%, indicating that the prevalence of cyberbullying was just above one third the prevalence of general bullying. These values were also highly correlated ($r = 0.53$; $n = 9$). 'General' perpetration was not specific to any one type of bullying (e.g., 'Have you bullied others?'). Note that responses to such global items are typically lower than those calculated based on responses to a number of specific items. For example, Vaillancourt et al.[87] reported that 32% of participants indicated they were perpetrators according to a single global item, but this value is lower than the combined percentage of students who indicated that they had bullied verbally, socially, physically, or electronically (49%).

In 11 cases, online bullying could be compared to specific forms of offline perpetration. The median ratio of cyberbullying to verbal bullying ($\hat{p}_{CP}/\hat{p}_{VP}$) was 28%, indicating that the prevalence of cyberbullying was just above one quarter the prevalence of verbal bullying. These values were also highly correlated (r = 0.65; n = 11).

The median ratio of cyberbullying to social bullying ($\hat{p}_{CP}/\hat{p}_{SP}$) was 34%, indicating that the prevalence of cyberbullying was about one third the prevalence of social bullying. These values were also highly correlated (r = 0.59; n = 11).

The median ratio of cyberbullying to physical bullying ($\hat{p}_{CP}/\hat{p}_{PP}$) was 34%, indicating that the prevalence of cyberbullying was about one third the prevalence of social bullying. These values were also highly correlated (r = 0.64; n = 10). The association with physical bullying was over twice the magnitude of that observed for cyber-victimization and physical victimization ($r = 0.28$).

Prevalence of Cyberbullying Perpetration by Sex

There were 28 prevalence estimates that provided information about sex differences in perpetration (see Table 15, Appendix H, p. 200, and Figure 17, p. 82). Eighteen percent (n = 5) reported that females were significantly more likely than males to perpetrate, 14% (n = 4) reported that males were significantly more likely to perpetrate than females, and 68% (n = 19) found no significant difference in prevalence between males and females. Among those studies that reported null results, 47% (n = 9) trended in the direction of higher prevalence in females, 21% (n = 4) trended in the direction of higher prevalence in males, and 32% (n = 6) did not include information about the direction of the difference.

Odds ratios could be calculated for 27 estimates (see Figure 18, p. 83); however, in five cases[47,73,74,117,118] the odds ratios were estimated assuming equal prevalence for males

and females, because the authors reported that there was no statistically significant sex difference in prevalence without reporting the percentage of perpetrators of each sex.

Sex differences in the prevalence of perpetration tended to be smaller than those observed for victimization. The median of absolute proportion differences was only 1% (in the direction of higher female perpetration), and the median ratio of female to male perpetration ($\hat{p}_F/\hat{p}_M$) was 1.04 (indicating almost equal prevalence between the sexes). Odds ratios ranged from 0.31 to 2.0 (where values above one represent higher perpetration in females compared to males) with a median of 1.07. Magnitudes of Cohen's *d* for statistically significant differences ranged from 0.06 to 0.59 (very small to medium), with a median of 0.3 (small). Magnitudes of Cohen's *d* for all 27 estimates yielded a smaller median of 0.21 (small). Values for r^2 for statistically significant differences ranged from 0.1% to 8%, with a median of 2.2% (small). Values for r^2 for all 27 estimates yielded a smaller median of 1% (small). Forty-four percent of these r^2 values (n = 12) fell below 1% (very small), and 56% (n = 15) fell between 1% and 9% (small).

Figure 17. Prevalence of cyberbullying perpetration by sex

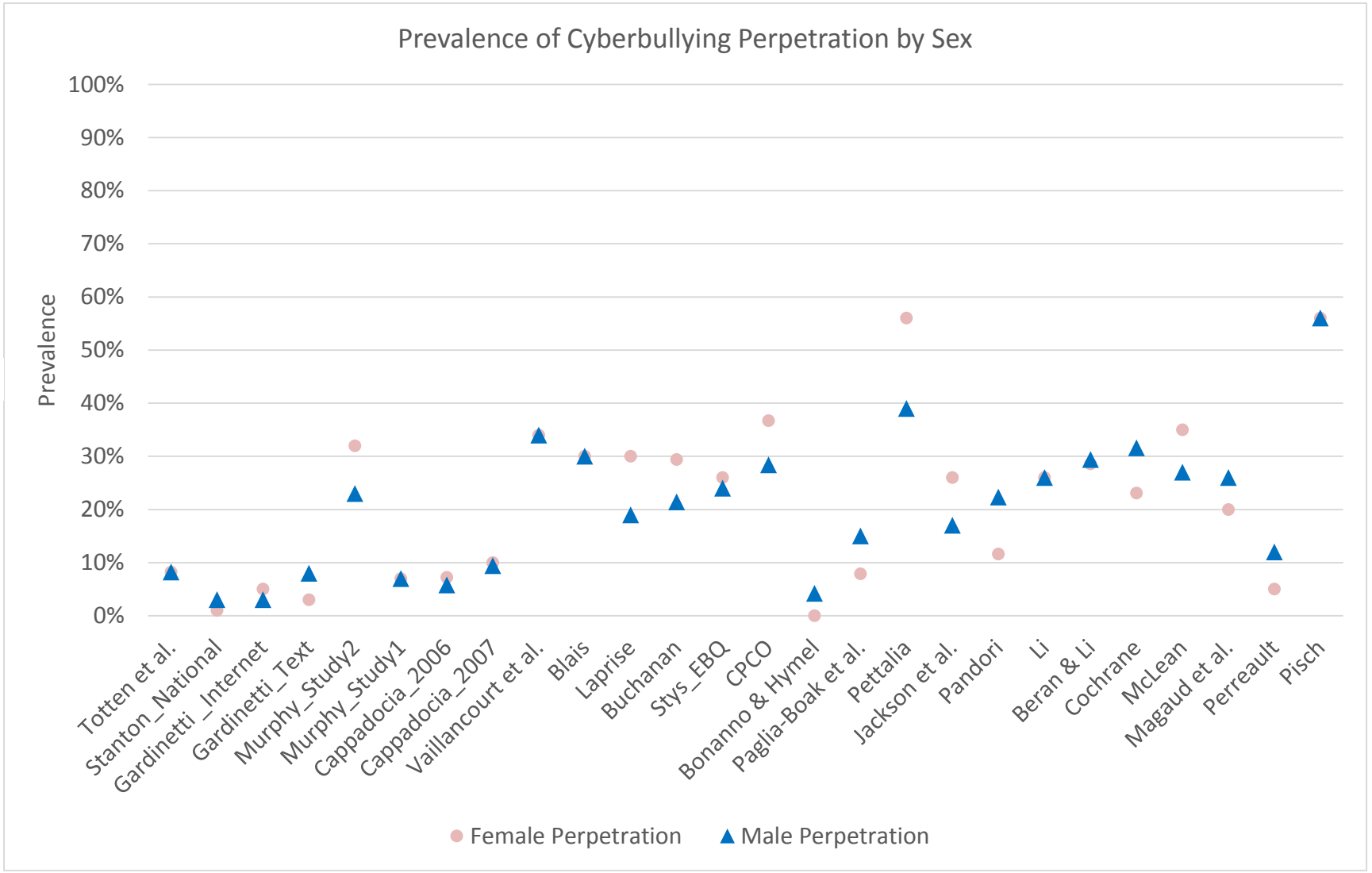
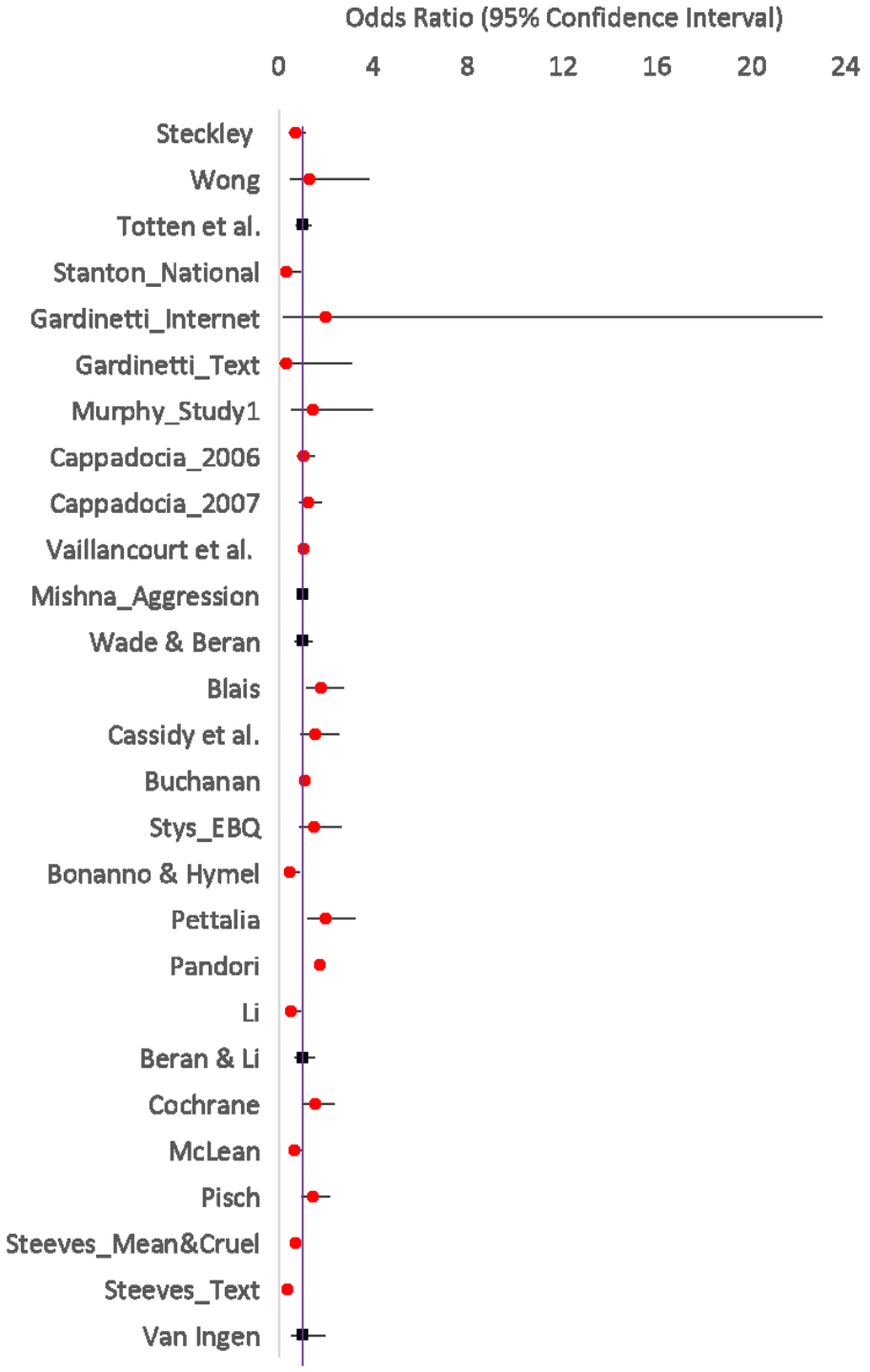


Figure 18. Odds ratios for sex differences in cyberbullying perpetration

The five values represented by black squares (odds ratios assumed to be 1) were estimated from studies with results that were not statistically significant. Odds ratios above 1 indicate greater female perpetration.



Prevalence of Cyberbullying Perpetration by Grade/Age

Twenty-one perpetration estimates provided information about grade or age differences; see right side of Table 16, Appendix H, p. 208. Note again that this section discusses the relationship between prevalence and age/grade using different subjects across grades; i.e., the comparisons are based on cross-sectional rather than longitudinal data.

≤12 Month period prevalence. The relationship between perpetration and age was similar to the relationship between victimization and age: prevalence increased until around late middle school and then leveled off or decreased. There were 14 prevalence estimates with reference periods up to 12 months (inclusive). Six of these comparisons (43%) found no significant grade/age effect; one (Wong[119]) used a very restricted age range (grades 6 to 7) and the remainder featured older students: grades 9 to 12 in Blais[32], grades 9 to 11 and 10 to 12 in Cappadocia[34], grades 9 to 10 in Stys[93], and grades 8 to 10 in Bonanno & Hymel[99]. Although Stanton[91] used a broader age range, with students aged 10 to 17, she used a frequency cut point that resulted in a very low overall prevalence rate (2% in the national sample). This could make age effects hard to discern, or even change their quality (i.e., perhaps being *frequently* bullied is a condition subject to different age effects than being occasionally bullied).

Steckley[85] showed that prevalence increased from grade 4 to 7, increasing from 2% in grade 4 students to 11% in grade 6 students. Using the same measure, a study by the Canadian Public Health Association[117] found higher perpetration in grade 8 to 12 students (10%) compared to grade 4 to 7 students (6%), and also noted that 88% of cyberbullying (victimization and perpetration) occurred from grade 8 to 10 (approximately ages 12 to 16). Cassidy et al[94], commenting on data published by Jackson et al[95], found that

perpetration peaked in students aged 12 to 14 (25%), increasing from 17% in students aged 11, and decreasing back to 19% in students aged 15. In grade 6, 7, 8, and 9 students, Wade and Beran[74] found that grade 7 students were more likely to be perpetrators than grade 6 or 11 students for three of six types of negative online behaviours.

A large-scale survey of students from Southern Ontario by Vaillancourt et al.[127] also showed a curvilinear relationship between prevalence and grade, increasing from 7% in grade 4 and 5 students, peaking at 13% in grade 9 and 10 students, and then decreasing to 11% in grade 11 and 12 students (see Figure 19). Data from a large-scale survey reported by Buchanan[84] found a similar relationship in grade 8 to 12 students (see Figure 20 , p. 86), with perpetration increasing from 23% in grade 8, peaking in grade 9 to 10, and decreasing to the lowest prevalence value of 22% in grade 12.

Figure 19. 3-month prevalence of cyberbullying perpetration by grade in Vaillancourt et al. (2013)

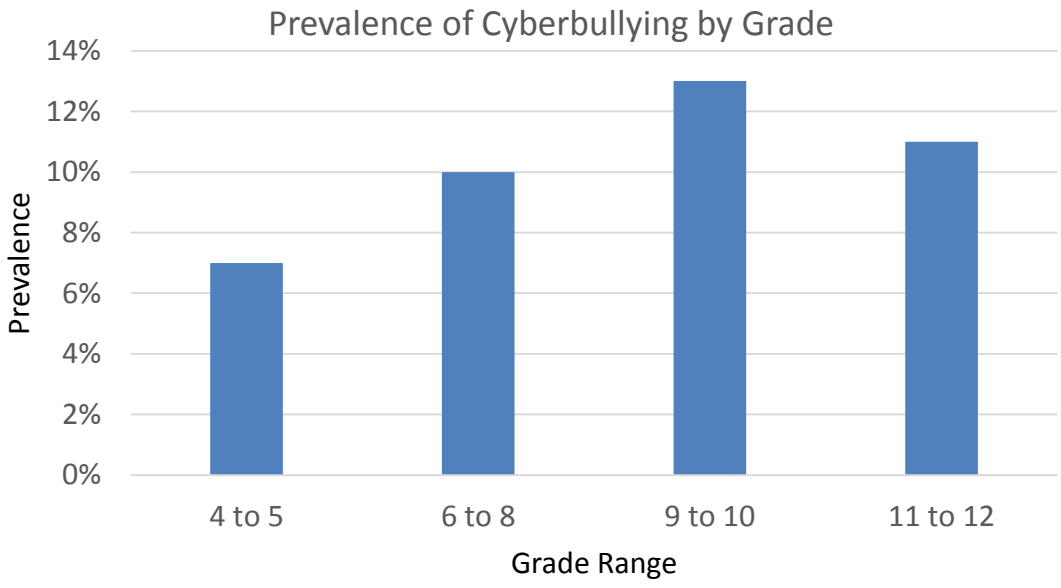
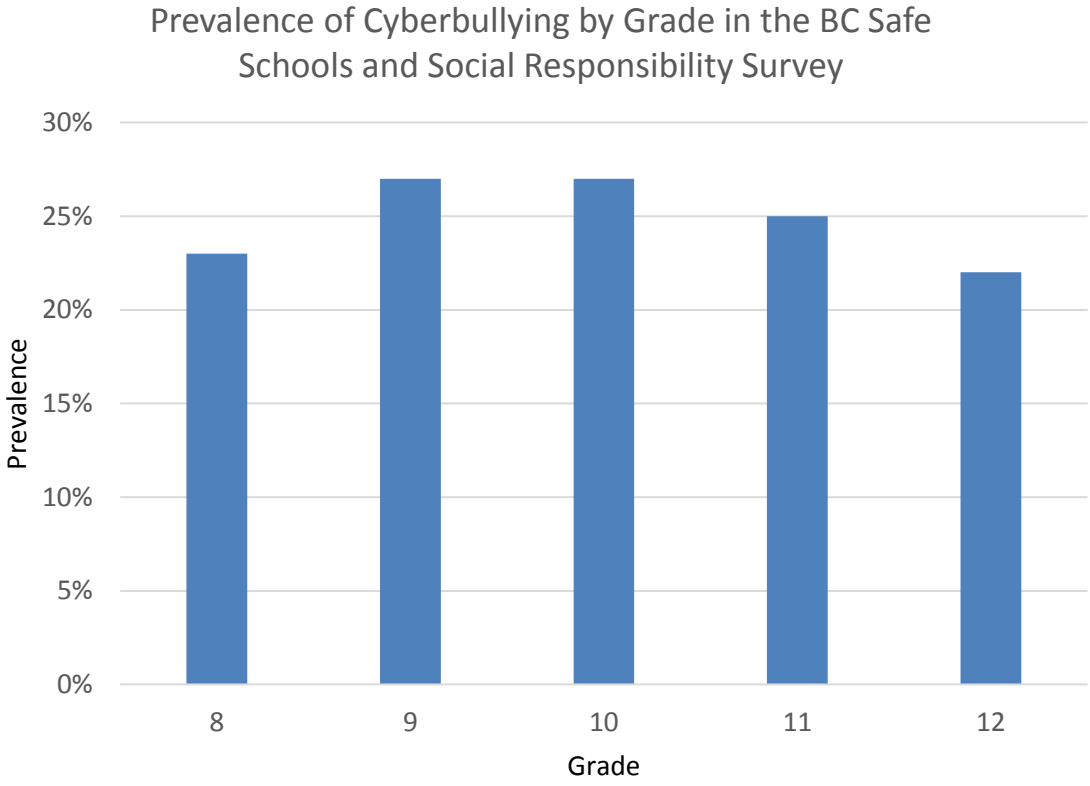


Figure 20. 4-to-8-month prevalence of cyberbullying perpetration by grade in Buchanan (2012)



Lifetime period prevalence. Six estimates of perpetration provided information about grade or age differences; three of these did not detect significant grade effects. Two of these studies did not provide a breakdown of prevalence rates by age: Magaud et al.[107] (who did not report the subjects' age range), and Van Ingen[118] (who studied grade 7 to 9 students). Pisch[113], who did not detect a statistically-significant age effect, nevertheless showed an increasing trend in prevalence, from 28% in grade 11 students to 32% in grade 12 students.

Results from Cochrane[101] showed that prevalence increased from grade 7 to 8 (an absolute difference of 9%), and from grade 8 to 9 (an absolute difference of 16%). Using the full grade range, Stadey[116] showed a larger increase from elementary to middle school

(an absolute difference of 15%) than from middle to high school (8%).

The *Young Canadians in a Wired World (Phase III) Survey*[88] provided more detailed information on prevalence by grade from grades 4 to 11. The relationships for both the measures of perpetration of 'mean and cruel behaviour' and 'threats' (see Figure 21 and Figure 22, p. 88) show increase through the elementary and middle school years, and a slowing or levelling off in high school. This suggests that the incidence of cyberbullying perpetration is low in high school compared to elementary and middle school, a pattern that was also observed for victimization.

Overall, the effects of age on the prevalence of cyberbullying perpetration are small. Effect sizes for statistically significant differences were characterized as very small or small. The largest effect size was an r^2 value of 4.8%, found in Cochrane[101].

Figure 21. Lifetime perpetration of mean & cruel behaviours by grade in Steeves (2014)

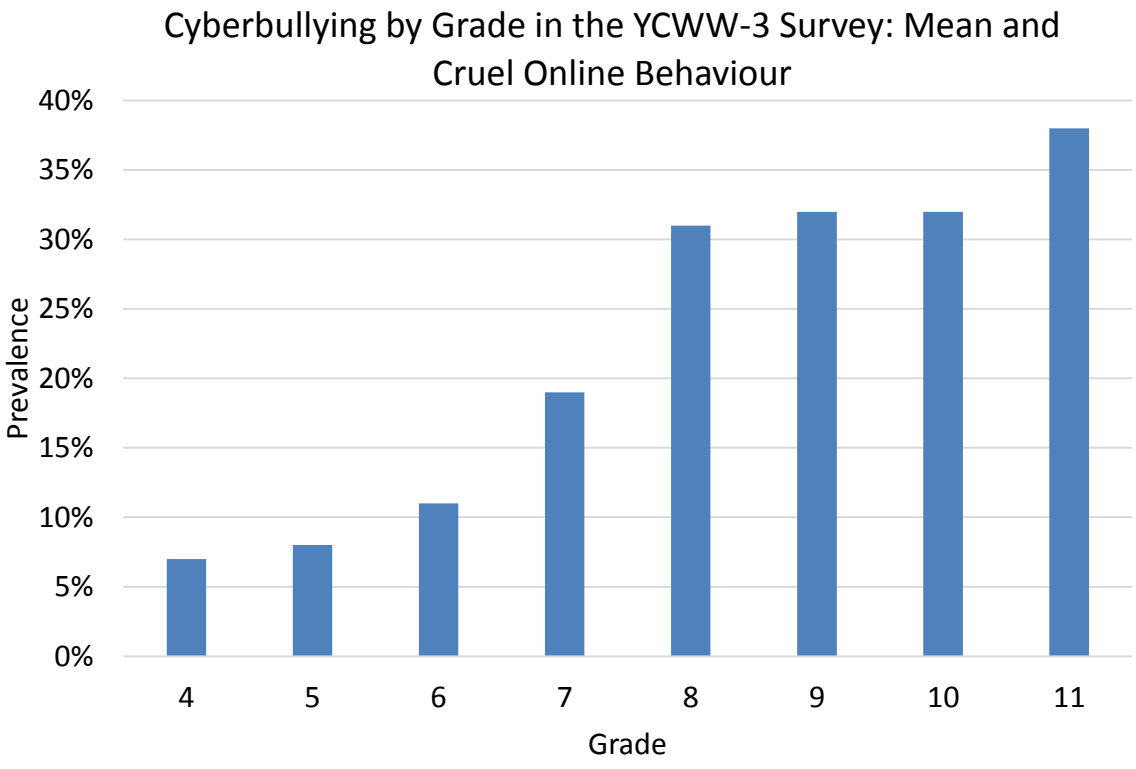
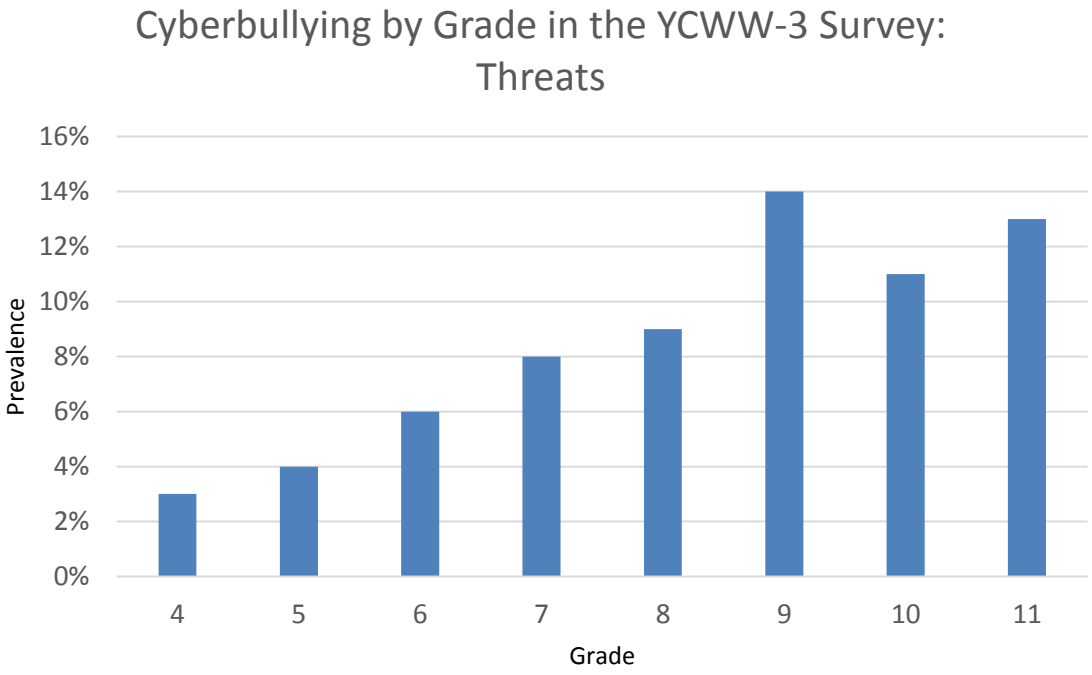


Figure 22. Lifetime perpetration of threats by grade in Steeves (2014)



Comparison of Perpetration with Victimization

There were 36 comparable measures of victimization and perpetration from the same samples (note that Cassidy et al.[94] was excluded from this calculation because their measures of victimization and perpetration were too disparate).

The prevalence of victimization and perpetration is highly correlated within samples ($r = 0.76$). The median ratio of victims to perpetrators ($\hat{p}_V / \hat{p}_P$) was 1.47, indicating that victimization was more prevalent than perpetration. The corollary is that the median ratio of perpetrators to victims ($\hat{p}_P / \hat{p}_V$) was 0.68.

CHAPTER 6: DISCUSSION

The Scope of the Problem

The alarmingly high prevalence rates presented to the public (in media reports and by activists) tend to reflect measurements of negative experiences and aggression rather than bullying, non-representative sampling, infrequent events occurring over very long periods, or a combination of these factors. For example, the highest victimization rate (70%)[86] comes from a study that measured lifetime cyber-victimization with a liberal definition in an online convenience sample recruited from a counselling website.

The best available estimates of cyberbullying prevalence come from studies judged to be at lower risk of bias that use good definitions of bullying in precise reference periods of about two months[128]. Studies using ≤3 month reference periods that were judged to be at lower (i.e., moderate) risk of bias and that also used careful definitions of bullying are summarized in Table 18 (p. 90). The values in Table 18 all hover around 10% victimization and 8% perpetration in the past 1 to 3 months.

Vaillancourt et al.'s[87] 2005 research stands apart as having the best sampling procedures and survey methods; however, the sample is localized to students from one region in Southern Ontario ten years ago. Totten et al. [117] used a cross-national sample, but the data, collected in 2003, is also out of date. One could expect prevalence to have increased since 2003 simply due to the greater market penetration of devices such as smartphones over the past 12 years; research from the USA tied cyberbullying prevalence to access to technology (independently of increases in age) over the 2006 to 2008 period[72].

While Cappadocia's[34] sample, taken from Canadian responses to the World Health Organization's *Health Behaviours in School-Aged Children Survey* featured participants

from across the country, she used a sample of respondents who had completed the survey in both years. This brings up the question of whether or not participants who completed the survey (which used an active consent procedure) twice are different from other students in a way that would confound the prevalence estimate. This is possible, given that active consent procedures invoke volunteer bias.

Table 18. The most reliable Canadian estimates of cyberbullying prevalence

Study	**Year**	**Description**	**Victimization** Rate & reference period	**Perpetration** Rate & reference period
Totten et al.[117] *Grade 4-12*	2003	1795 grade 4-12 (no grade 5) students from 7 sites (MB, QC, NB, ON) with a mix of rural and urban subjects and schools with and without bullying programs.	9% 1 month	8% 1 month
Steckley[85] *Grade 4-7*	2010	1105 grade 4-7 students from 10 elementary schools in the Waterloo Catholic District School Board 3 years after implementation of an antibullying program	12% 1 month	6% 1 month
Cappadocia[34]a (2006 data) *Grade 9-11*	2006	Subsample of 1972 grade 9-11/10-12 students across Canada who completed the WHO-HBSC survey both years.	7% 2 months	7% 2 months
Cappadocia[34] (2007 data) *Grade 10-12*	2007		8% 2 months	7% 2 months
Vaillancourt et al.[87] *Grade 4-11*	2005	16,799 grade 4-12 students from Southern Ontario	12% 3 months	10% 3 months

General findings. This review noted a number of general trends in cyberbullying prevalence. Victimization is consistently more prevalent than perpetration (by a factor of 1.5), which may indicate that perpetrators target multiple victims (or that respondents under-report perpetration, perhaps due to self-serving biases[69]). Offline bullying is more

prevalent than online bullying and the two phenomena are highly correlated (with the exception of cyber-victimization and physical victimization, which nevertheless share an association of $r = 0.28$ that borders on a medium effect size).

Even a low prevalence of cyberbullying is unacceptable if it is associated with major negative outcomes such as suicide, the subject that is at the root of public concern about cyberbullying. Indeed, the *BC Adolescent Health Survey* found that while 9% of students who were not cyberbullied in the last year seriously considered suicide, this rose to 20% in those cyberbullied only once and to 31% in those cyberbullied two or more times. Anti-cyberbullying efforts should focus on, or at least have individual-level interventions for, the small percentage of students who are frequently involved. This is particularly important for perpetration, as there are likely several victims for one perpetrator. The strong correlation between online and offline bullying suggests that interventions that target offline bullying will generalize to online bullying. Nevertheless, anti-bullying programs should include a component (ideally evidence-based) that focuses on cyberbullying.

Media reports have claimed that cyberbullying is 'epidemic' in Canada[23]. It is difficult to assess change in prevalence over time across multiple studies because many factors vary between studies besides year of data collection; for example, quality of sampling and measures, age and location of subjects, and length of reference period.

The first prevalence rates were collected in 2003 by the Canadian Public Health Association[117], which found 5% victimization and 6% perpetration in the previous month among grade 4 to 7 students across Canada. Using the same measure with grade 4 to 7 students in Waterloo, Ontario in 2010, Steckley[85] found 12% victimization and 6% perpetration. However, the differences in prevalence between the studies can also be

attributed to regional trends, or to the fact that the schools featured by Steckley[85] were in the post-test phase of an anti-bullying intervention. Schools with anti-bullying programs have higher rates of bullying[129], perhaps because schools with more bullying are more motivated to seek interventions, or because increased awareness leads to increased reporting.

Data collection by Microsoft[109] using household panels found a 40% lifetime prevalence of cyber-victimization in 2012. Research by Microsoft in 2009 also found a 40% lifetime prevalence rate, which had increased from 25% in 2004. However, the information about the 2009 and 2004 studies comes from a press release[125], and I was not able to obtain the original reports. Therefore, I cannot be certain that the three studies used the same methods.

An annual survey of grade 9 to 12 students in the Toronto Catholic District School Board[90] reported 4% victimization in 2010, compared to 6% in both 2011 and 2012. Using data from a Canadian subsample of the World Health Organization Health Behaviours in School-aged Children Survey, Cappadocia[34] found that 7% of grade 9 to 11 students were victims in 2006 and 8% in 2007, while perpetration remained stable at 7%.

While I was not able to obtain data from the most recent (2009/2010) cycle of this survey, Canadian bullying researcher Wendy Craig, who has access to the data, remarked in a 2012 media interview[22] that "there is no evidence in Canada of an increase in cyberbullying since 2006". It is not clear whether this refers to victimization, perpetration, or both, and the connection to the WHO data is assumed.

This review did find some evidence that the prevalence of cyberbullying is slowly

increasing over time, but it is not quite appropriate to discuss cyberbullying as an 'epidemic'. This review showed that most students are not bullied or only report occasional or infrequent negative online experiences.

In fact, bullying itself can be considered endemic, an unfortunately normal aspect of social behaviour in humans. It occurs cross-culturally[130] and arises regularly in the behaviour of very small children[131]; it is even well-documented in other primates[132], and psychologists argue that it has evolutionary significance as an adaptive behaviour aggression[127,133,134]. Cyberbullying is an extension of traditional offline bullying, and it is reasonable to expect its prevalence to increase with increasing access to the technology that enables it (e.g., increasing affordability of smartphones, more computers per household).

The prevalence rates I collected from Canadian published and grey-literature studies closely paralleled those Patchin and Hinduja[42] reported from peer-reviewed studies of youth around the world, despite little overlap in included studies. The prevalence values reported by Patchin and Hinduja[42] ranged from 6% to 72% for victimization and from 3% to 44% for perpetration. Similarly, I found estimates ranging from 4% to 70% for victimization and from 2% to 56% for perpetration.

Patchin and Hinduja[42] took a simple average of these rates, reporting that 24% of youth were victims and 18% were perpetrators (in reference period that cannot be specified). Applying the same method, the average of the 53 victimization rates is 26% and the average of the 37 perpetration rates is 20%. This technique gives equal weight samples of different sizes; note that the weighted average of the victimization rates is only 15%, because larger studies tend to find lower prevalence rates. Patchin and Hinduja[42]'s values

are overestimates of whatever they represent.

Methodological Issues

Sampling and response rates. Non-representative samples (e.g., *Kids Help Phone* users, students who actively consent to participate in research) tend to inflate prevalence, whereas more representative samples yield lower rates. Large representative samples[76,90,91] tended to produce the lowest prevalence rates for a given period in spite of poor or absent construct definitions; however, this review also suggests that definitions with low specification are themselves associated with lower prevalence estimates.

Peer-reviewed academic journal articles should not be assumed to provide the best prevalence estimates, because academics (who must secure consent at multiple levels) typically feature poor participation rates (as low as 9%[73,74] of the target population) compared to research conducted by school boards and their partners.

Non-representative samples, such as the online convenience samples featured by Kids Help Phone studies[21,86] and Hinduja and Patchin[105,124] typically feature higher proportions of middle school students and females. Since there is evidence that females and middle school students experience higher rates of victimization, this observation suggests that non-representative samples are associated with higher prevalence estimates because youth involved in cyberbullying differentially elect to participate in research (i.e., volunteer bias). This underlines the importance of using school-based samples with passive consent procedures when conducting quantitative research on this subject.

It was fairly common for researchers to note that their samples were representative of the region based on certain demographic characteristics of the sample, particularly ethnicity. This implied that results from these samples could be generalized to the

population. Researchers would do well to consider other 'invisible' sources of bias (especially volunteer bias) before assuming samples are representative. Also, some authors were not clear about the location of their samples, e.g. 'a large Canadian city', leading to unwarranted inferences about the nature of cyberbullying 'in Canada'.

Definition and measurement. The canonical definition of bullying includes references to three criteria: intent to harm, repetition, and a power differential favouring the perpetrator. How important is it that these criteria be specified to participants? Vaillancourt et al.[69] randomized students to receive a measure of bullying that had a complete definition of the construct, or no definition. Providing a definition resulted in significantly lower victimization and marginally higher perpetration estimates (increased reporting of perpetration was only statistically significant for boys). In conclusion, the authors speculated that the presence of a definition might help respondents remain objective in the face of known psychological biases to negatively interpret the actions of others but positively interpret one's own actions. However, the size of the effect on victimization was very small: the mean level of victimization for students given a definition was 0.43, compared to 0.54 among students not given a definition. These points represent a fluctuation within the nebulous ordinal space between being bullied 'never' or 'once' on a five-point Likert scale.

Note that Vaillancourt et al.'s study[69] compared the use of a complete definition that specified all three criteria to no definition. Different elements could have different effects on prevalence estimation. For instance, if almost a third of students naturally recognize a power differential in bullying, it would be useful to remind them of that qualification. Yet, if people automatically assume malice in the negative actions of others,

there may be little added value in specifying the criterion of hostile intent: it simply may not be needed. Some academics[135,136] argue that the criterion of repetition is not necessary because capacity for repetition is inherent to online communication, and thus, cyberbullying:

> A single act (e.g., a nasty e-mail or an inflammatory text message) may be forwarded to hundreds or thousands of children over a period of time. From a victim's perspective, he or she may feel repeatedly bullied, to say nothing of the fact that the victim may reread the e-mail or text message himself or herself multiple times, again leading to the feeling of being bullied repeatedly. Even though there may have been only one initial act, it may have been perpetrated through many people and over time"[135] (p. 62).

Some researchers[73,74] sidestep the matter of definition by avoiding the use of the term 'cyberbullying' with participants. Rather, they assessed prevalence as the proportion of respondents identifying as victims or perpetrators of at least one negative action. In some cases, the word 'cyberbullying' was not even mentioned to participants. This technique could inflate prevalence by conflating general aggression (or even playful teasing) with bullying. This is illustrated by Mishna et al.[73], who reported cyberbullying prevalence based on involvement in at least one of six or seven forms of electronic aggression, producing estimates of 50% victimization and 34% perpetration. Mishna et al.[73] also directly asked respondents in the same sample whether they were victims of perpetrators of 'cyberbullying', which yielded estimates that were about four times lower (12% victimization and 9% perpetration). Preferring to report the larger rates, the authors argued that using the term 'cyberbullying' would create response bias in youth who are ashamed to admit to or identify with this negative behaviour.

This is not an unreasonable argument. Indeed, one cyberbullying measure[113] preceded the questionnaire items with the banner: "~Cyberbullying is not okay~" and two

clipart pieces featuring distressed victims and cruel perpetrators, a presentation that can hardly encourage honest responding. Public discourse on the subject is emotionally and politically charged. Perpetrators are portrayed as heartless delinquents and victims as emotional wrecks at the brink of self-destruction; yet in reality, online aggression often occurs in complex, escalating negative relationships where both parties feel aggrieved. For example, the ruthless cyberbullying campaign against suicide victim Megan Meier began in response to Megan gossiping about the other girl (a former close friend) and calling her a fat ugly lesbian[137].

Some sources report that youth may see cyberbullying as 'drama'[138] and snicker at parents' and teachers' concepts of 'cyberbullying' and its harms[v]; Fisk[139] describes a focus group participant who rolled her eyes and remarked that 'cyberbullying' was an "old lady word". The most recent cycle of the *Young Canadians in a Wired World* study[97] described adolescents' sense of disdain and irritation at adult concern over cyberbullying (and the link between cyberbullying, depression, and suicide); youth saw these messages as over-dramatic, repetitive, and seeking to pathologize and control their private interactions:

> Almost all of our participants were disdainful of school anti-bullying programs; they felt that, in general, teachers and principals did not understand the kinds of problems they might face and only made things worse when they intervened. Anti-bullying programs also pathologized a great deal of their everyday behaviour, and that many of their day-to-day communications were redefined as bullying by school authorities[97] (p. 5).

Youth who are irritated by adult interest in and alarm over cyberbullying may not

[v] I recall a similar eye-rolling response from Citadel High School students at a focus group session with the Nova Scotia cyberbullying task force working group in October 2011. The question of whether cyberbullying was a problem was unexpectedly met with denial, non-participation, and looks of exasperation, even as the session chair continued to press the students to admit the problem. In such circumstances it is unclear whether students truly under-report prevalence, or whether low prevalence rates are unacceptable to researchers.

be co-operative survey respondents, and as Steeves[97] indicates, they may not wish to have their experience of online conflict labelled as 'cyberbullying'.

Regardless of whether or how well the three criteria are specified, it remains important not to conflate online *bullying* with online *aggression*. Instruments measuring negative online experiences, a technique argued to encourage more honest responding[73], yield higher prevalence rates. Beyond the minimal requirement of indicating to respondents that bullying is being measured, the importance of fully defining the term (i.e., specifying negative intent, repetition, and a power differential) is not clear. As mentioned previously, a randomized trial[69] of Canadian students found that compared to no definition, a complete definition of 'bullying' resulted in significantly lower prevalence of victimization, but the magnitude of the effect was minimal.

Weak definitions may, however, cause other difficulties. For example, a study[108] that measured cyberbullying in a confusing way, with no definition, reported a lifetime prevalence rate of 27%, but the frequency measure inconsistently indicated that 57% were bullied since September. The researcher multiplied the lifetime prevalence value (27%) with the frequency rate for students bullied daily or weekly since September (13.7%) to conclude that 3.6% of students were daily or weekly cyberbullying victims (p. 84); however, the product of these values defies interpretation. Another study[116] that had students rely on their own definition of cyberbullying reported 39% victims and 19% perpetrators, but also noted that an additional 8% and 9%, respectively, were unsure if cyberbullying had occurred because they struggled with the question of intent (p. 5). The use of a clear definition would help avoid this problem. In view of these issues, researchers should take the precaution of using clear measures with good construct validity.

Researchers may wish to depart from the formal academic definition of bullying for various practical reasons; for example, to correspond with how cyberbullying is defined or measured in the community (e.g., by school boards or courts of law). Educational and legal definitions tend to avoid specifying conditions that are difficult to prove; according to the Nova Scotia Bullying and Cyberbullying Task Force report, "if the legal definition includes too many elements (each of which must be proven) it can make establishing a violation very difficult" (p. 40)[24]. Nova Scotia now defines bullying in the following way:

> Behaviour, typically repeated, that is intended to cause or should be known to cause fear, intimidation, humiliation, distress or other harm to another person's body, feelings, self-esteem, reputation or property, and can be direct or indirect, and includes assisting or encouraging the behaviour in any way[140].

Some organizations have arrived at consensus definitions of bullying, which are notably more liberal than Olweus' definition[56]. The Promoting Relationships and Eliminating Violence Network (PREVNet), which presents itself as Canada's authority on research and resources for bullying prevention[141], takes the position that bullying is a relationship problem that requires relationship solutions[142]. PREVNet puts the emphasis on whether the victim shows distress rather than on whether the perpetrator has hostile intent, since the victim's distress requires a response (aggressors may be happily unaware of the harm they do). PREVNet also notes that children consider isolated acts of aggression to be bullying. PREVNet specifies cyberbullying as "the use of email, cell phones, text messages, and internet sites to threaten, harass, embarrass, socially exclude, or damage reputations and friendships"[142].

The US Centers for Disease for Control (CDC) has presented a uniform definition of bullying for the purposes of public health surveillance[143]. The definition attempts to

address the argument that a single act of aggression can be bullying and distinguish it from other forms of peer violence. The CDC defines bullying among youth as "any unwanted aggressive behavior(s) by another youth or group of youths who are not siblings or current dating partners that involves an observed or perceived power imbalance and is repeated multiple times or is highly likely to be repeated"[143] (p. 7). Electronic bullying is defined as "bullying behaviors that use technology including but not limited to phones, email, chat rooms, instant messaging, and online posts. How technology is used to bully youths can change as new technologies or applications of existing technology are developed" (p. 25).

Cueing recall by providing examples of sources and behaviours associated with cyberbullying is good practice, because it would guard against under-reporting caused by forgetting. These examples should be revised very regularly; instruments that are only a few years old refer to web services that are now outmoded or have been re-launched (e.g. Bebo[101], MSN Messenger[113]). The online landscape for cyberbullying changes fairly quickly. Formspring.me and Ask.fm, anonymous question-and-answer sites that have been associated with numerous cyberbullying-related suicides, have both made considerable changes to their user policies in response to public pressure[144,145]. Yik Yak, an anonymous location-based online bulletin board, is the latest of such websites to emerge[146].

Investigators should not unnecessarily restrict cyberbullying measures to specific sources or behaviours. It was very common for questionnaires to describe cyberbullying as something that happens on the internet or, specifically, mobile phones. While the ability to carry a phone around at all times would increase users' exposure to cyberbullying, a phone does not have to be wireless in order to be used for cyberbullying. In 2005, the second

phase of the *Young Canadians in a Wired World* survey[96] showed that twice as many students were bullied by landline phone than by cell phone. A number of suicides have been associated[147] with bullying via voice calls: Poppy Bracey and Courtney Brown (prank calls); Lee Simpson, Seth Walsh, Kenneth Weishuhn, and Daniel Mendez (homophobic hate calls); Sladjana Vidovic (anonymous hate calls including death threats, occurring in the middle of the night); Gail Jones (silent calls also occurring in the middle of the night), Hailee Lamberth (voicemail mocking her and expressing hope she would die), Russell Joslin (threatening voicemails associated with workplace bullying), and Hayley Petee (whose neighbour was charged with 'telephone harassment').

Providing more detailed descriptions of cyberbullying in the form of examples of sources (e.g., Facebook, texting) and behaviours (e.g., sending mean notes, impersonation) seems to increase prevalence, but in a valid way (in contrast to inflation of prevalence rates from issues such as non-representative sampling or poor measurement).

This is also true of 'checklist'-type approaches that prompt participants to consider each source in turn. Stys[93] reported 2.5-fold higher prevalence values for both victimization and perpetration when evaluating involvement as at least one of six types of cyberbullying, compared to the use of a single-item measure that included even more than six examples, even though she used equivalent definitions of cyberbullying with each measure.

Cued recall may also account for part of the fourfold increase in prevalence rates for electronic aggression (measured as one of 6 or 7 negative online experiences) compared to cyberbullying (measured with a single global item) observed between the same subjects by Mishna et al.[73], although the measurement of bullying vs. aggression may also have contributed to the effect.

Vaillancourt et al.[87] noted that the global items of the Olweus Bullying and Victimization Questionnaire produced lower prevalence rates than were indicated by responses to items asking about four different forms of bullying (physical, verbal, social, and electronic). According to the authors, the global item had good specificity (as a screening question) but poor sensitivity, meaning that it was good at identifying non-involved students but less useful for identifying true cases of bullying. This is another example of how cued recall increases prevalence independently of other factors (e.g., definition, sample).

A number of studies (e.g., Pisch[113]) included different numbers or types of sources/behaviours in the definition of bullying versus the item itself; for example, presenting a number of different cyberbullying scenarios in the definition but then only asking about a certain few. This made it difficult to count the number of examples that were provided to participants; we resolved in favour of counting the number presented in either definitions or items, since they would both serve to cue recall to some extent.

Some authors included experiences of unwelcome sexual advances in measures of victimization. Per-item prevalence rates from Mishna et al.[73] show that very few students endorsed these items, but researchers should also be cautious about over-extending the definition of cyberbullying. Receiving unwelcome sexual messages or pictures does not necessarily equate to being 'bullied', though cyberbullying can certainly be sexualized (e.g., calling a girl a 'slut').

Another common issue was discrepancy between the definition of bullying described to participants and the item used to measure bullying. For example, Stanton[91] instructed participants that they were being asked about bullying, and provided a complete

definition of that construct which included four source examples for electronic bullying. However, the items assessing victimization and perpetration simply referred to 'being mean' and name-calling online. Does the result represent the prevalence of cyberbullying or the prevalence of online aggression?

A number of studies featured non-parallel measures of victimization and perpetration. For example, studies based on the questionnaire by Mishna et al.[148] determine prevalence as involvement in one of six (perpetration) or seven (victimization) negative experiences. This can create large discrepancies between what are otherwise highly correlated constructs; it is also confusing to readers, who expect that victimization and perpetration represent two sides of the same coin.

Reference period. Interpretation of lifetime prevalence rates is fraught with difficulties. They measure circumstances too distant to be relevant to current intervention, and cannot do so very reliably, given recall bias[71]. For example, a 12.5% perpetration rate found in a British sample by Smith et al.[68] breaks down to 6.8% in the last month, 2.8% in the last term, 1.8% in the last year, and only 1.4% over a year ago, despite the fact that more distant time periods had much longer exposure periods. In other words, participants showed a bias to remember more recent events.

Lifetime prevalence estimates also depend on the age/grade of the participants, because 'ever' is a longer period for older subjects. This becomes confusing when lifetime prevalence rates are averaged over a large age range; e.g., the Nova Scotia Cyberbullying Task Force survey[104] combined results from respondents ranging from kindergarten up to grade 12 (with 2% of subjects in post-secondary education). Would you average the lifetime prevalence of heart attacks in 80 year olds with that of 20 year olds? The same

principle applies here. To complicate things further, older students also have a more precise understanding of the concept of *bullying* (i.e., as opposed to aggression or teasing)[70], which is associated with decreased reporting of victimization[69,70].

Estimation of prevalence in the past 'year' can also be problematic. Studies[83,90,99] often did not indicate if cyberbullying in the 'past year' referred to incidents occurring in the current calendar year since January, the current academic year since September, the past l2 months, or even the last academic or calendar year. This situation is further complicated by the question of when surveys were administered, which is often simply not reported and may vary between subjects. For example, a large-scale survey in Quebec[106] asked students about cyber-victimization occurring since September at some point between November and May.

Frequency cut-point. The national sample from Stanton[91] was not included with the best estimates of cyberbullying prevalence (Table 18, p. 90) because the author's use of a frequency cut-point (at least 2 or 3 times) made the results difficult to compare with estimates from other studies.

Although Solberg and Olweus[82] recommend using this cut-point because frequently-bullied youth have worse outcomes than infrequently bullied youth, infrequently bullied youth themselves have worse outcomes than youth who are not bullied, making the threshold of 'frequently bullied' rather arbitrary. Results from Solberg and Olweus[82] showed strongly linear relationships between frequency of involvement (categorized into 4 levels) and a number of negative outcomes for both victims and perpetrators, including social disintegration, global negative self-evaluations, depressive tendencies for victims, and general aggression and antisocial behaviour for perpetrators.

For example, the mean antisocial behaviour score for students who were not bullying perpetrators was 7 on an instrument with a maximum score of 68, compared to 17 for students involved once or twice in the past two months, 25 for students involved 2 or 3 times a month, and 31 for students involved once a week or more often.

Solberg and Olweus[82] wrote that "there were highly significant differences for all dependent variables" between students who were involved in bullying only once or twice and those who were not involved, and admitted that "these results show that the psychosocial adjustment of students who admitted to having been bullied/bullied other students 'only once or twice' were on average clearly different from that of students who had not been bullied/not bullied other students at all" (p. 261).

The decision to recommend the cut point was based on "conceptual considerations" (p. 260) rooted in a fidelity to Olweus' definition of bullying[56], which emphasizes repetition. Solberg and Olweus[82] noted that including 'once or twice' cases as the lower bound for students involved in bullying "does not agree well" (p. 261) with that definition.

I argue that student outcomes are ultimately of much greater importance than strict adherence to a particular definition of bullying. Solberg and Olweus[82] themselves provided clear evidence that even infrequent bullying is indeed a cause for concern, as do data from the *BC Adolescent Health Survey*[115], which showed that 20% of youth bullied only once in 12 months considered suicide, compared to 9% in those who were not victimized and 31% in those who were victimized two or more times.

There is strong positive skew in frequency distributions for both cyberbullying and offline bullying. This review showed that a median of 60% of youth involved as victims and 72% of youth involved as perpetrators endorsed the lowest level of cyberbullying

frequency. Similarly, results from Solberg and Olweus[82] showed that 68% of traditional bullying victims and 81% of perpetrators were 'once or twice' cases. From a public health perspective, it would be irresponsible to dismiss cases of infrequent bullying simply because they are associated with fewer negative outcomes than are cases of frequent bullying. Infrequently involved youth nevertheless experience negative outcomes at significantly greater rates than non-involved youth[82], and their much greater numbers mean that they make a greater overall contribution to negative outcomes at a population level than do the minority of frequently involved youth.

There are other reasons why frequency cut-points are should not be recommended for estimation of cyberbullying prevalence. As previously discussed, the criterion of repetition (which cut-points enforce) is less relevant for online communication, where the capacity for repetition and wide dissemination is inherent to the medium. Additionally, use of the 'at least 2 or 3 times' cut-point has such a depressing effect on prevalence values in short reference periods (i.e., the past 1 or 2 months) that floor effects could make the variables useless in analyses, because they re-classify the majority of victims and perpetrators as non-victims and non-perpetrators. For example, estimates from Stanton's[91] national sample were only 2% perpetration and 4% victimization.

The use of a frequency cut-point becomes more reasonable with long reference periods. For example, students who report bullying only once or twice in their lifetime are not involved in 'true' bullying from the perspective of bullying as a long-term relationship issue; yet it would be difficult to justify dismissing students who are involved in bullying once or twice a month.

Quality of reporting. Poor reporting was a common problem in research articles.

Critical information for the risk of bias assessment, such as response rate, was often missing, leading to many 'high risk of bias' judgements. Poor reporting complicated interpretation and generalization of results. For example, some authors provided item means for bullying scales (perhaps describing a scale as having four points), but did not describe the scale anchors. It is difficult to interpret the victimization result of '1.43' from Stanton's national sample[91] when one does not know what is indicated by the anchors of 1 and 2, or whether the scale started at zero. Authors were often vague about the location of their sample (e.g. 'a Canadian city') or did not report the date of data collection, which made it difficult to contextualize the results.

Collecting information about sex differences in prevalence was complicated by having to determine whether the authors were describing the percentage of victims who were female, the percentage of females who were victims, or the percentage of respondents who were female victims.

Journal editors and reviewers should promote the use of the STROBE Statement[149], which aims to strengthen the quality of reporting of observational studies in epidemiology. STROBE (strobe-statement.org), a collaborative initiative of epidemiologists, methodologists, statisticians, researchers, and journal editors involved in the conduct and dissemination of observational studies, offers checklists and guidelines for authors to use when reporting various types of observational studies. The checklist for cross-sectional studies, for example, directs authors to report the location of the sample and the date of data collection, describe measures in detail, justify the size of the sample, account for missing values, and discuss sources of bias and the generalizability of the results[149].

Age/Grade Differences

Overall, results based on cross-sectional comparisons suggest that cyberbullying victimization increases with age, peaking around late middle school/early high school before stabilizing or decreasing in high school. This pattern replicates age trends in the prevalence of non-physical offline bullying. According to PrevNET[150], non-physical bullying increases with age and peaks around the end of middle school and the beginning of high school (i.e., grade 9 or 10/ age 14 to 16), and then declines as high school proceeds.

The age differences in prevalence discussed in this review are based on research with cross-sectional designs; observed patterns could be attributed to cohort effects rather than (or in addition to) maturation. Such cohort effects could include exposure to anti-bullying programs and changes to attitudes and awareness about cyberbullying. One study by Cappadocia[34] used a one-year longitudinal design; the between-subjects comparison for different grade levels for the two separate years of data collection was described in this review. The age range and length of follow-up used in this single study are too limited to draw conclusions about longitudinal effects; however, considering the data longitudinally (see adjacent entries for Cappadocia's 2006 and 2007 data in Table 16, Appendix H, p. 194) does not contradict the pattern established by cross-sectional comparisons. For example, victimization increased from 7% in grade 9 students in 2006 to 10% in grade 10 in 2007, while it remained stable in later high school, at 7% in grade 10 in 2006 and 7% in grade 11 in 2007. We may also note that while it was difficult to see secular trends (i.e., change over time) in prevalence rates, the pattern of prevalence rates over age/grade was very clear and consistent across a heterogeneous group of studies that spanned a decade.

According to Pepler et al.[151], social aggression is developmentally sequenced;

advances in language and perspective-taking abilities are linked to increases in prevalence in early adolescence, while the development of empathy and disapproval of hurtful behaviours in others is linked to decreasing prevalence in late adolescence.

The school transition itself could provoke increased aggression. Among social animals, the kind of 'pecking order' that bullying enforces is in fact an adaptive mechanism that decreases the overall level of aggression; essentially, members know where they stand, and do not have to engage in repeated contests for dominance[152]. Destabilizing social hierarchies (e.g., adding new chickens to a coop) results in increased aggression. In young people, the transition to high school may be associated with an increase in social aggression because the existing social hierarchy is disrupted and must be re-established.

The peak prevalence of cyberbullying (victimization and perpetration) is specifically associated with the transition to high school; there was no bimodality suggesting another peak during the transition to middle school. This means that the increase in electronic aggression observed during the high school transition depends on more than simply the change in environment; for example, this may interact with the increased interest in sexual relationships that is characteristic of middle adolescence[153].

Access to technology is another factor that would influence the relation between age and the prevalence of online bullying, because youth will have greater access to technology (with less supervision) as they age. One may also wonder about secular trends independently of age; e.g., there may be more ways for 14-year olds to engage in cyberbullying in 2015 compared to 2005. In a large-scale survey with US students from 2006 to 2008, Ybarra et al.[72] found that both age and intensity and frequency of internet and cell phone use were associated with increased victimization. For example, youth with

higher general technology use had 1.75 times the odds of being victimized online, and 1.47 times the odds of being a perpetrator; these values correspond to very small and small effects, respectively[154], which would explain why increases in cyberbullying prevalence over time have been small despite considerable increases in access to technology[155].

The policy implication for the age/grade trends noted here is that anti-bullying (or healthy relationships) interventions should target the early years, and reinforce and upgrade skills and awareness as youth age and their social environments become more complex and gendered. It may not be sufficient to expose students to anti-bullying interventions only when they reach middle school; rather, awareness of bullying and positive social and emotional skills should be in place before prevalence begins to increase in late elementary school.

Sex Differences

Results indicated that females experience slightly higher victimization and perpetration than males, though sex differences were smaller for perpetration**.** The median ratio of prevalence in females to males was 1.2 for victimization and a mere 1.04 for perpetration. Sex differences (of either direction) only accounted for a median of 1% of the variation in both victimization and perpetration, a small effect.

In addition to a greater prevalence of cyber-victimization, females also experience greater negative impact than males. Boys are more likely to say that they are not bothered by cyberbullying or take it as a joke[88,156] whereas younger students and girls are more likely to report that cyberbullying is sometimes or often a problem[88]. Population-level data from Arizona respondents to the Youth Behavior Risk Survey[157] showed that depression mediated the link between cyber-victimization and attempted suicide in the past 12 months,

but only in females. Klomek et al.[29] reported that infrequent cyber-victimization was associated with depression and serious suicidal ideation in females, but not males. A study of 120 cases of completed suicide associated with cyberbullying[158] found that 64% of victims were female, which is striking because the base rate of suicide is normally three to five times higher for young males[158].

The most common attacks reported by adolescent female cyber-victims are gossip and insults like 'fat', 'ugly', 'slut', and 'bitch'[159]; in contrast, cyberbullying experienced by males tends to be homophobic, transphobic or racist[160].

According to researcher Valerie Steeves[88], girls are more likely to cyberbully because somebody said something mean first and because they did not like the person, whereas boys are more likely to cyberbully because they were joking around, bored, or because their friends were doing it. According to focus-group research[156], boys are more likely to perpetrate cyberbullying in the context of intimate relationships.

Overall, cyberbullying tends to occur ***within*** rather than *between* gender groups, whether because of increased exposure to same-sex peers or for other reasons. In a sample of Saskatchewan grade 9 to 12 students (included in this review), Yvonne Stys[93] showed that females were significantly more likely to be cyberbullied by other females than by males; likewise, males were more likely to be cyberbullied by other males than by females. For example, 50% of female cyber-victims were targeted by another female, 12% by a male, 7% by a group of females, 2% by a group of males, and 29% by mixed gender groups.

When Stys[93] asked cyberbullies about the gender of their victim, 67% of female cyberbullies admitted to targeting another female, 13% targeted males, 2% targeted groups of females, none targeted groups of males, and 18% targeted groups of males and females.

Female cyberbullies were also more likely to target male victims (13%) than male cyberbullies were to target female victims (5%). Similarly, when Carrie Buchanan[84] asked young women in BC about the gender of their high school cyberbullies, 70% reported that they were victimized by other females compared to only 6% who were victimized by males (the remaining 24% were cyberbullied by both males and females). Forty-seven percent of the young women in the sample admitted to having cyberbullied other females in high school, 12% had cyberbullied males, and the remaining 41% cyberbullied both.

Most cyberbullying among young people (64% among 15 to 24 year olds) occurs between friends, acquaintances, or classmates[93]. About 20% of girls are cyberbullied by somebody they don't know[93,159], but overall women are less likely to be bullied by a stranger than men[76]. While Toronto youth in a focus group[161] feared cyberbullying because perpetrators can be anonymous, most of the cyberbullying they described actually took place within their social groups and relationships.

Tracy Vaillancourt attributes relational aggression between females to 'intrasexual competition' for males[127]. Research[162–166] documents that heterosexual males tend to prefer young women with certain physical characteristics who are less sexually experienced and more likely to be sexually faithful for long-term partners (i.e., 'good girls').

According to Vaillancourt[167], females can effectively compete for male partners by derogating their rivals: "The derogation of competitors involves making a rival seem less attractive or less appealing…which is typically achieved by disparaging the competitor's appearance or by spreading rumours that question the fidelity or level of promiscuity of a rival" (p. 1). Rivals who pose a greater threat are more likely to be attacked: one study found that being judged physically attractive increased an adolescent's odds of being

attacked by other girls by 35%[133]. In effect, this creates a zero-sum game were girls are devalued if they are not thin, pretty, etc.; yet, achieving these standards leads to more harm as girls jostle each other for the security and status provided by relationships with males.

There is a need for approaches that support relationships for girls and young women, with a focus on same-sex friendships. Current programs for social and emotional learning do not take a gender-based perspective, and the PATHS (Promoting Alternative Thinking Strategies) program[168], which has been widely promoted in Nova Scotia[169], has only showed statistically significant results for boys[170]. Anti-bullying interventions need to recognize relationship dynamics such as intrasexual competition[127] which contribute to both victimization and perpetration in females. Though research has discussed the relative fragility of females' relationships with each other[171], existing materials[172–174] on healthy relationships for girls are centered on relationships with males through the subject of dating violence. Women's relationships with other women are unique[175], rich and therapeutic[176], and are a subject worthy of consideration. However, at the time of this writing, Google Scholar searches of terms such as 'female bonding' are dominated by results from primatologists or research studying mothers and their newborns, whereas results for 'male bonding' mostly describe human friendships.

Strengths

At present, public debate about cyberbullying is highly politicized and the presence of a wide range of prevalence estimates allows people to 'pick and choose' those that best support their point of view on the question of intervention or legislation. This project is the first comprehensive, systematic review of cyberbullying research in Canada. The ultimate aim of the project was to provide the public with the best possible understanding

of the scope of the problem, so that the issue can be addressed appropriately.

Some researchers conclude that prevalence rates for cyberbullying are too disparate to compare[24,36], while others summarize markedly different studies into single estimates[37,42] that are difficult to interpret or apply. This project shows that systematically relating prevalence rates to study and subject characteristics, even in crude narrative form, uncovers strong and consistent patterns.

A key strength of this review is the inclusion of 'grey literature' (e.g., school board reports, government reports, theses), which allowed a much more comprehensive overview of prevalence than existing reviews that are only based on peer-reviewed published papers.

At first glance, restriction to peer-reviewed journal articles seems like a rigorous approach. In fact, it is a more convenient approach: Searching the 'grey literature' is messy, time consuming, and haphazard compared to using databases such as PsycINFO, which respond well to structured searches. However, peer-reviewed journal articles do not necessarily present the best estimates of prevalence; for example, certain highly-cited articles[38–40,47,123] make inferences about cyberbullying in 'Canada' using small convenience samples with poor response rates from a handful of middle schools in Calgary, and the number of republications based on the same dataset create the illusion that the observations are well-replicated. In contrast, 'grey literature' sources such as internal school board research (e.g., school climate or safety surveys) are often based on very large samples and passive consent procedures. Scientific articles must be evaluated on their own merits; the 'peer reviewed' label is not an automatic assurance of high quality, but merely an indication that quality has been assessed (to an unknown standard).

Limitations

A key limitation of this project is that the best prevalence estimates may be hidden. While academic researchers are motivated to publish and disseminate their prevalence research, their research is often limited by small local samples and response rates that are often low at the level of schools, classrooms, and individual students. School boards have much more power to compel participation from schools and students, and may be able to bypass many consent procedures required by researchers (i.e., they have the ability to use passive consent procedures); however, school boards may be reluctant to 'air their dirty laundry' and alarm parents by releasing data on the prevalence of school problems such as cyberbullying. The fact that schools are unwilling to release this information is illustrated by the fact that journalists will use somewhat adversarial procedures, such as making demands under access-to-information laws[20], to access school-board data.

One might ask if publically-available research from school boards is representative of all school-board surveys. The reports we have tend to show very low prevalence rates. Is this due to high quality sampling, or can it be attributed to something akin to publication bias, whereby school boards only post their results online if they show positive student outcomes? It is reassuring that the Toronto District School Board 2011 student census, which was shared by a journalist who obtained it through somewhat adversarial means, presented one of the lowest prevalence rates (9% lifetime victimization).

Grey literature was much more difficult to find than formally-published research indexed in databases such as Web of Science. Google Web and Scholar were the best sources of grey literature, but results popped up haphazardly; searching the same terms a couple of days later would not reproduce the same results.

Ideally, some of these data could have been obtained from academics, because many graduate theses were based on school board data. While I was able to include several such theses in this review, many studies of this type did not present the necessary prevalence information, leading me to attempt to contact the authors. Contact most often could not be established, and only a few corresponding authors ultimately shared the information I requested.

Perhaps more studies could have been found through 'snowballing' the literature search by checking the references of each paper for cited papers, and entering each included study into Web of Science to find each paper that cited it. A snowball search was planned in the proposal for this project but was not undertaken for various reasons, including difficulty encountered in obtaining an independent review of the literature search.

Resource limitations also precluded the independent review of French-language studies for eligibility, risk of bias assessment, and data abstraction. Fortunately, there was only a small number of these studies (only 4 were included).

Future Research

This review summarized patterns in prevalence data with broad strokes, in a narrative form. It would also be possible to take a quantitative approach, using regression methods to show how factors highlighted in this review (e.g., features of the definition, length of the reference period, and the number of recall cues), constructed as categorical or ordinal variables, contribute to variation in prevalence rates.

It would also be useful to study the effect of other subject characteristics on prevalence besides age/grade and sex; for example, ethnicity, sexual orientation, immigrant status, rural/urban status, and socioeconomic status. Two studies[76,100] remarked on

prevalence in non-heterosexual populations. The *Juristat* report for the 2009 Statistics Canada General Social Survey[76], a national telephone survey with a 62% response rate, noted that almost one-quarter of bisexuals (24%) and one-fifth of homosexuals (18%) were cyber-bullied, compared to only 7% of heterosexuals; however, the survey was not limited to youth, with respondents aged 15 to over 65.

Boucher et al.[100] recruited a non-representative convenience sample of 14 to 22 year olds in Quebec through advertisements on Facebook and emails to community organizations, student unions, and LGBT societies in universities and colleges across Quebec. In contrast to the General Social Survey, Boucher et al.[100] found a higher prevalence of victimization in heterosexual respondents (28%) compared to non-heterosexual respondents (23%). In keeping with the General Social Survey[76], Boucher et al.[100] also found that bisexual respondents reported higher victimization (26%) than homosexual respondents (19%). Boucher et al.[100] noted the highest prevalence of victimization in trans-identified respondents (33%). Cyberbullying in LGBT-identified youth is a good direction for future research, given public concern over cyberbullying related suicides by young gay males[177–179], which seem disproportionately high[147].

Various studies included in this review pointed out the diversity of their subjects, but without subgroup analyses, one cannot assume that overall results generalize to all groups in the sample because averages will always be pulled in the direction of the majority. The 2009 Statistics Canada General Social Survey[76] and Canadian data from the two most recent cycles of the Health Behaviours in School Aged Children surveys[180] would be excellent sources of secondary data.

Regional differences in the prevalence of cyber-victimization would also be a good

area for research. For example, why is prevalence so much lower in Quebec and Toronto, and what can the rest of Canada take from this? Valerie Steeves observed (personal communication, 13 June 2014) that Toronto students were thoroughly exasperated with discussion of cyberbullying. This suggests that active and repeated efforts to educate students about cyberbullying achieved real results, in addition to considerable irritation.

The difference in prevalence rates from Quebec and provinces outside of Quebec could be due to cultural or linguistic factors; comparing data from Francophone versus Anglophone Quebecers would be one way to address this.

Universal child care is also one way Quebec stands apart from the rest of Canada. Parenting has an important connection to both victimization by and perpetration of cyberbullying: Cyberbullies are more likely to have permissive or neglectful parents[181], while victims of bullying are more likely to have been exposed to negative parenting behavior including abuse and maladaptive parenting styles[182] including overprotectiveness[183]. Accessible government-regulated early childhood education is of particular benefit to disadvantaged children with learning and behavioural issues[184].

Guidelines for researchers. This review has highlighted a number of issues in this field of research. The following key suggestions are offered to researchers in the area.

Authors should always specify sampling procedures and response rates, and should adhere to standards for good reporting in epidemiological research (e.g., the STROBE statement[149]). Good sampling is vital. Researchers should avoid convenience samples whenever possible, whether online or school-based, and are encouraged to collaborate with school administrators on large-scale internal research (e.g., school climate surveys) with passive consent procedures.

Researchers should consider whether their research question is better suited to a measure of electronic *aggression*, or the more specific construct of electronic *bullying*. While definitions of bullying traditionally refer to *hostile intent*, *repetition,* and *a power differential favouring the perpetrator*, researchers are reminded that while bullying should not be conflated with aggression, quality sampling, high response rates, and clear reference periods are at least as, if not more important than, quibbles over the definition of 'bullying'.

The construct that is being measured – bullying or aggression – must be clearly described on the survey instrument, and questionnaire items must be consistent with that definition. Victimization and perpetration items should use parallel wording.

Examples of cyberbullying sources or behaviours are helpful as recall cues, but prevalence rates should not be restricted to certain sources, e.g., mobile phones but not land line phones. Examples of cyberbullying sources and behaviours should be updated regularly (at least once per year) to keep up with changing trends in youth internet use.

Researchers should avoid lifetime prevalence estimates unless they are required by the research question. Reference periods of 3 months or fewer are preferable. The reference period must be clearly and precisely communicated to participants, who should all be surveyed at the same time, particularly if the reference period could vary between subjects (e.g., 'since September').

Researchers should refrain from using frequency cut-points such as 'at least 2 to 3 times' in short reference periods. This technique severely depresses prevalence rates and results in a loss of information about respondents who are infrequently involved in bullying, an important and relatively large demographic of at-risk youth. Cut-points are more appropriate for very long reference periods (e.g., lifetime prevalence).

REFERENCES

1. GreyNet GLNS. GL'99 Conference Program. In: *Fourth International Conference on Grey Literature: New Frontiers in Grey Literature*. Vol Washington, DC; 1999. www.greylit.org/about.

2. Menesini E, Nocentini A. Cyberbullying Definition and Measurement. *Zeitschrift für Psychol / J Psychol*. 2009;217(4):230-232. doi:10.1027/0044-3409.217.4.230.

3. D'Entremont Y. This Shouldn't Happen. *Halifax News Net*. 2013.

4. Arenburg PB. When words can kill. *Chron Her*. October 2011. http://thechronicleherald.ca/thenovascotian/26731-when-words-can-kill. Accessed July 16, 2013.

5. Scott JP. Courtney Brown's suicide and the tragic effects of bullying. *Can Living*. 2011:1-2. http://www.canadianliving.com/life/community/courtney_browns_suicide_and_the_tragic_effects_of_bullying.php.

6. The Canadian Press. Nova Scotia announces task force to examine prevalence of cyberbullying. *The Globe and Mail*. http://www.theglobeandmail.com/technology/tech-news/nova-scotia-announces-task-force-to-examine-prevalence-of-cyberbullying/article575459/. Published April 6, 2012.

7. *Promotion of Respectful and Responsible Relationships Act*. Vol 30. Halifax, Nova Scotia, Canada; 2012. http://nslegislature.ca/legc/bills/61st_4th/3rd_read/b030.htm.

8. *Cyber-Safety Act*. Halifax, Nova Scotia; 2013. http://novascotia.ca/just/global_docs/Cyberbullying_EN.pdf.

9. Auld A. Nova Scotia to create investigative unit to crack down on cyberbullying. *CTV News*. www.ctvnews.ca/canada/nova-scotia-to-create-investigative-unit-to-crack-down-on-cyberbullying-1.1254012. Published 2013.

10. CyberSCAN. 2014. http://cyberscan.novascotia.ca.

11. The Associated Press. Canadian teen found dead weeks after posting wrenching YouTube video detailing bullying. *Fox News*. 2014. http://www.foxnews.com/world/2012/10/12/canadian-teen-found-dead-weeks-after-posting-wrenching-youtube-video-detailing/.

12. Gillis W. Rehtaeh Parsons: A Famiy's Tragedy and a Town's Shame. *Star*. 2013. http://www.thestar.com/news/canada/2013/04/12/rehtaeh_parsons_a_familys_tragedy_and_a_towns_shame.html.

13. Mothers of Rehtaeh Parsons, Amanda Todd Welcome N.S. Cyberbully Laws. *CTV News*. 2013. http://www.ctvnews.ca/canada/mothers-of-rehtaeh-parsons-amanda-todd-welcome-n-s-cyberbully-laws-1.1402451. Accessed August 19, 2013.

14. Parents of Rehtaeh Parsons , Amanda Todd join PM at meeting Cyberbullying discussed at Winnipeg roundtable session. *CBC News*. 2014.

15. Cohen T. Federal government tables cyberbullying bill that will make it illegal to send "intimate images" without consent. *The National Post*. http://news.nationalpost.com/2013/11/20/federal-government-tables-cyberbullying-bill-that-will-make-it-illegal-to-send-intimate-images-without-consent/. Published November 20, 2013.

16. Mayer A. New cyberbullying law has "larger agenda", expands police powers. *CBC News*. http://www.cbc.ca/news/canada/new-cyberbullying-law-has-larger-agenda-expands-police-powers-1.2434797. Published November 21, 2013.

17. Government of Canada. Government of Canada Highlights Royal Assent of Bill To Help Law Enforcement Protect Victims Of Online Crime. *News Release*. 2014. http://news.gc.ca/web/article-en.do?nid=913359.

18. The Associated Press. More young people reporting cyberbullying to parents: Poll found 49% of 14- to 24-year olds have been harassed online, down from 56% 2 years ago. *CBC News*. 2013.

19. Gibson J. Cyber-bullying on the rise. *Canada.com*. 2013. http://www.canada.com/life/Cyber+bullying+rise/2915031/story.html.

20. Cain P, Paperny AM. Cyberbullying still rare, Toronto student survey shows. *Glob News*. 2013. http://globalnews.ca/news/487114/student-census-toronto-teens-say-theyre-more-likely-to-be-teased-in-person-than-cyberbullied-online/.

21. Knighton L, Simon A, Kelly J, Kimball A. *Cyberbullying: Reality Check*. Toronto, Ontario; 2012. doi:10.1037/t11611-000.

22. Hamilton G. Amanda Todd and the greatly exaggerated cyber-bullying plague: Web harassment not on the rise, researcher says. *Natl Post*. 2012. http://news.nationalpost.com/2012/10/26/amanda-todd-and-the-greatly-exaggerated-cyber-bullying-plague-web-harassment-isnt-rising-researcher-says/.

23. Wu S. The cyberbullying epidemic. *Can Fam*. http://www.canadianfamily.ca/parents/relationships/cyberbullying-epidemic/.

24. McKay W. *Respectful and Responsible Relationships: There's No App for That*. Halifax, Nova Scotia; 2012.

25. Patchin JW, Hinduja S. Cyberbullying and self-esteem. *J Sch Health*. 2010;80(12):614-621; quiz 622-624. doi:10.1111/j.1746-1561.2010.00548.x.

26. Schenk AM, Fremouw WJ. Prevalence, Psychological Impact, and Coping of Cyberbully Victims Among College Students. *J Sch Violence*. 2012;11(1):21-37. doi:10.1080/15388220.2011.630310.

27. Juvonen J, Gross EF. Extending the school grounds?—Bullying experiences in cyberspace. *J Sch Health*. 2008;78(9):496-505. doi:10.1111/j.1746-1561.2008.00335.x.

28. Kowalski R, Limber SP. Psychological, physical, and academic correlates of cyberbullying and traditional bullying. *J Adolesc Health*. 2013;53(1 Suppl):S13-S20. doi:10.1016/j.jadohealth.2012.09.018.

29. Klomek AB, Marrocco F, Kleinman M, Schonfeld IS, Gould MS. Peer victimization, depression, and suicidiality in adolescents. *Suicide Life Threat Behav*. 2008;38(2):166-180. doi:10.1521/suli.2008.38.2.166.

30. Hinduja S, Patchin JW. Bullying, cyberbullying, and suicide. *Arch Suicide Res*. 2010;14(3):206-221. doi:10.1080/13811118.2010.494133.

31. Gámez-Guadix M, Orue I, Smith PK, Calvete E. Longitudinal and Reciprocal Relations of Cyberbullying With Depression, Substance Use, and Problematic Internet Use Among Adolescents. *J Adolesc Health*. May 2013:1-7. doi:10.1016/j.jadohealth.2013.03.030.

32. Blais JJ. Chatting, befriending, and bullying: Adolescent internet experiences and associated psychological outcomes. 2008.

33. Ybarra ML, Mitchell KJ. Youth engaging in online harassment: associations with caregiver-child relationships, Internet use, and personal characteristics. *J Adolesc*. 2004;27(3):319-336. doi:10.1016/j.adolescence.2004.03.007.

34. Cappadocia MC. Cyberbullying and cybervictimization: Prevalence, stability, risk and protective factors, and psychosocial problems. 2008;(December).

35. Cappadocia MC, Craig WM, Pepler D. Cyberbullying: Prevalence, Stability, and Risk Factors during Adolescence. *Can J Sch Psychol*. 2013;28(2). doi:10.1177/0829573513491212.

36. Kiriakidis SP, Kavoura A. Cyberbullying: A review of the literature on harassment through the Internet and other electronic means. *Fam Community Health*. 2010;33(2):82-93. doi:10.1097/FCH.0b013e3181d593e4.

37. Tokunaga RS. Following you home from school: A critical review and synthesis of research on cyberbullying victimization. *Comput Human Behav*. 2010;26(3):277-287. doi:10.1016/j.chb.2009.11.014.

38. Li Q. Cyberbullying in Schools: A Research of Gender Differences. *Sch Psychol Int*. 2006;27(2):157-170. doi:10.1177/0143034306064547.

39. Li Q. Bullying in the new playground - cyberbullying and cyber victimisation. *Australas J Educ Technol*. 2007;23(4):435-454. http://www.ascilite.org.au/ajet/ajet23/li.html. Accessed August 2, 2013.

40. Li Q. New bottle but old wine: A research of cyberbullying in schools. *Comput Human Behav*. 2007;23(4):1777-1791. doi:10.1016/j.chb.2005.10.005.

41. Li Q. A cross-cultural comparison of adolescents' experience related to cyberbullying. *Educ Res*. 2008;50(3):223-234. doi:10.1080/00131880802309333.

42. Patchin JW, Hinduja S. Cyberbullying: An update and synthesis of the research. In: Patchin JW, Hinduja S, eds. *Cyberbullying Prevention and Response: Expert Perspectives*. Vol New York: Routledge; 2012:13-35.

43. Riebel J, Jäger RS, Fischer UC, Jager RS. Cyberbullying in Germany – an exploration of prevalence, overlapping with real life bullying and coping strategies. *Psychol Sci Q*. 2009;51(3):298-314. doi:10.1089/109493104323024500.

44. Juvonen J, Gross EF. Extending the school grounds?--Bullying experiences in cyberspace. *J Sch Health*. 2008;78(9):496-505. doi:10.1111/j.1746-1561.2008.00335.x.

45. Kowalski R, Limber SP. Electronic bullying among middle school students. *J Adolesc Heal*. 2007;41(6 Suppl 1):S22-S30. doi:10.1016/j.jadohealth.2007.08.017.

46. Sourander A, Klomek AB, Ikonen M, et al. Psychosocial risk factors associated with cyberbullying among adolescents. *Arch Gen …*. 2010;67(7):720-728. http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Psychosocial+Risk+Factors+Associated+With+Cyberbullying+Among+Adolescents#2. Accessed October 28, 2013.

47. Beran TN, Li Q. The Relationship between Cyberbullying and School Bullying. *J Student Wellbeing*. 2007;1(December):16-33.

48. Patchin JW, Hinduja S. Traditional and Nontraditional Bullying Among Youth: A Test of General Strain Theory. *Youth Soc*. 2010;43(2):727-751. doi:10.1177/0044118X10366951.

49. Ybarra ML, Mitchell KJ. Online aggressor/targets, aggressors, and targets: a comparison of associated youth characteristics. *J Child Psychol Psychiatry*. 2004;45(7):1308-1316. doi:10.1111/j.1469-7610.2004.00328.x.

50. Ybarra ML, Mitchell KJ, Wolak J, Finkelhor D. Examining characteristics and associated distress related to Internet harassment: findings from the Second Youth Internet Safety Survey. *Pediatrics*. 2006;118(4):e1169-e1177. doi:10.1542/peds.2006-0815.

51. Ybarra ML, Mitchell KJ. Prevalence and frequency of Internet harassment instigation: implications for adolescent health. *J Adolesc Health*. 2007;41(2):189-195. doi:10.1016/j.jadohealth.2007.03.005.

52. Aricak T, Siyahhan S, Uzunhasanoglu A, et al. Cyberbullying among Turkish adolescents. *Cyberpsychol Behav*. 2008;11(3):253-261. doi:10.1089/cpb.2007.0016.

53. Ang RP, Goh DH. Cyberbullying among adolescents: the role of affective and cognitive empathy, and gender. *Child Psychiatry Hum Dev*. 2010;41(4):387-397. doi:10.1007/s10578-010-0176-3.

54. Vitiello B, Stoff DM. EBP Tools Subtypes of Aggression and Their Relevance to Child Psychiatry. *J Am Acad Child Adolesc Psychiatry*. 1997;36(3):307-315.

55. Olweus D. Sweden. In: Smith PK, Morita Y, Junger-Tas J, Olweus D, Catalano R, Slee P, eds. *The Nature of School Bullying: A Cross-National Perspective*. Vol London, England: Routledge; 1999:7-27. http://books.google.ca/books?id=Fj6i8AHNT5AC&pg=PR1&dq=the+nature+of+school+bullying&hl=en&sa=X&ei=pfd3UpSfC8LLsQS09ICADg&ved=0CDkQ6AEwAA.

56. Olweus D. *Bullying at School: What We Know and What We Can Do*. New York: Blackwell; 1993.

57. Hazelden Foundation. Recognizing Bullying. *Violence Prev Work Safer Sch Safer Communities*. 2013. www.violencepreventionworks.org/public/recognizing_bullying.page.

58. Bully. *Merriam-Webster Dict*. 2013. www.merriam-webster.com/dictionary/bully.

59. bully. *dictionary.com*. 2014. http://dictionary.reference.com/browse/bully?s=t.

60. Farrington D, Loeber R. Bullying perpetration and victimization as predictors of delinquency and depression in the Pittsburgh Youth Study. *J Aggress …*. 2011;3(2):74-81. doi:10.1108/17596591111132882.

61. Sourander A, Ronning J, Brunstein-Klomek A, et al. Childhood bullying behavior and later psychiatric hospital and psychopharmacologic treatment: findings from the Finnish 1981 birth cohort study. *Arch Gen Psychiatry*. 2009;66(9):1005-1012. doi:10.1001/archgenpsychiatry.2009.122.

62. Turner HA, Finkelhor D, Shattuck A, Hamby S. Recent victimization exposure and suicidal ideation in adolescents. *Arch Pediatr Adolesc Med*. 2012;166(12):1149-1154. doi:10.1001/archpediatrics.2012.1549.

63. Belsey B. What is Cyberbullying? *www.cyberbullying.org*. 2004. www.cyberbullying.org/pdf/cyberbullying_information.pdf.

64. Jerome L, Segal A. Bullying by Internet. *J Am Acad Child Adolesc Psychiatry*. 2003;42(7):751.

65. Campbell M. Cyber bullying: An old problem in a new guise? *Aust J Guid Couns*. 2005;15(1):68-76. doi:10.1375/ajgc.15.1.68.

66. Keith S, Martin M. Cyber-bullying: Creating a culture of respect in a cyber world. *Reclaiming Child youth*. 2005;13(4):224-228. http://www.gacsi.org/sites/default/files/content/attachments/CyberBullying-Creating a culture of respect in a cyber world.pdf. Accessed October 28, 2013.

67. Spears B, Slee P, Owens L, Johnson B. Behind the Scenes and Screens. *Zeitschrift für Psychol / J Psychol*. 2009;217(4):189-196. doi:10.1027/0044-3409.217.4.189.

68. Smith PK, Mahdavi J, Carvalho M, Fisher S, Russell S, Tippett N. Cyberbullying: Its nature and impact in secondary school pupils. *J Child Psychol Psychiatry*. 2008;49(4):376-385. doi:10.1111/j.1469-7610.2007.01846.x.

69. Vaillancourt T, McDougall P, Hymel S, et al. Bullying: Are researchers and children/youth talking about the same thing? *Int J Behav Dev*. 2008;32(6):486-495. doi:10.1177/0165025408095553.

70. Bieber K. Do Students Understand What Researchers Mean by Bullying? 2013. http://digitalcommons.unl.edu/cehsdiss/176/. Accessed October 3, 2013.

71. Ashcraft MH, Klein R. *Cognition, First Canadian Edition*. Vol 1st ed. Don Mills, Ontario: Pearson Education Canada; 2009. http://www.amazon.com/Cognition-First-Canadian-Edition-Ashcraft/dp/013605286X. Accessed November 6, 2013.

72. Ybarra ML, Mitchell KJ, Korchmaros JD. National trends in exposure to and experiences of violence on the Internet among children. *Pediatrics*. 2011;128(6):1376-1386. doi:10.1542/peds.2011-0118.

73. Mishna F, Cook C, Gadalla T, Daciuk J, Solomon S. Cyber bullying behaviors among middle and high school students. *Am J Orthopsychiatry*. 2010;80(3):362-374. doi:10.1111/j.1939-0025.2010.01040.x.

74. Wade A, Beran TN. Cyberbullying: The New Era of Bullying. *Can J Sch Psychol*. 2011;26(1):44-61. doi:10.1177/0829573510396318.

75. Rosenthal R, Rosnow RL. *The Volunteer Subject*. Oxford, England: John Wiley & Sons; 1975. http://psycnet.apa.org/index.cfm?fa=search.displayRecord&uid=1975-20053-000. Accessed November 6, 2013.

76. Perreault S. *Self-Reported Internet Victimization in Canada, 2009*.; 2011. http://www.statcan.gc.ca/pub/85-002-x/2011001/article/11530-eng.htm. Accessed July 24, 2013.

77. Cross D, Shaw T, Hearn L, et al. *Australian Covert Bullying Prevalence Study*. Perth, Australia; 2009.

78. Dalhousie University. Health Sciences Research. *Libraries*. 2014. http://libraries.dal.ca/research/health_sciences_research.html.

79. Dalhousie University. Social Sciences Research. *Libraries*. 2014;(Part 1). http://libraries.dal.ca/research/social_sciences_research.html.

80. Canadian Agency for Drugs and Technologies in Health. Grey Matters: A Pracitical Search Tool for Evidence-Based Medicine. *Resources*. 2014. http://www.cadth.ca/en/resources/finding-evidence-is/grey-matters.

81. Hoy D, Brooks P, Woolf A, et al. Assessing risk of bias in prevalence studies: modification of an existing tool and evidence of interrater agreement. *J Clin Epidemiol*. 2012;65(9):934-939. doi:10.1016/j.jclinepi.2011.11.014.

82. Solberg ME, Olweus D. Prevalence estimation of school bullying with the Olweus Bully/Victim Questionnaire. *Aggress Behav*. 2003;29(3):239-268. doi:10.1002/ab.10047.

83. Trach J, Hymel S, Waterhouse T, Neale K. Bystander Responses to School Bullying: A Cross-Sectional Investigation of Grade and Sex Differences. *Can J Sch Psychol*. 2010;25(1):114-130. doi:10.1177/0829573509357553.

84. Buchanan CM. Predicting and understanding sexual and nonsexual adolescent peer victimization in schools: A mixed methods approach. 2012.

85. Steckley L. *Safe School Survey Report*. Waterloo, Ontario; 2010. http://chd.region.waterloo.on.ca/en/researchResourcesPublications/resources/SAFE_SCHOOL_SURVEY.pdf. Accessed July 30, 2013.

86. Lines E. *Cyber-Bullying: Our Kids' New Reality*. Toronto; 2007. http://events.kidshelpphone.ca/flipbooks/CriticalIssueReports/2007_CyberBullying_EN.pdf.

87. Vaillancourt T, Trinh V, McDougall P, et al. Optimizing Population Screening of Bullying in School-Aged Children. *J Sch Violence*. 2010;9(3):233-250. doi:10.1080/15388220.2010.483182.

88. Steeves V. *Cyberbullying: Dealing with Online Meanness, Cruelty and Threats*. Ottawa, Ontario; 2014.

89. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. Vol 2nd.; 1988:567. doi:10.1234/12345678.

90. Gauthier A, Sangiorgio A, Pessione S, Rodrigues B. *Secondary Safe Schools Survey 2012-2013*. Toronto, Ontario; 2013.

91. Stanton L. National study concerning bullying: Prevalence rates and associated psychological and behavioural consequences. 2011.

92. Murphy AN. Electronic Bullying and Aggression in Adolescents. 2009. http://qspace.library.queensu.ca/bitstream/1974/5198/1/Murphy_Ashley_N_200909_MSc.pdf. Accessed May 1, 2012.

93. Stys Y. Beyond the schoolyard: examining electronic bullying among Canadian youth. 2004. http://ww.w.bullying.org/bullyingdev/client_files/text_documents/Final M.A. Thesis.doc. Accessed July 19, 2013.

94. Cassidy W, Jackson M, Brown KN. Sticks and Stones Can Break My Bones, But How Can Pixels Hurt Me?: Students' Experiences with Cyber-Bullying. *Sch Psychol Int*. 2009;30(4):383-402. doi:10.1177/0143034309106948.

95. Jackson M, Cassidy W, Brown K. "you were born ugly and youl die ugly too": Cyber-Bullying as Relational Aggression. *Educ*. 2009;15(2):68-82.

96. Spears G, Seydegart K, Zulinov P. *Young Canadians in a Wired World: Phase II Student Survey*. Ottawa, Ontario; 2005. http://mediasmarts.ca/sites/default/files/pdfs/publication-report/full/YCWWII-student-survey.pdf. Accessed July 17, 2013.

97. Steeves V. *Young Canadians in a Wired World Phase III: Talking to Youth and Parents about Life Online*. Ottawa, Ontario; 2012. http://mediasmarts.ca/sites/default/files/pdfs/publication-report/full/YCWWIII-youth-parents.pdf. Accessed August 16, 2013.

98. Gardinetti A. Impact des leçons tirées du programme « Pleins feux sur l'intimidation » d'une part, ainsi que de la mobilisation du personnel scolaire et d'élèves promoteurs de la paix d'autre part, sur le comportement des élèves de l'élémentaire en classe, dans la cour. 2010.

99. Bonanno RA, Hymel S. Cyber bullying and internalizing difficulties: above and beyond the impact of traditional forms of bullying. *J Youth Adolesc*. 2013;42(5):685-697. doi:10.1007/s10964-013-9937-1.

100. Boucher K, Blais M, Hébert M, et al. La victimisation homophobe et liée à la non-conformité de genre et l"adaptation scolaire et psychosociale chez les 14-22 ans : Résultats d"une enquête québécoise. *Rech éducations*. 2013;8:83-98. http://rechercheseducations.revues.org/1566.

101. Cochrane K. Exploring Cyberbullying in Saskatchewan. 2008;(September). http://ecommons.usask.ca/bitstream/handle/10388/etd-09062008-131308/cochrane_k.pdf?sequence=1.

102. Catholic Principals' Council of Ontario. Bullying Survey Results by Grade - Elementary. *CPCO Surv Results*. 2006.

103. Gomez-Garibello C, Shariff S, McConnell M, Talwar V. Adolescents' Evaluation of Cyberbullying Events. *Alberta J Educ Res*. 2012;58(3):474-477.

104. Halliday S. Cyberbullying task force online survey 2011: Summary of results. In: McKay W, ed. *Respectful and Responsible Relationships: There's No App for That*. Vol Halifax, Nova Scotia: Queen's Printer; 2012:31-83. http://www.ednet.ns.ca/files/reports/Cyberbullying_Task_Force_Report_appendices.pdf.

105. Hinduja S, Patchin JW. Cyberbullying: An Exploratory Analysis of Factors Related to Offending and Victimization. *Deviant Behav*. 2008;29(2):129-156. doi:10.1080/01639620701457816.

106. Laprise P, Deschesnes M, Camirand H, Bordeleau M. Environnement social des jeunes du secondaire: La famille, les amis, et l'école. In: Pica L, Traoré I, Camirand H, Laprise P, Bernèche F, Berthelot M, eds. *L' Enquête Québécoise Sur La Santé Des Jeunes Du Secondaire 2010-2011. Le Visage Des Jeunes D'aujourd'hui : Leur Santé Mentale et Leur Adaptation Sociale*. Vol Tome 2. Québec, Québec: Institut de la Statistique du Québec; 2011.

http://www.stat.gouv.qc.ca/statistiques/sante/enfants-ados/adaptation-sociale/sante-jeunes-secondaire2.pdf.

107. Magaud E, Nyman K, Addington J. Cyberbullying In Those At Clinical High Risk For Psychosis. *Early Interv Psychiatry*. January 2013. doi:10.1111/eip.12013.

108. McLean AR. Cyberbullying: Emerging concerns and solutions in an ever-increasing digital world. 2007.

109. Micosoft Trustworthy Computing. *Online Bullying Among Youth 8-17 Years Old – Canada*. Redmond, Washington; 2012.

110. Paglia-Boak A, Adlaf EM, Hamilton HA, Beitchman JH, Wolfe D, Mann RE. *The Mental Health and Well-Being of Ontario Students, 1991-2011: Detailed OSDUHS Findings*. Toronto, Ontario; 2012.

111. Pandori J. Adolescents Perceptions of Victims and Perpetrators of Cyberbullying. 2013. http://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=2536&context=etd. Accessed July 24, 2013.

112. Pettalia JL, Levin E, Dickinson J. Cyberbullying: Eliciting harm without consequence. *Comput Human Behav*. 2013;29(6):2758-2765. doi:10.1016/j.chb.2013.07.020.

113. Pisch D. Examining Adolescent Cyberbullying in Saskatchewan. 2010;(September).

114. Ruggier S. Bullying and anxiety: Social emotional programming and episodes of victimization amongst children in independent school settings. 2013;(August).

115. Smith A, Stewart D, Peled M, Poon C, Saewyc E. *A Picture of Health: Highlights from the 2008 BC Adolescent Health Survey*. Vancouver, British Columbia; 2009. http://mcs.bc.ca/pdf/AHS IV March 30 Final.pdf. Accessed July 24, 2013.

116. Stadey N. Appendix A -- Summary of the Youth Consultations / Focus Groups. In: McKay W, ed. *Respectful and Responsible Relationships: There's No App for That*. Vol Halifax, Nova Scotia: Queen's Printer; 2012:4-29. http://www.ednet.ns.ca/files/reports/Cyberbullying_Task_Force_Report_appendices.pdf. Accessed July 24, 2013.

117. Totten M, Quigley P, Morgan M. *Canadian Public Health Association Safe School Study*. Toronto, Ontario; 2004. http://www.cpha.ca/uploads/progs/_/safeschools/4-7_student_survey_e.pdf. Accessed April 30, 2012.

118. Van Ingen BG. Investigating entity theory as a mediator between peer victimization and cyberbullying. 2014;(January).

119. Wong AHC. The prevalence of ethnicity-related victimization in urban multiethnic schools. 2009.

120. Catholic Principals' Council of Ontario. Secondary School Climate Survey Grade 9-12: Bullying/Harassment Survey. *Shap Safer Cathol Sch*.:71. http://safeatschool.ca/sites/default/files/cpcothird.pdf.

121. Catholic Principals' Council of Ontario. Elementary School Climate Survey Grade 4-8: Bullying/Harassment Survey. *Shap Safer Cathol Sch*.:72-73. http://safeatschool.ca/sites/default/files/cpcosecond.pdf.

122. Yau AM, Reilly JO, Kozovski K, Rosolen L, Archer B. *2011 Grade 9-12 Student Census: School Report*. Toronto, Ontario; 2012.

123. Beran TN, Li Q. Cyber-harassment: A study of a new method for an old behavior. *J Educ Comput Res*. 2005;32(3):265. http://baywood.metapress.com/index/8YQMB04HPG4DBLLH.pdf. Accessed October 25, 2013.

124. Patchin JW, Hinduja S. Bullies Move Beyond the Schoolyard: A Preliminary Look at Cyberbullying. *Youth Violence Juv Justice*. 2006;4(2):148-169. doi:10.1177/1541204006286288.

125. Microsoft Canada. Canadian Youth Rate Online Safety as a Top Concern , but Many Still Engage in Risky Online Behaviour , Report Finds. *Marketwire*. 2009. http://www.marketwired.com/press-release/canadian-youth-rate-online-safety-as-top-concern-but-many-still-engage-risky-online-nasdaq-msft-954069.htm.

126. Cross-Tab. Global Data Collection. http://www.cross-tab.com/online.php.

127. Vaillancourt T. Do human females use indirect aggression as an intrasexual competition strategy? *Philos Trans R Soc Lond B Biol Sci*. 2013;368:20130080. doi:10.1098/rstb.2013.0080.

128. Hazelden Foundation. Olweus Bullying Questionnaire. *Olweus Bullying Progr*. http://www.vashonsd.org/mcmurray/science/justin/Resources/OlweusBullyingQuestionnaire.pdf. Accessed August 2, 2013.

129. Jeong S, Lee BH. A Multilevel Examination of Peer Victimization and Bullying Preventions in Schools. *J Criminol*. 2013;2013:1-10. doi:10.1155/2013/735397.

130. Due P, Holstein BE, Lynch J, et al. Bullying and symptoms among school-aged children: International comparative cross sectional study in 28 countries. *Eur J Public Health*. 2005;15:128-132. doi:10.1093/eurpub/cki105.

131. Rigby K. *A Meta-Evaluation of Methods and Approaches to Reducing Bullying in Pre-Schools and Early Primary School in Australia.* Canberra, Australia; 2002. www.popcenter.org/problems/bullying/PDFs/Rigby_2002.pdf.

132. Sanders CE, Phye GD. *Bullying: Implications for the Classroom*. San Diego, California: Elesevier; 2004.

133. Leenaars LS, Dane A V., Marini ZA. Evolutionary perspective on indirect victimization in adolescence: The role of attractiveness, dating and sexual behavior. *Aggress Behav*. 2008;34:404-415. doi:10.1002/ab.20252.

134. Kolbert JB, Crothers LM. Bullying and Evolutionary Psychology. (March 2014):37-41. doi:10.1300/J202v02n03.

135. Kowalski R, Limber SP, Agatston PW. *Cyber Bullying: Bullying in the Digital Age*. Malden, MA: Blackwell; 2008. http://books.google.ca/books/about/Cyber_Bullying.html?id=mAa5Z-HPWCcC.

136. Dooley JJ, Pyżalski J, Cross D. Cyberbullying versus face-to-face bullying. *Zeitschrift für Psychol / J Psychol*. 2009;217(4):182-188. doi:10.1027/0044-3409.217.4.182.

137. Zetter K. Lori Drew's Daughter "Devastated " by Friend's Suicide but Doesn't Feel Responsible. *Wired.com*. 2008.

138. Allen KP. Off the Radar and Ubiquitous: Text Messaging and Its Relationship to "Drama" and Cyberbullying in an Affluent, Academically Rigorous US High School. *J Youth Stud*. 2011;15(1):99-117.

139. Fisk N. Why Children Laugh at the Word "Cyberbullying ." *Cyborgology*. 2014. http://thesocietypages.org/cyborgology/2012/07/14/why-children-laugh-at-the-word-cyberbullying/.

140. Department of Education. Legal definitions for bullying, cyberbullying ensures consistency. 2013. http://novascotia.ca/news/release/?id=20130208006.

141. PrevNET. PREVNet: Promoting Relationships and Eliminating Violence Network. 2015. www.prevnet.ca.

142. PrevNET, Substance Abuse and Mental Health Services Administration. *Bullying: Definitions*. http://www.prevnet.ca/sites/prevnet.ca/files/fact-sheet/PREVNet-SAMHSA-Factsheet-Bullying-Definitions.pdf.

143. Gladden R., Vivolo-Kantor A., Hamburger M., Lumpkin CD. *Bullying Surveillance among Youths: Uniform Definitions for Public Health and*

Recommended Data Elements. Atlanta, GA; 2014. http://www.cdc.gov/violenceprevention/pdf/bullying-definitions-final-a.pdf.

144. Perez S. IAC Agrees To Work With Regulators On Cyberbullying Protections Following Ask.fm Deal. *TechCrunch*. http://techcrunch.com/2014/08/14/ask-com-agrees-to-work-with-regulators-on-cyberbullying-protections-following-ask-fm-acquisition/. Published August 14, 2014.

145. O`Dell J. Formspring Takes a Stand Against Bullies — With Help From MIT. *Mashable*. http://mashable.com/2011/03/10/formspring-bullying/. Published March 11, 2011.

146. Brigg M. Anonymous "gossip app" Yik Yak blamed for cyberbullying outbreak in schools as firm behind it formed to BAN it from being opened on school grounds. *Dly Mail*. 2014. http://www.dailymail.co.uk/sciencetech/article-2615231/Anoynmous-app-Yik-Yak-blamed-bullying-schools-amid-calls-firm-trying-way-ban-children-using-it.html.

147. LeBlanc J, Bilsbury T, Parkington K. *Cyberbullying and Completed Suicide: A Retrospective Analysis of 120 Cases*. Halifax, Nova Scotia; 2014.

148. Mishna F, MacFadden R, Gadalla T, Daciuk J, Solomon S, Cook C. *Cyber Bullying Survey*. Toronto, Ontario; 2008. http://www.governmentevents.ca/ypo2008/presentations/634.pdf. Accessed July 26, 2013.

149. Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *J Clin Epidemiol*. 2008;61(4):344-349. doi:10.1016/j.jclinepi.2007.11.008.

150. PREVNet, US Department of Health and Human Services. *Age Trends in the Prevalence of Bullying*. Kingston, Ontario

151. Pepler DJ, Craig WM, Connolly JA, Yuile A, McMaster L, Jiang D. A developmental perspective on bullying. *Aggress Behav*. 2006;32:376-384. doi:10.1002/ab.20136.

152. Buss DM. Handbook of Evolutionary Psychology. *Am J Hum Biol*. 2005;39:1-28. doi:10.1002/(SICI)1520-6300(200001/02)12:1<140::AID-AJHB16>3.0.CO;2-C.

153. Centers for Disease Control and Prevention. Teenagers (15-17 years of age): Developmental milestones. *Child Dev*. 2015. http://www.cdc.gov/ncbddd/childdevelopment/positiveparenting/adolescence2.html.

154. Chen H, Cohen P, Chen S. How Big is a Big Odds Ratio? Interpreting the Magnitudes of Odds Ratios in Epidemiological Studies. *Commun Stat - Simul Comput*. 2010;39(4):860-864. doi:10.1080/03610911003650383.

155. Steeves V. *Young Canadians in a Wired World - Phase III: Life Online*. Ottawa, Ontario; 2014. http://bit.ly/KGQsWR.

156. Doucette J. Gender and Grade Differences in How High School Students Experience and Perceive Cyberbullying. *Univ West Ontario - Electron Thesis Diss Repos*. 2013. http://ir.lib.uwo.ca/etd/1250. Accessed July 24, 2013.

157. Bauman S, Toomey RB, Walker JL. Associations among bullying, cyberbullying, and suicide in high school students. *J Adolesc*. 2013;36(2):341-350. doi:10.1016/j.adolescence.2012.12.001.

158. Spirito A, Esposito-Smythers C. Attempted and completed suicide in adolescence. *Annu Rev Clin Psychol*. 2006;2(1):237-266. doi:10.1146/annurev.clinpsy.2.022305.095323.

159. Burgess-Proctor A, Hinduja S, Patchin JW. *Cyberbullying Research Summary*.; 2009. http://www.cyberbullying.us/cyberbullying_girls_victimization.pdf.

160. Throop B. Cyberbullying has "hugely disproportionate impact on women and girls." *CBC News*. http://www.cbc.ca/news/cyberbullying-has-hugely-disproportionate-impact-on-women-and-girls-1.2731195. Published August 8, 2014.

161. Mishna F, Saini M, Solomon S. Ongoing and online: Children and youth's perceptions of cyber bullying. *Child Youth Serv Rev*. 2009;31(12):1222-1228. doi:10.1016/j.childyouth.2009.05.004.

162. Buss DM. Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behav Brain Sci*. 1989;12:1. doi:10.1017/S0140525X00023992.

163. Grammer K, Thornhill R. Human (Homo sapiens) facial attractiveness and sexual selection: the role of symmetry and averageness. *J Comp Psychol*. 1994;108:233-242. doi:10.1037/0735-7036.108.3.233.

164. Singh D. Is thin really beautiful and good? Relationship between waist-to-hip ratio (WHR) and female attractiveness. *Pers Individ Dif*. 1994;16:123-132. doi:10.1016/0191-8869(94)90116-3.

165. Singh D, Young RK. Body weight, waist-to-hip ratio, breasts, and hips: Role in judgments of female attractiveness and desirability for relationships. *Ethol Sociobiol*. 1995;16:483-507. doi:10.1016/0162-3095(95)00074-7.

166. Shackelford TK, Buss DM, Bennett K. Forgiveness or breakup : Sex differences in responses to a partner's infidelity. *Cogn Emot*. 2002;16:299-307. doi:10.1080/02699930143000202.

167. Vaillancourt T. Do human females use indirect aggression as an intrasexual competition strategy? *Philos Trans R Soc Lond B Biol Sci*. 2013;368:20130080. doi:10.1098/rstb.2013.0080.

168. Kelly B, Longbottom J, Potts F, Williamson J. Applying Emotional Intelligence: Exploring the Promoting Alternative Thinking Strategies curriculum. *Educ Psychol Pract*. 2004;20:221-240. doi:10.1080/0266736042000251808.

169. Wooler K. Improving health care in Nova Scotia and beyond. *Dal News*. http://www.dal.ca/news/2013/05/07/improving-health-care-in-nova-scotia-and-beyond.html. Published May 7, 2013.

170. Conduct Problems Prevention Research Group. The effects of a multiyear universal social-emotional learning program: The role of student and school characteristics. *J Consult Clin Psychol*. 2010;78(2):156-168. doi:10.1037/a0018607.

171. Benenson JF, Christakos A. The Greater Fragility of Females' Versus Males' Closest Same-Sex Friendships. *Child Dev*. 2003;74(4):1123-1129. doi:10.1111/1467-8624.00596.

172. Kelly J, Marr L-B, Ritchie S, Solomon D. *Building Equal and Healthy Relationships: Workshop for Grade 7&8 Girls*.; 2007. http://tinyurl.com/ETFO-relationships.

173. Nova Scotia Advisory Council on the Status of Women, Province of Nova Scotia. *Guide for Girls, 3rd Ed.* Halifax, NS; 2013. http://tinyurl.com/GuideForGirls.

174. Candian Women's Foundation. *Healthy Relationships 101: An Overview of School-Based Healthy Relationships Programs*. Toronto, Ontario; 2012. http://tinyurl.com/healthy-relationships-101.

175. Caldwell M, Peplau L. Sex differences in same-sex friendship. *Sex Roles*. 1982;8(7). doi:10.1007/BF00287568.

176. Elkins LE, Peterson C. Gender differences in best friendships. *Sex Roles*. 1993;29(7-8):497-508. doi:10.1007/BF00289323.

177. James SD. Gay Buffalo Teen Suicide on Eve of National Bullying Summit. *ABC News*. September 2011. http://abcnews.go.com/Health/gay-buffalo-teen-commits-suicide-eve-national-bullying/story?id=14571861#.UebM86wmPcs. Accessed July 17, 2013.

178. Hudson J. Gay Teen Suicide Sparks Debate Over Cyber Bullying. *Atl News Wire*. 2010. http://www.theatlanticwire.com/national/2010/10/gay-teen-suicide-sparks-debate-over-cyber-bullying/22829/. Accessed July 17, 2013.

179. Auge K. Suicides of bullied gay kids in other states jolt Colorado educators to action. *Denver Post*. October 2010. http://www.denverpost.com/news/ci_16314707. Accessed July 17, 2013.

180. HBSC International Coordinating Centre. Health behaviour in school-aged children: World Health Organization collaborative cross-national survey. *HSBC*. 2015.

181. Dehue F, Bolman C, Vollink T, Pouwelse M. Cyberbullying and traditional bullying in relation with adolescents perception of parenting. *J Cyber Ther Rehabil*. 2012;5:25-34. doi:413.

182. Lereya ST, Samara M, Wolke D. Parenting behavior and the risk of becoming a victim and a bully/victim: A meta-analysis study. *Child Abus Negl*. 2013;37:1091-1108. doi:10.1016/j.chiabu.2013.03.001.

183. Preidt R. Poor parenting styles linked to bullying. *WebMD News*. April 2013.

184. Kottelenberg MJ, Lehrer SF. *Reinvestigating Who Benefits and Who Loses from Universal Childcare in Canada*.; 2010. http://jdi.econ.queensu.ca/sites/default/files/Kottelenberg, Lehrer - 2010 - Reinvestigating Who Benefits and Who Loses from Universal Childcare in Canada.pdf.

185. Dalhousie Libraries Staff. Canadian Electronic Library. *eSearch@Dal*. 2014. http://esearchatdal.blogspot.ca/2008/10/canadian-electronic-library.html.

186. Dalhousie University. CINAHL Full Text. *Dalhousie Libr Search*. 2014. http://util.library.dal.ca/dmsearch/dmsearch.php?q=1&z=1&t=0&r=2&type=databases&field=bool&keyword=CINAHL.

187. Google. About Google Scholar. *Google Sch*. 2014. http://scholar.google.ca/intl/en/scholar/about.html.

188. Library and Archives Canada. Welcome to the Theses Canada Portal! *Theses Canada*. 2014. http://www.collectionscanada.gc.ca/thesescanada/index-e.html.

189. ProQuest. PAIS International. *Soc Sci Databases*. 2014. http://search.proquest.com.ezproxy.library.dal.ca/pais?accountid=10406.

190. Dalhousie University. PsycINFO. *Dalhousie Libr Search*. 2014. http://util.library.dal.ca/dmsearch/dmsearch.php?q=1&z=1&t=0&r=2&type=databases&field=bool&keyword=psycinfo.

191. National Center for Biotechnology Information. PubMed Help. *NCBI Bookshelf*. 2014;(Md). https://www.ncbi.nlm.nih.gov/books/NBK3827/.

192. ProQuest. Social Services Abstracts. *Soc Sci Databases*. 2014. http://search.proquest.com.ezproxy.library.dal.ca/socialservices?accountid=10406.

193. Dalhousie University. Web of Science Citation Database. *Dalhousie Libr Search*. 2014. http://util.library.dal.ca/dmsearch/dmsearch.php?q=1&z=1&t=0&r=2&type=databases&field=bool&keyword=web of science.

194. Aftab P. Statistics and a Snapshot of Cyberbullying Trends. http://aftab.com/index.php?page=cyberbullying-statistics .

195. Baek J, Bullock LM. Cyberbullying: a cross-cultural perspective. *Emot Behav Difficulties*. 2013;00(00):1-13. doi:10.1080/13632752.2013.849028.

196. Bailey G. Cyberbullying: Victimization Through Electronic Means. *Curr Issues Middle Lev Educ*. 2013;18(1):1-7.

197. Barrett JL. Youth's perceptions of cyber-bullying. 2009.

198. Bauman S. The Role of Elementary School Counselors in Reducing School Bullying. *Elem Sch J*. 2008;108(5):362-375. doi:10.1086/589467.

199. Bauman S, Pero H. Bullying and cyberbullying among deaf students and their hearing peers: An exploratory study. *J Deaf Stud Deaf Educ*. 2011;16(2):236-253. doi:10.1093/deafed/enq043.

200. Bedard C. Université du québec essai de 3 cycle présenté. 2008.

201. Bérubé A. La victimization par les pairs chez les élèves du primaire: Rapport d'intervention. 2011.

202. Bonanno RA. Bullied to the brink: An investigation of students at risk for depression & suicidal ideation. 2006;(December). https://circle.ubc.ca/bitstream/handle/2429/30739/ubc_2007-266847.pdf?sequence=1.

203. Brenner SW, Rehberg M. Kiddie crime'?: the utility of criminal law in controlling cyberbullying. *First Amend Law Rev*. 2009;8:1-86.

204. Brown K, Jackson M, Cassidy W. Cyber-Bullying : Developing Policy to Direct Responses that are Equitable and Effective in Addressing this Special Form of Bullying 1. *Can J Educ Adm*. 2006;(57). https://www.umanitoba.ca/publications/cjeap/articles/brown_jackson_cassidy.html .

205. Klomek AB, Sourander A, Gould M. The association of suicide and bullying in childhood to young adulthood: A review of cross-sectional and longitudinal research findings. *Can J Psychiatry*. 2010;55(5):282-288. doi:10.1016/j.ypsy.2010.10.092.

206. Calvete E, Orue I, Estévez A, Villardón L, Padilla P. Cyberbullying in adolescents: Modalities and aggressors' profile. *Comput Human Behav*. 2010;26(5):1128-1135. doi:10.1016/j.chb.2010.03.017.

207. Commission de l'éthique de la science et de la technologie. *Position Statement: Cyber Bullying: An Ethical Examination Made by Young People*. Québec, Québec: Gouvernement du Québec; 2009.

208. ÇetÍn B, Eroğlu Y, Peker A, Akbaba S, Pepsoy S. The Investigation of Relationship among Relational-Interdependent Self-Construal Cyberbullying, and Psychological Disharmony in Adolescents: An Investigation of Structural Equation Modelling. *Educ Sci Theory Pract*. 2012;12(2):646-653. http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=84706626&site=ehost-live.

209. Chamberland L, Émond G, Julien D, Otis J, Ryan B. *L' Homophobie Au Collégial Au Québec: Portrait de La Situation, Impacts et Pistes de Solution. Rapport de Recherche*. Montreal, Quebec; 2011. https://chairehomophobie.uqam.ca/upload/files/Lhomophobie_au_secondaire_au_Québec.pdf.

210. Chamberland L, Richard G, Bernier M. Les violences homophobes et leurs impacts sur la persévérance scolaire des adolescents au Québec. *Rech éducations*. 2013;8:99-114. http://recherchesеducations.revues.org/1567.

211. Christofides E, Muise a., Desmarais S. Risky Disclosures on Facebook: The Effect of Having a Bad Experience on Online Behavior. *J Adolesc Res*. 2012;27(6):714-731. doi:10.1177/0743558411432635.

212. Cliche V. La cyberintimidation, un fléau aussi présent à Magog. *Le Reflet du Lac*. 2011.

213. Cloutier M. Programme d'intervention visant à prévenir la victimisation à l'école secondaire. 2009. doi:10.1089/ees.2013.0409.

214. Craig WM, Edge HM. Bullying and Fighting. In: Freeman JG, King M, Pickett W, et al., eds. *The Health of Canada's Young People: A Mental Health Focus*. Vol Ottawa, Ontario: Public Health Agency of Canada; 2011:167-182.

215. CROP. *CSQ - Cyberintimidation Dans Le Milieu de L'éducation: Rapport Final*. Montréal, Quebec; 2011. http://www.lacsq.org/fileadmin/user_upload/csq/documents/documentation/education_formation/cyberintimidation/cyberintimidation_milieu_education.pdf.

216. Cross D, Li Q, Smith PK, Monks H. Understanding and preventing cyberbullying: Where have we been and where should we be going? In: Li Q, Cross D, Smith PK, eds. *Cyberbullying in the Global Playground*. Vol Chichester, UK: Wiley-Blackwell; 2012:287-305. doi:10.1002/9781119954484.

217. Cyr K, Chamberland C, Lessard G, et al. Polyvictimization in a child welfare sample of children and youths. *Psychol Violence*. 2012;2(4):385-400. doi:10.1037/a0028040.

218. Di Manno AP. New Technologies and Criminal Law: Criminalizing Cyberbullying? 2009.

219. Dittrick CJ. Does appearance matter? School bullying and body-esteem in early adolescence. 2010.

220. Dittrick CJ, Beran TN, Mishna F, Hetherington R, Shariff S. Do Children Who Bully Their Peers Also Play Violent Video Games? A Canadian National Study. *J Sch Violence*. 2013;12(4):297-318. doi:10.1080/15388220.2013.803244.

221. Duchesne A. Unis dans l'action: Programme d'intervention visant à prévenir l'intimidation au secondaire. 2012.

222. Erdur-Baker O. Cyberbullying and its correlation to traditional bullying, gender and frequent and risky usage of internet-mediated communication tools. *New Media Soc*. 2010;12(1):109-125. doi:10.1177/1461444809341260.

223. Ford DP. Virtual harassment : media characteristics ' role in psychological health. *J Manag Psychol*. 2013;28:408-428. doi:10.1108/JMP-12-2012-0398.

224. Giguère C, Vitaro F, Boivin M, Desrosiers H, Brendgen MR. *Peer Victimization from Kindergarten to Grade 2*. Vol 5. Québec, Québec; 2011.

225. Granich AL. "I get by with a little help from my friends": Bullying and the protective and moderating role of friendship quality. 2008.

226. Jaffer MSB, Brazeau P. *Cyberbullying Hurts: Respect for Rights in the Digital Age*. Ottawa, Ontario; 2012.

227. Kraft E. Cyberbullying: A worldwide trend of misusing technology to harass others. In: *WIT Transactions on Information and Communication Technologies*. Vol 36. ; 2006:155-166. doi:10.2495/IS060161.

228. Law DM. Social Responsibility on the Internet: a Socio-Ecological Approach To Online Aggression. 2009;(April).

229. Law DM, Shapka JD, Olson BF. To control or not to control? Parenting behaviours and adolescent online aggression. *Comput Human Behav*. 2010;26(6):1651-1656. doi:10.1016/j.chb.2010.06.013.

230. Law DM, Shapka JD, Domene JF, Gagné MH. Are Cyberbullies really bullies? An investigation of reactive and proactive online aggression. *Comput Human Behav*. 2012;28(2):664-672. doi:10.1016/j.chb.2011.11.013.

231. Law DM, Shapka JD, Hymel S, Olson BF, Waterhouse T. The changing face of bullying: An empirical comparison between traditional and internet bullying and victimization. *Comput Human Behav*. 2012;28(1):226-232. doi:10.1016/j.chb.2011.09.004.

232. Leenaars LS. "It is far safer to be feared than loved ": Why do some individuals become bullies and others bully-victims? 2012.

233. Lennox-Shapiro G. Adolescent loneliness: The roles of social support and victimizing behavior. 2005.

234. Li Q. Cyberbullying in Schools: Nature and Extent of Canadian Adolescents' Experience. In: *Paper Presented at the Annual Conference of AERA*. Vol Montreal, Quebec; 2005. http://files.eric.ed.gov/fulltext/ED490641.pdf.

235. Li Q. Cyber-bullying in schools: A comparison of Canadian and Chinese adolescents' experience. In: Richards G, ed. *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2005*. Vol Chesapeake, VA: AACE; 2005:878-884. http://www.editlib.org/p/21291.

236. Li Q. Cyberbullying in schools: An examination of preservice teachers' perception. *Can J Learn Technol*. 2008;34. http://www.cjlt.ca/index.php/cjlt/article/view/494/225.

237. Li Q. Cyberbullying in High Schools: A study of students' behaviors and beliefs about this new phenomenon. *J Aggress Maltreatment, Trauma*. 2010;19(4):372-392.

238. Mason KL. Cyberbullying: A preliminary assessment for school personnel. *Psychol Sch*. 2008;45(4):323-348. doi:10.1002/pits.20301.

239. Mishna F, Khoury-Kassabri M, Gadalla T, Daciuk J. Risk factors for involvement in cyber bullying: Victims, bullies and bully–victims. *Child Youth Serv Rev*. 2012;34(1):63-70. doi:10.1016/j.childyouth.2011.08.032.

240. Mishna F, Cook C, Saini M, Wu M-J, MacFadden R. Interventions for children, youth, and parents to prevent and reduce cyber abuse. *Cambell Syst Rev*. 2009;2. doi:10.4073/csr.2009.2.

241. Nordahl J, Beran TN, Dittrick CJ. Psychological Impact of Cyber-Bullying : Implications for School Counsellors. *Can J Couns Psychother*. 2013;47(3):383-402.

242. Pierzchala D, Beck K. The Internet A New School Yard For Bullies? *Ipsos News Polls*. 2012. http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=5556.

243. Polihronis C. Combining ecological and moral disengagement theories: The impact of individual and school-level perceptions on self-reports of bullying, victimization, and witnessing. 2012.

244. Rinaldi C. *Peer Bullying: An Examination of Parents' and Adolescents' Knowledge and Communication*. Edmonton, Alberta; :1-34. http://www.research4children.com/data/documents/ACCFCR08SMFinalReport1pdf.pdf.

245. Runions K, Shapka JD, Dooley J, Modecki K. Cyber-aggression and victimization and social information processing: Integrating the medium and the message. *Psychol Violence*. 2013;3(1):9-26. doi:10.1037/a0030511.

246. Ryan N. Les effets de la cyberintimidation sur les filles qui en sont la cible. 2011.

247. Ryan N. Intimidation à l'heure d'internet. In: Fortin F, ed. *Cybercriminalité: Entre Inconduite et Crime Organisé*. Vol Montreal, Quebec: Presses internationales Polytechnique; 2013:157-182.

248. Shapka JD, Law DM. Does one size fit all? Ethnic differences in parenting behaviors and motivations for adolescent engagement in cyberbullying. *J Youth Adolesc*. 2013;42(5):723-738. doi:10.1007/s10964-013-9928-2.

249. Sokal L. Understanding and responding to adolescent girls' online cruelty. *Can J Couns Psychother*. 2012;46(2):107-121.

250. Sugarman DB, Willoughby T. Technology and violence: Conceptual issues raised by the rapidly changing social environment. *Psychol Violence*. 2013;3(1):1-8. doi:10.1037/a0031010.

251. Shumka E. The social facilitation of bullying: A multilevel analysis. 2012;(October).

252. Vandekamp KJO. The social experiences of secondary students with intellectual and learning disabilities: School safety, victimization, risk-taking, and feelings of belonging. 2013;(January).

253. Wright VH, Burnham JJ, Inman CT, Ogorchock HN. Cyberbullying: Using Virtual Scenarios to Educate and Raise Awareness. *J Comput Teach Educ*. 2009;26(1):35-43.

254. Chen L-M, Cheng Y-Y. Prevalence of school bullying among secondary students in Taiwan: Measurements with and without a specific definition of bullying. *Sch Psychol Int*. 2013;34(6):707-720. doi:10.1177/0143034313479694.

255. Trach J. Witnessing Bullying at School: The Influence of Bullying and Victimization on Bystander Behaviour. 2011;(July). https://circle.ubc.ca/bitstream/handle/2429/36465/ubc_2011_fall_trach_jessica.pdf?sequence=6.

256. Environics Research Group. *Young Canadians in a Wired World: The Students' View*. Ottawa, Ontario; 2001. http://mediasmarts.ca/sites/default/files/pdfs/publication-report/full/YCWWI-student-view.pdf. Accessed August 16, 2013.

257. Toronto District School Board. TDSB Students and families: Demographic profile. *Toronto Dist Sch Board Facts*. 2013;(Spring 2012):1-4. http://www.tdsb.on.ca/Portals/0/AboutUs/Research/2011-12CensusFactSheet1-Demographics-17June2013.pdf.

APPENDIX A: CONCEPT MAP

Search statement - I am looking for articles to answer the question:

What is the prevalence of cyberbullying (victimization & perpetration) in Canadian youth?

After writing out the question, underline the key concepts. Decide how the concepts will be combined together using the AND and OR Boolean operators. Concepts to be ANDed go across the grid and terms to be ORed go down the grid.

Fill in the grid with the key concepts and possible synonyms for each concept. Add subject headings first (where applicable).

Table 1. Concept map for English-language search

	Concept 1	AND	**Concept 2**	AND	**Concept 3**
	Concept: *The Electronic Medium*		Concept: *Bully or Victim*		Concept: *Canadian Subjects*
	Cyber		(Bullying OR bullies OR bullied)		Canada
OR	Electronic		Harrass*		Canadian
OR	Computer		Intimidat*		Nova Scotia OR Newfoundland OR Labrador OR Prince Edward Island Or New Brunswick OR Quebec OR Ontario OR Saskatchewan OR Manitoba OR Alberta OR British Columbia OR Northwest Territories Or Yukon OR Nunavut
OR	Internet		Aggress*		
OR	Virtual		Victim*		
OR	Online				
OR	Phone				
OR	Cyberbull*				
OR	Cyber-bull*				
OR	Cyber-victim*				

Synonyms

Form creation credit: Robin Featherstone

Questions: contact Robin Parker, robin.parker[at]dal.ca

Table 2. Concept map for French-language search

	Concept 1	AND	Concept 2	AND	Concept 3
	Concept: *The Electronic Medium*		Concept: *Bully or Victim*		Concept: *Canadian Subjects*
	(En ligne) OR (sur ligne) OR (sur internet)		Tyran*		Canada
OR	Électronique		Brut*		Canadien*
OR	Ordinateur		Intimid*		Nouvelle-Écosse OR Terre-Neuve OR Labrador OR Île du Prince Édouard OR Nouveau-Brunswick OR Québec OR Ontario OR Saskatchewan OR Manitoba OR Alberta OR Colombie-Britannique OR territoires du Nord-Ouest OR Yukon OR Nunavut
OR	Internet		Agress*		
OR	Virtuel		Tourment		
OR	Téléphone		Malmen*		
OR	Portable OR Cellulaire		Brim*		
OR	Cyber OR Cybernétique		Harcèl*		
OR			Persécut*		
OR			Victim*		
OR			Brimad*		
OR			Tracass*		
OR	Cyberbull*				
OR	Cyber-bull*				
OR	Cyber-victim*				
OR	Cyberintimid*				
OR	Cyber-intimid*				
OR	Cyber-agress*				
OR	Cyberagress*				
OR	Cyberbrimad*				
OR	Cyber-brimad*				
OR	Cyber-harcèl*				
OR	Cyberharcèl*				
OR	Cyberpersécut*				
OR	Cyber-persécut*				
OR	Cyber-tracass*				

Synonyms

APPENDIX B: BOOLEAN SEARCH STRINGS

English Search

Search Strategy 1: (cyber OR electronic OR computer OR internet OR virtual OR online OR phone) AND (harass* OR intimidat* OR aggress* OR victim* OR bullying OR bullies OR bullied) AND (Canada OR Canadian OR Nova Scotia OR Newfoundland OR Labrador OR Prince Edward Island OR New Brunswick OR Quebec OR Ontario OR Saskatchewan OR Manitoba OR Alberta OR British Columbia OR Northwest Territories OR Yukon OR Nunavut)

No wildcards (*) version: (cyber OR electronic OR computer OR internet OR virtual OR online OR phone) AND (harass OR harassment OR harassed OR harrassing OR intimidate OR intimidated OR intimidation OR intimidating OR aggress OR aggression OR aggressive OR aggressed OR victim OR victimized OR victimization OR victimizing OR bullying OR bullies OR bullied) AND (Canada OR Canadian OR Nova Scotia OR Newfoundland OR Labrador OR Prince Edward Island OR New Brunswick OR Quebec OR Ontario OR Saskatchewan OR Manitoba OR Alberta OR British Columbia OR Northwest Territories OR Yukon OR Nunavut)

Search Strategy 2: (cyberbull* OR cyber-bull* OR cyber-victim) AND (Canada OR Canadian OR Nova Scotia OR Newfoundland OR Labrador OR Prince Edward Island OR New Brunswick OR Quebec OR Ontario OR Saskatchewan OR Manitoba OR Alberta OR British Columbia OR Northwest Territories OR Yukon OR Nunavut)

No wildcards (*) version: (cyberbully OR cyberbullies OR cyberbullied OR cyberbullying OR cyber-bully OR cyber-bullies OR cyber-bullied OR cyber-bullying OR cybervictim OR cybervictimized OR cybervictimization OR cybervictimizing OR cyber-

victim OR cyber-victimized OR cyber-victimization OR cyber-victimizing) AND (Canada OR Canadian OR Nova Scotia OR Newfoundland OR Labrador OR Prince Edward Island OR New Brunswick OR Quebec OR Ontario OR Saskatchewan OR Manitoba OR Alberta OR British Columbia OR Northwest Territories OR Yukon OR Nunavut)

French Search

Search Strategy 1: (cyber OR cybérnetique OR "en ligne" OR "sur ligne" OR "sur internet" OR ordinateur OR internet OR virtuel OR telephone OR portible OR cellulaire) AND (tyran* OR brut* OR intimid* OR agress* OR tourment OR malmen* OR brim* OR harcèl* OR persécut* OR victim* OR tracass*) AND (Canada OR Canadien* OR Nouvelle-Écosse OR Terre-Neuve OR Labrador OR Île du Prince Édouard OR Nouveau-Brunswick OR Québec OR Ontario OR Saskatchewan OR Manitoba OR Alberta OR Colombie-Britannique OR territoires du Nord-Ouest OR Yukon OR Nunavut)

No wildcards (*) version: (cyber OR cybérnetique OR "en ligne" OR "sur ligne" OR "sur internet" OR ordinateur OR internet OR virtuel OR telephone OR portible OR cellulaire) AND (tyran OR tyranniser OR tyrannisé OR tyrannisation OR brute OR brutaliser or brutalisé OR brutalisation OR intimidateur OR intimidatrice OR intimidé OR intimidation OR aggression OR agresseur OR agresser OR agressé OR tourmenter OR tourmenté OR malmener OR malmené OR brimade OR brimades OR brimer OR brimé OR harcèlement OR harcèler OR harcèlé OR harcèleur OR harcèleuse OR persécution OR persécuter OR persécuté OR persécuteur OR persécutrice OR victime OR victimiser OR victimisé OR tracasserie *OR* tracasseries OR tracasser OR tracassé) AND (Canada OR Canadien OR Canadienne OR Nouvelle-Écosse OR Terre-Neuve OR Labrador OR Île du Prince Édouard OR Nouveau-Brunswick OR Québec OR Ontario OR Saskatchewan OR

Manitoba OR Alberta OR Colombie-Britannique OR territoires du Nord-Ouest OR Yukon OR Nunavut)

Search Strategy 2: (cyberbull* OR cyber-bull* OR cyber-victim* OR cyber-intimid* OR cyber-intimid* OR cyber-aggress* OR cyberaggress* OR cyberbrimad* OR cyber-brimad* OR cyberharcèl* OR cyber-harcèl OR cyber-tracass*) AND (Canada OR Canadien* OR Nouvelle-Écosse OR Terre-Neuve OR Labrador OR Île du Prince Édouard OR Nouveau-Brunswick OR Québec OR Ontario OR Saskatchewan OR Manitoba OR Alberta OR Colombie-Britannique OR territoires du Nord-Ouest OR Yukon OR Nunavut)

No wildcards (*) version: (cyberbully OR cyberbullying OR cyber-bully OR cyber-bullying OR cybervictime OR cybervictimiser OR cybervictimisé OR cyber-victime OR cyber-victimiser OR cyber-victimisation OR cyber-victimisé OR cyberintimidation OR cyberintimidateur OR cyberintimidatrice OR cyberintimidé OR cyber-intimidation OR cyber-intimidateur OR cyber-intimidatrice OR cyber-intimidé OR cyberagression OR cyberagresseur OR cyberagressé OR cyber-agression OR cyber-agresseur OR cyber-agressé OR cyberbrimade OR cyberbrimades OR cyberbrimer OR cyberbrimé OR cyber-brimade OR cyber-brimades OR cyber-brimer OR cyber-brimé OR cyberharcèlement OR cyberharcèler OR cyberharcèlé OR cyberharcèleur OR cyberharcèleuse OR cyber-harcèlement OR cyber-harcèler OR cyber-harcèlé OR cyber-harcèleur OR cyber-harcèleuse OR cyberpersécution OR cyberpersécuter OR cyberpersécuté OR cyberpersécuteur OR cyberpersécutrice OR cyber-persécution OR cyber-persécuter OR cyber-persécuté OR cyber-persécuteur OR cyber-persécutrice OR cybertracasserie OR cybertracasseries OR cybertracasser OR cybertracassé OR cyber-tracasserie OR cyber-tracasseries OR cyber-tracasser OR cyber-tracassé) AND (Canada OR Canadien OR

Canadienne OR Nouvelle-Écosse OR Terre-Neuve OR Labrador OR Île du Prince Édouard OR Nouveau-Brunswick OR Québec OR Ontario OR Saskatchewan OR Manitoba OR Alberta OR Colombie-Britannique OR territoires du Nord-Ouest OR Yukon OR Nunavut)

APPENDIX C: DATABASE DESCRIPTIONS

Canadian Electronic Library

Description: Three collections within the Canadian Electronic Library are available to Dalhousie users. The Canadian Publishers Collection provides online access to non-fiction and reference books from Canadian commercial publishers as well as from non-profit and public-sector organizations. The Canadian Public Policy Collection is a collection of monograph publications from Canadian public policy institutes, government agencies, advocacy groups, think-tanks, university research centres and other public interest groups. The organizations included in this collection represent the leading edge of primary research and opinion in all areas of Canadian public policy. Their publications are vital to the understanding of developing issues in every arena of Canadian public life. The Canadian Health Research Collection is a collection of monograph publications from Canadian research institutes, government agencies and university centres working in the area of health and medical research. The organizations included in this collection are very active publishers of primary research in the field. The publications included are both general policy documents as well as those of a specialized technical nature.

— *Description provided by eSearch@Dal*[185]

CINAHL

Description: CINAHL is a core resource for nursing and allied health professionals, students, educators and researchers. This database provides indexing for 1,835 journals from the fields of nursing and allied health and contains more than 1,000,000 records dating back to 1982.

— *Description provided by Dalhousie Libraries*[186]

Google Scholar

Description: Google Scholar provides a simple way to broadly search for scholarly literature. From one place, you can search across many disciplines and sources: articles, theses, books, abstracts and court opinions, from academic publishers, professional societies, online repositories, universities and other web sites. Google Scholar helps you find relevant work across the world of scholarly research.

— Description provided by Google[187]

Library and Archives Canada (Theses)

Description: The mission of Theses Canada is to acquire and preserve a comprehensive collection of Canadian theses at Library and Archives Canada (LAC), to provide access to this valuable research within Canada and throughout the world. Its mission to preserve this portion of Canada's bibliographic heritage is achieved through collaboration with the many Canadian universities who participate in the program. Canadian universities participate in the program voluntarily by submitting approved theses and dissertation to Theses Canada.

— Description provided by Library and Archives Canada[188]

PAIS International

Description: This resource covers issues in the public debate through selective coverage of a wide variety of international sources including journal articles, books, government documents, statistical directories, grey literature, research reports, conference papers, web content, and more. PAIS International is the current file covering 1972 to present, and PAIS Archive includes the content from printed volumes published 1915-1976.

— Description provided by ProQuest[189]

PsycINFO

Description: Key database for Psychology. Covers the academic, research and practice literature in psychology from over 45 countries in more than 30 languages. PsycINFO includes relevant materials from related disciplines such as medicine, psychiatry, education, social work, law, criminology, social science, and organizational behavior. It is an essential tool for researchers, practitioners, and students in psychology and related disciplines. Provides indexes to journals, dissertations, book chapters, books, technical reports, and other documents from 1887 to the present.

— *Description provided by Dalhousie Libraries*[190]

PubMED

PubMed comprises over 22 million citations for biomedical literature from MEDLINE, life science journals, and online books. PubMed citations and abstracts include the fields of biomedicine and health, the life sciences, behavioral sciences, chemical sciences, and bioengineering. PubMed also provides access to additional relevant web sites and links to the other NCBI molecular biology resources. PubMed is a developed and maintained by the National Center for Biotechnology Information (NCBI), at the U.S. National Library of Medicine (NLM), located at the National Institutes of Health (NIH).

— *Description provided by the NCBI*[191]

Social Services Abstracts

Description: Provides bibliographic coverage of current research focused on social work, human services and related areas, including social welfare, social policy and community development. The database abstracts and indexes thousands of serials publications and includes abstracts of journal articles, dissertations, and book reviews.

— *Description provided by ProQuest*[192]

Web of Science

Description: Includes *Science Citation Index - Expanded* covering over 5,600 journals, *Social Sciences Citation Index* covering 1,700 journals and selectively covering relevant items from over 5,600 leading science and social sciences journals and *Arts & Humanities Citation Index* covering over 1,140 journals and selectively covering relevant items from over 7,000 leading science and social databases.

— *Description provided by Dalhousie Libraries*[193]

APPENDIX D: RISK OF BIAS TOOL

Name of author(s): _____
Year of publication:_____

This tool is designed to assess the risk of bias in population-based prevalence studies. Please read the additional notes for each item when initially using the tool. Note: If there is insufficient information in the article to permit a judgement for a particular item, please answer No (HIGH RISK) for that particular item.

Table 4. Risk of bias tool

Risk of bias item	Criteria for answers (please circle one)	Additional notes and examples
External validity		
1. Was the study's target population a close representation of the national population in relation to relevant variables, e.g. age, sex	• **Yes (LOW RISK):** The study's target population was a close representation of the national population • **No (HIGH RISK):** The study's target population was clearly NOT representative of the national population	The **target population** refers to the group of people or entities to which the results of the study will be generalised. Examples: • The study was a national health survey of people 15 years and over and the sample was drawn from a list that included all individuals in the population aged 15 years and over. The answer is: **Yes (LOW RISK).** • The study was conducted in one province only, and it is not clear if this was representative of the national population. The answer is: **No (HIGH RISK).** • The study was undertaken in one village only and it is clear this was not representative of the national population. The answer is: **No (HIGH RISK).**
2. Was the sampling frame a **true or close Representation** of the target population?	• **Yes (LOW RISK):** The sampling frame was a **true or close** representation of the target population. • **No (HIGH RISK)**: The sampling frame was NOT a **true or close**	The **sampling frame** is a list of the sampling units in the target population and the study sample is drawn from this list. Examples: • The sampling frame was a list of almost every individual within the target population. The answer is: **Yes (LOW RISK)**.

Risk of bias item	Criteria for answers (please circle one)	Additional notes and examples
	representation of the target population.	• The cluster sampling method was used and the sample of clusters/villages was drawn from a list of all villages in the target population. The answer is: **Yes (LOW RISK)**. • The sampling frame was a list of just one particular ethnic group within the overall target population, which comprised many groups. The answer is: **No (HIGH RISK).**
3. Was some form of **random selection** used to select the sample, OR, was a census undertaken?	• **Yes (LOW RISK):** A census was undertaken, OR, some form of random selection was used to select the sample (e.g. simple random sampling, stratified random sampling, cluster sampling, systematic sampling). • **No (HIGH RISK)**: A census was NOT undertaken, AND some form of random selection was NOT used to select the sample.	A census collects information from every unit in the sampling frame. In a survey, only part of the sampling frame is sampled. In these instances, random selection of the sample helps minimise study bias. Examples: • The sample was selected using simple random sampling. The answer is: **Yes (LOW RISK)**. • The target population was the village and every person in the village was sampled. The answer is: **Yes (LOW RISK)**. • The nearest villages to the capital city were selected in order to save on the cost of fuel. The answer is: **No (HIGH RISK).**
4. Was the likelihood of **non-response bias minimal?**	• **Yes (LOW RISK):** The response rate for the study was >/=75%, OR, an analysis was performed that showed no significant difference in relevant demographic characteristics between responders and nonresponders • **No (HIGH RISK)**: The response rate was <75%, and if any analysis comparing responders and non-	Examples: • The response rate was 68%; however, the researchers did an analysis and found no significant difference between responders and non-responders in terms of age, sex, occupation and socioeconomic status. The answer is: **Yes (LOW RISK)**. • The response rate was 65% and the researchers did NOT carry out an analysis to compare relevant demographic characteristics between responders and non-responders. The answer is: **No (HIGH RISK)**.

Risk of bias item	Criteria for answers (please circle one)	Additional notes and examples
	responders was done, it showed a significant difference in relevant demographic characteristics between responders and non-responders.	• The response rate was 69% and the researchers did an analysis and found a significant difference in age, sex and socio-economic status between responders and non-responders. The answer is: **No (HIGH RISK)**.
Internal validity		
5. Were data collected **directly from the subjects** (as opposed to a proxy)?	• **Yes (LOW RISK):** All data were collected directly from the subjects. • **No (HIGH RISK)**: In some instances, data were collected from a proxy.	A proxy is a representative of the subject. Examples: • All eligible subjects in the household were interviewed separately. The answer is: **Yes (LOW RISK)**. • A representative of the household was interviewed and questioned about the presence of low back pain in each household member. The answer is: **No (HIGH RISK)**.
6. Was an acceptable case definition used in the study? *The three canonical definitional criteria are 1) intent to harm 2) repetition, and 3) a more physically or psychologically powerful perpetrator. Base your judgment on the actual survey instrument rather than other parts of the paper.* *Note that Vaillancourt et al. (2008) do not classify words like 'mean', or 'hurtful' as intent (i.e., 'mean messages' may be misinterpreted friendly teasing). Look instead for terms like 'intended to hurt'.*	• **Yes (LOW RISK):** An acceptable case definition was used. • **No (HIGH RISK)**: An acceptable case definition was NOT used.	Examples: • For a study on low back pain, the following case definition was used: "Low back pain is defined as activity-limiting pain lasting more than one day in the area on the posterior aspect of the body from the bottom of the 12th rib to the lower gluteal folds." The answer is: **Yes (LOW RISK)**. • For a study on back pain, there was no description of the specific anatomical location back referred to. The answer is: **No (HIGH RISK)**. • For a study on osteoarthritis, the following case definition was used: "Symptomatic osteoarthritis of the hip or knee, radiologically confirmed as Kellgren-Lawrence grade 2-4". The answer is: **Yes (LOW RISK)**.

Risk of bias item	Criteria for answers (please circle one)	Additional notes and examples
7. Was the study instrument that measured the parameter of interest (e.g. prevalence of low back pain) shown to have **reliability and validity (if necessary)**?	• **Yes (LOW RISK):** The study instrument had been shown to have reliability and validity (if this was necessary), e.g. test-retest, piloting, validation in a previous study, etc. • **No (HIGH RISK)**: The study instrument had NOT been shown to have reliability or validity (if this was necessary).	Examples: • The authors used the COPCORD questionnaire, which had previously been validated. They also tested the inter-rater reliability of the questionnaire. The answer is: **Yes (LOW RISK)**. • The authors developed their own questionnaire and did not test this for validity or reliability. The answer is: **No (HIGH RISK)**.
8. Was the **same mode of data collection** used for all subjects? *Data should be collected over a span of no more than 2 adjacent months (e.g., March-April).*	• **Yes (LOW RISK):** The same mode of data collection was used for all subjects. • **No (HIGH RISK)**: The same mode of data collection was NOT used for all subjects.	The mode of data collection is the method used for collecting information from the subjects. The most common modes are face-to-face interviews, telephone interviews and self-administered questionnaires. Examples: • All eligible subjects had a face-to-face interview. The answer is: **Yes (LOW RISK)**. • Some subjects were interviewed over the telephone and some filled in postal questionnaires. The answer is: **No (HIGH RISK)**.
9. Was the **length of the shortest prevalence period** for the parameter of interest appropriate? *Olweus uses a two month measure of prevalence. Anything up to 3 months is fine.*	• **Yes (LOW RISK):** The shortest prevalence period for the parameter of interest was appropriate (e.g. point prevalence, one-week prevalence, one-year prevalence). • **No (HIGH RISK)**: The shortest prevalence period for the parameter of interest was not appropriate (e.g. lifetime prevalence)	The prevalence period is the period that the subject is asked about e.g. "Have you experienced low back pain over the previous year?" In this example, the prevalence period is one year. The longer the prevalence period, the greater the likelihood of the subject forgetting if they experienced the symptom of interest (e.g. low back pain). Examples: • Subjects were asked about pain over the past week. The answer is: **Yes (LOW RISK)**. • Subjects were only asked about pain over the past three years. The answer is: **No (HIGH RISK)**.

Risk of bias item	Criteria for answers (please circle one)	Additional notes and examples
10. Were the **numerator(s) and denominator(s)** for the parameter of interest appropriate? *Note that 'bully-victims' should be included in counts of both victims and perpetrators.*	• **Yes (LOW RISK):** The paper presented appropriate numerator(s) AND denominator(s) for the parameter of interest (e.g. the prevalence of low back pain). • **No (HIGH RISK)**: The paper did present numerator(s) AND denominator(s) for the parameter of interest but one or more of these were inappropriate.	There may be errors in the calculation and/or reporting of the numerator and/or denominator. Examples: • There were no errors in the reporting of the numerator(s) AND denominator(s) for the prevalence of low back pain. The answer is: **Yes (LOW RISK)**. • In reporting the overall prevalence of low back pain (in both men and women), the authors accidentally used the population of women as the denominator rather than the combined population. The answer is: **No (HIGH RISK).**
Summary item on the overall risk of study bias		
• **LOW RISK OF BIAS:** Further research is very unlikely to change our confidence in the estimate. • **MODERATE RISK OF BIAS:** Further research is likely to have an important impact on our confidence in the estimate and may change the estimate. • **HIGH RISK OF BIAS:** Further research is very likely to have an important impact on our confidence in the estimate and is likely to change the estimate.		

APPENDIX E: DATA ABSTRACTION FORM

Use this form to collect data from the studies you were assigned. If you are including more than one prevalence rate from a particular study (e.g., more than one measure with the same sample or more than one sample in the study) please complete a separate form for each prevalence rate.

Study Information
Authors' surnames:

Year of publication:

Date (month/year) data were collected:

Sample Information
Province/territory:

Sample size:

How was the sample selected?:

If the sample was school-based, was consent active or passive?:
Note: Active consent requires students and parents of minor students to consent to participation; *i.e., opt-in. In the case of passive consent, school authorities will survey all selected students unless the student/parent withdraws; i.e. opt-out.*

Response rate(s):
Note: Depending on the methods and scope of the research, response rates may be available at the level of the board, school, and parent/student.

Age range:

Grade range:

Sex (% female):

Prevalence Information
Duration of prevalence estimate (s):
E.g., 'Past month', 'past year', 'since September', 'ever'

Definition of cyberbullying:

Did the definition/measure specify intent? (Y/N)
Note: According to Vaillancourt et al. (2008), indicators of negativity such as 'being mean' do not qualify as intent. Look for words such as 'intentionally' and 'on purpose'.

Did the definition/measure specify repetition? (Y/N)

Did the definition/measure specify a difference in power? (Y/N)
Note: A stronger perpetrator/weaker victim

What *sources* did the definition/measure indicate? (e.g., e-mail, text message, Facebook):

What *behaviours* did the definition/measure indicate? (e.g., spreading rumours, name-calling):

Was the measure *restricted* to the sources/behaviours indicated above? Y/N
Note: 'Have you been cyberbullied by text message' is a restricted measure that only applies to text message bullying (e.g., it excludes internet bullying). 'Have you been cyberbullied, e.g. through text message' is not restricted (e.g, it does not exclude internet bullying).

Percentage of sample who were cyber-victims:
Note: If presented separately, combine bully-victims with exclusive victims

Percentage of sample who were cyber-bullies:
Note: If presented separately, combine bully-victims with exclusive bullies

Frequency Breakdown
If the study provided a frequency breakdown, please provide the percentage of students who were victims at each frequency level (e.g., often/sometime/rarely or monthly/weekly/daily):

If the study provided a frequency breakdown, please provide the percentage of students who were bullies at each frequency level (e.g., often/sometime/rarely or monthly/weekly/daily):

Age/Grade Differences
If available, report the percentage of cyber-victims at each age/grade level:

Did the study compare age/grade differences in the prevalence of cyber-victimization? (Y/N)

If yes, what was compared?

Report the test statistic and DF:

Report the p-value:

If available, report the percentage of cyber-bullies at each age/grade level:

Did the study compare age/grade differences in the prevalence of cyberbullying perpetration? (Y/N)

If yes, what was compared?

Report the test statistic and DF:

Report the p-value:

Sex Differences
If available, report the percentage of females who were cyber-victims:

If available, report the percentage of males who were cyber-victims:

Did the study compare the prevalence of cyber-victimization between females and males? (Y/N)

Test statistic and DF:

P-Value:

If available, report the percentage of females who were cyberbullies:

If available, report the percentage of males who were cyberbullies:

Did the study compare the prevalence of cyberbullying perpetration between females and males? (Y/N)

Test statistic and DF:

P-Value:

Offline Bullying
Did the study also measure the prevalence of offline victimization? (general/verbal/social/physical) (Y/N)

If available, report the percentage of offline victims
General: Verbal: Social: Physical:

Did the study also measure the prevalence of offline perpetration? (general/verbal/social/physical) (Y/N)

If available, report the percentage of offline bullies
General: Verbal: Social: Physical:

Comments:

APPENDIX F: EXCLUDED STUDIES

Table 5. Table of excluded studies

Study	Reason for Exclusion
Aftab (n.d.)[194]	*Measure.* This blog post by an internet safety advocate claimed that "in Canada, 100% of the students at an exclusive boarding school admitted to having been cyberbullied". This was based on the author's subjective impression of raised hands at a school assembly.
Baek & Bullock (2009)[195]	*Measure.* This review article did not cite unique Canadian data.
Bailey (2013)[196]	*Measure.* This review article did not cite unique Canadian data.
Barrett (2009)[197]	*Republication.* Based on the same data as included study by Pettalia (2013)
Bauman(2008)[198]	*Measure.* This review article did not cite unique Canadian data.
Bauman & Pero (2011)[199]	*Sample.* This comparison study of bullying and cyberbullying in deaf versus hearing children did not include Canadian subjects.
Bedard (2008)[200]	*Measure.* This study of 261 elementary school students in Quebec measured offline bullying, but not cyberbullying.
Beran & Li (2005)[123]	*Republication.* Based on the same data as included study by Beran & Li (2007)
Bérubé (2011)[201]	*Measure.* This intervention study of a small sample of elementary school students in Quebec measured offline bullying, but not cyberbullying.
Bonanno (2006)[202]	*Republication.* Based on the same data as included study by Bonanno & Hymel (2013)
Brenner & Rehberg (2009)[203]	*Measure.* This article, which considered the role of legislation in preventing cyberbullying, did not collect or cite Canadian data.
Brown et al. (2006)[204]	*Measure.* This article, which considered policies for addressing cyberbullying, did not cite unique Canadian data.
Brunstein Klomek et al. (2010)[205]	*Measure.* This review article on the relationship between bullying, cyberbullying, and suicide did not cite Canadian data.
Butler et al. (2009)	*Measure.* This article, which considered the role of legislation in preventing cyberbullying, did not collect or cite Canadian data.
Calvete et al. (2010)[206]	*Sample.* This article, which presented a 16-item instrument to measure cyberbullying prevalence, did not include Canadian subjects.

Study	Reason for Exclusion
Campbell (2005)[65]	*Measure*. This review paper about cyberbullying did not present primary data, and did not cite Canadian prevalence rates.
Cappadocia et al. (2013)[35]	*Republication.* Based on the same data as included study by Cappadocia (2008)
Cassidy et al. (2013)	*Measure*. This review paper about cyberbullying did not cite unique Canadian data.
CEST (2009)[207]	*Measure.* This report by the Quebec Commission de L'éthique de la Science et de la Technologie reported qualitative data about cyberbullying collected from focus groups with youth, but did not measure prevalence.
Çetin et al. (2012)[208]	*Sample.* This study of 258 high school students in Turkey did not include Canadian subjects.
Chamberland (2011)[209]	*Republication.* Based on the same data as excluded study by Chamberland (2013)
Chamberland (2013)[210]	*Measure.* This study of 2747 Quebec public school students measured homophobic victimization. The survey only measured cyber-victimization that occurred because the victim was (or was thought to be) lesbian, gay, or bisexual. This measure is too restricted.
Christofides et al. (2012)[211]	*Measure.* This study featured a convenience sample of 256 young people attending a science center in Toronto who identified as Facebook users. They were surveyed about negative experiences on Facebook, and researchers labelled some of those experiences as bullying/meanness (at their own discretion). The measure was too restricted and was not self-reported.
Cliche (2011)[212]	*Not available.* This newspaper article stated that survey data from students in a secondary school in Mephremagog, Quebec, showed that prevalence of cyberbullying was increasing; however, the prevalence value was not reported. Email inquiry sent to Vincent Cliche June 13, 2014. Author responded but could not provide access to data.
Cloutier (2009)[213]	*Measure.* This intervention study of a small sample of elementary school students in Quebec featured qualitative data about attitudes and did not measure cyberbullying.
Craig & Edge (2011)[214]	*Not available.* Chapter 11 of a 2011 report by the Public Health Agency of Canada, *The Health of Canada's Young People: A Mental Health Focus*, was about bullying and fighting. This section summarized the results of the Canadian subsample of the 2009/10 cycle of the Health Behaviors in School-Aged Children study. The chapter reported that about 16% of youth who identified as exclusive victims of bullying were cyberbullied, but this value did not include the much larger group of students who identified as both bullies and victims. Email inquiries requesting the prevalence of cyber-

Study	Reason for Exclusion
	victimization and perpetration as a percentage of the total sample were sent to Heather McCuaig Edge on June 16 2014 and Wendy Craig on July 14, 2014. No responses were obtained.
CROP (2011)[215]	*Sample.* This report, commissioned by the Centrale des syndicats du Québec (CSQ; a trade union for workers in the field of education) measured the prevalence of cybervictimization in an adult sample of teachers and school staff in 2008 and 2011.
Cross et al. (2012)[216]	*Measure.* This review did not cite unique Canadian data.
Cyr et al. (2012)[217]	*Measure.* This study measured different forms of offline victimization in a child welfare sample from Quebec.
Di Manno (2009)[218]	*Measure.* This paper, which considered the role of legislation in preventing cyberbullying, did not collect or cite unique Canadian data.
Dittrick (2010)[219]	*Not available.* This study of 801 grade 6-8 students in BC reported the means and standard deviations for cyberbullying victimization on a 5-point Likert scale. I contacted the author to request the prevalence value as a dichotomized proportion. The author responded to an email inquiry sent on June 26th 2014 and corresponded further, but did not ultimately follow through with the data.
Dittrick et al. (2013)[220]	*Republication.* Based on the same data as included study by Stanton (2011)
Dooley et al. (2009)	*Measure.* This review did not cite unique Canadian data.
Doucette (2013)[156]	*Republication.* Based on the same data as included study by Pandori (2013)
Duchesne (2012)[221]	*Measure.* This intervention study of a small sample of elementary school students in Quebec focused on changes in awareness about bullying but did not measure cyberbullying.
Edur-Baker(2010)[222]	*Sample.* This article, which focused on the role of gender and internet use in cyberbullying, did not include Canadian subjects.
Ford (2013)[223]	*Sample.* This study of workplace virtual harassment in 492 US and Canadian citizens did not include children or youth.
Giguère et al. (2011)[224]	*Measure.* This report of results from the Quebec Longitudinal Study of Child Development (1998-2010) only assessed offline peer victimization.
Granich (2008)[225]	*Measure.* This study of 246 grade 6-8 students in Ontario measured the physical and social forms of offline bullying.
Hamilton (2012)[22]	*Republication.* This news report states that "Canadian research puts the prevalence at 19%". The unreferenced comment likely refers to the 2009 cycle of the Statistics Canada General Social Survey (Perreault, 2009), which was included.

Study	Reason for Exclusion
Jaffer & Brazeau (2012)[226]	*Measure.* This report from the Standing Senate Committee on Human Rights cited prevalence research on cyberbullying that was already included in this review.
Kirmayer et al. (2013)	*Measure.* This review did not cite unique Canadian data.
Kraft (2006)[227]	*Measure.* This review did not cite unique Canadian data.
Law (2009)[228]	*Republication.* Based on the same data as excluded studies by Law 2012a and Law 2012b
Law (2010)[229]	*Republication.* Based on the same data as excluded study by Law 2012a
Law et al. (2012)a[230]	*Not available.* This study of 733 10-18 year olds in BC measured but did not report the prevalence of cyberbullying (victimization and perpetration). Author correspondence not successful (see Law et al. 2012b).
Law et al. (2012)b[231]	*Not available.* This study of 17, 551 grade 8-12 students in BC measured but did not report the prevalence of cyberbullying (victimization and perpetration). The data came from the 2006 and 2008 cycles of the BC Safe Schools and Social Responsibility Survey. Author correspondence not successful (see above)
Lazuras et al. (2012)	*Measure.* This review, which focussed on the role of empathy and moral disengagement in cyberbullying, did not cite unique Canadian data.
Leenaars (2012)[232]	*Not available.* This thesis measured cyberbullying victimization and perpetration in a sample of 342 grade 7 and 8 students. Leenars reported that 11% of students scored one standard deviation above the mean for victimization and perpetration (respectively) on the cyberbullying instrument. I contacted the author to request the prevalence value as a dichotomized proportion. Email to Lindsey Leenars sent June 13, 2014, who responded on June 16th saying she would look for the data, but the correspondence did not continue further.
Lennox-Shapiro (2005)[233]	*Measure.* This study of 125 grade 8-10 students in Montreal measured offline bullying, but not cyberbullying.
Li (2005)[234]	*Republication.* Based on the same data as included study by Li (2006)
Li (2005)b[235]	*Republication.* Based on the same data as included study by Beran & Li (2007)
Li (2007)a[39]	*Republication.* Based on the same data as included study by Li (2006)
Li (2007)b[40]	*Republication.* Based on the same data as included study by Li (2006)
Li (2008)[236]	*Republication.* Based on the same data as included study by Li (2006)
Li (2010)[237]	*Not available.* This study of 269 grade 7-12 students from 5 schools in Western Canada analyzed students' attitudes and coping strategies related to cyberbullying. Prevalence rates were not reported; however, the survey instrument included unreported items measuring victimization and perpetration. Email to Qing Li sent June 13, 2014; no response obtained

Study	Reason for Exclusion
Mason (2008)[238]	*Measure.* This review for educators did not cite unique Canadian data.
Microsoft Canada surveys from 2004 & 2009[125] *2 studies*	*Not available.* Various online media articles yielded by the Google search mention 2004 and 2009 surveys of Canadian youth commissioned by Microsoft Canada, which reported prevalence rates of online victimization of 25% in 2004 and 40% in 2009. The press release does not contain sufficient detail to contextualize the rates. Since I could not find full reports, I contacted the Microsoft Canada division responsible for the research. Youthography has since been dissolved. Email to Microsoft Corporate Citizenship sent June 9, 2014; no response obtained. Email to StatsCanada Library sent July 31; response indicated that the dead links to the full report were irretrievable.
Mishna (2012)[239]	*Republication.* Based on the same data as included study by Mishna et al. (2010)
Mishna et al. (2008)[148]	*Republication.* Based on the same data as included study by Mishna et al. (2010)
Mishna et al. (2009)[240]	*Measure.* This qualitative study explored youth's perceptions of cyberbullying across 7 small focus groups, but did not measure prevalence.
Nordahl (2013)[241]	*Republication.* Based on the same data as included study by Wade & Beran (2011)
Pierzchala & Beck (2012)[242]	*Measure.* Cyberbullying prevalence was reported in issue 5 of *The Iposos Inter@ctive Reid Report, which may be purchased for* $10 000. A press release mentioned measures of witnessing cyberbullying (i.e., not self-reported experiences), and self-reported negative online experiences for teens with social media profiles (too restricted).
Polihronis (2012)[243]	*Republication.* Based on the same data as included study by Pandori (2013)
Rinaldi (No Date)[244]	*Republication.* Based on the same data as excluded study by Leenars (2012), for which data was unavailable. Emailed Christina Rinaldi on February 26th 2015; no response was obtained.
Runions et al. (2013)[245]	*Measure.* This paper was a theoretical, non-empirical discussion of how information and communication technology might influence social information processing relevant to cyberbullying victimization and perpetration.
Ryan (2011)[246]	*Sample.* This study was restricted to girls who identified as cyber-victims; the sample was too restricted.
Ryan (2013)[247]	*Measure.* This review paper about cyberbullying did not present primary data, and did not cite unique Canadian prevalence rates.
Shapka & Law (2013)[248]	*Not available.* This study of 518 12-18 (grade 7-12) year olds in BC measured but did not report the prevalence of cyberbullying (victimization and perpetration). Email to Jennifer Shapka sent June 2, 2014. Forwarded request to Danielle Law on June 4, 2014. Danielle Law responded that she would look for the data, but the correspondence did not continue further.
Sokal (2012)[249]	*Measure.* This theoretical paper about how to address cyberbullying in girls did not cite unique Canadian data.

Study	Reason for Exclusion
Sugarman & Willoughby (2013)[250]	*Measure.* This review article did not cite unique Canadian data.
Shumka (2012)[251]	*Not available.* This thesis conducted analyses on two Canadian datasets that measured cyberbullying prevalence, the McMaster Teen Study and the School Climate Study, however prevalence values were not reported. I contacted the owners of the datasets for this information. Email to Tracy Vaillancourt sent June 3, 2014 for McMaster Teen Study data. Responded June 17th saying she would get someone to look into it, but the correspondence did not continue. Email to David Smith sent June 3, 2014 for School Climate Study data. Responded June 4 that he would look into it, but the correspondence did not continue.
Tokunaga (2010)[37]	*Measure.* This review article did not cite unique Canadian data.
Vandekamp (2013)[252]	*Republication.* This dissertation reports the prevalence of bullying in a subsample of 151 students with intellectual disabilities and their matched controls from the 2006 cycle of the BC Safe Schools and Social Responsibility Survey. The prevalence of cyberbullying victimization and perpetration was measured by the instrument, but not reported in the thesis. I contacted the owner of the original dataset to request the prevalence rates for the total sample. The study was based on the same dataset as Law 2012b, but this was another opportunity to request the data. Email to Terry Waterhouse sent June 16, 2014. Responded June 17th forwarding the request to Shelley Hymel. No response was obtained.
Wright et al. (2009)[253]	*Sample.* This study of 450 grade 7-8 students from a state in the southeastern region of the USA did not include Canadian subjects.

APPENDIX G: INCLUDED STUDIES

Table 6. Included studies measuring electronic bullying with ≤ 3-month reference periods

Studies are presented in order of ascending reference period and grade/age.

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Ruggier (2013)[114] Data collected in 2012 *Measure based on Safe School Survey*[117]	217 4th grade students aged 8 to 10 (50% female) from 10 classes in a large independent school district in BC	38% school response rate 76% student response rate Included prevalence rate is the pre-test score for students before assignment to an intervention program (or waitlist)	**Definition:** Measured 'cyberbullying' defined with intent, repetition, and power (3/3) **Sources:** Computer, website, e-mail, text message, picture (5) **Behaviours**: Threaten, hurt, make you look bad, spread rumours (4) **Restriction:** Yes	1 month *Current school year assessed in October*	10%	-
Steckley (2010)[85] Data collected in 2010	1,105 grade 4 to 7 students (51% female) from 10 elementary schools in the Waterloo Catholic District School Board (ON)	74% response rate; passive consent Purposive sample selected to reflect the geographic, socioeconomic, and ethno-racial diversity of the student population in the board (p. 21). An anti-bullying program had been implemented for 3 years.	Used CPHA Safe Schools Survey for grades 4-7 (see Totten et al., 2004)	1 month *Data collected in January to February*	12%	6%

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Wong (2009)[119] Data collected in 2009	319 students in grades 6 and 7 (60% female) from 4 middle schools in Toronto	52% school response rate 23% student response rate	Used CPHA Safe Schools Survey for grades 4-7 (see Totten et al., 2004)	1 month *Data collected in February*	10%	7%* *Wong, Personal communication, 2014
Totten et al. (2004) *Canadian Public Health Association Safe School Study* Data collected in fall 2003	1795 grade 4 and 6 to 12 students (original sample was 50% female) from 7 urban or rural sites (MB, QC, BC, NB, ON) 3 sites ran an anti-bullying program for at least 1 year, 3 were developing a program, and 1 had none	82% student response rate; active or passive consent depending on school board Demographically representative of each respective school sample (p. 23) and of the ethno-racial and sexual orientation status of Canadian youth (p. 24) Middle-school students over-represented: 51% in grades 7 to 8	**Definition:** Measured 'electronic bullying' defined with intent & repetition (2/3; power differential intonated with 'unfair') **Sources:** Computer, internet, e-mail, phone, & cell phone text messages (5) **Behaviours:** <u>Grade 4 to 7</u>: Hurt feelings, make someone look bad, threaten (3) <u>Grade 8 to 12</u>: Threaten, hurt feelings, single out, embarrass, make someone look bad, spread rumours, reveal secrets (7) **Restriction:** No	1 month	9%	8%

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Stanton (2011)[91] (Pilot)	377 Canadian students aged 10 to 17 (mean = 14, SD = 1.8) in grades 5 to 12 who accessed the Kid's Help Phone website	Unknown response rate. Online convenience sample. Participants were 81% rural Age groups unequally represented: 10% aged 10 to 11, 33% aged 12 to 13, 36% aged 14 to 15, 21% aged 16 to 17, (71% in grades to 10)	**Definition:** Measured bullying with intent and power (2/3). **Sources:** Online, Facebook, MSN, email, text message (5) **Behaviours:** Being mean or name-calling (2) **Restriction:** Yes	1 month	32% ***Note*** *Data truncated (at least 2 to 3 times)*	12%
Stanton (2011)[91] (National)	998 students (49% female) aged 10 to 17 year (grades 5 to 12) from the Canadian provinces	96% response rate[220] Sample drawn by a research company from a representative household panel of families (p. 39) based on census data[220] (active consent) 73% urban Age groups equivalently represented: 23% aged 10 to 11, 25% aged 12 to 13, 25% aged 14 to 15, 26% aged 16 to 17	See Stanton (2011) (Pilot)	1 month	4% ***Note*** *Data truncated (at least 2 to 3 times)*	2%

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Gardinetti (2010)[98] Data collected in 2009 Thesis in French	49 grade 4 to 6 students (53% female) from one francophone school in BC	Survey part of a larger study with a 51% response rate (p. 46)	**Definition:** Measured 'intimidation cybernétique' or 'messages textuels qui ne sont pas gentils' with no definition (0/3) **Note that the item for text messages taps aggression only* **Sources: a)** text messages **b)** internet, e-mail, MSN, Facebook, MySpace (5) **Behaviours:** None specified (0) **Restriction:** Yes	2 months	**a)** 10% **b)** 8%	**a)** 6% **b)** 4%
Murphy (2009) Study 2	220 grade 7to 10 students (60% female) from 4 schools in southern Ontario	Response rates not reported; active consent procedure 19% of surveys excluded due to incomplete data Grades unequally represented: Grade 7: 4% Grade 8: 10% Grade 9: 50% Grade 10: 37%	Used the WHO measure; see Cappadocia (2008)	2 months	26%	-

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Murphy (2009)[92] **Study 1**	80 grade 9 to 10 students (59% female) from one Canadian high school (probably near Kingston, ON)	Response rate not reported. Active consent procedure (p. 14) Students were tested longitudinally 6 months apart (33% attrition)	Used the WHO measure; see Cappadocia (2008) Prevalence values are for time 1	2 months	31%	28%
Cappadocia (2008)[34] **(2006 data)** World Health Organization's *Health Behaviour in School-Aged Children* Study	1972 'cross-national' Canadian respondents (55% female) in grades 9 to 11	Response rate not reported (active consent required) Clustered sampling design, with class or school as the initial sampling unit. Samples stratified by school size, location, language, and religion within each province (p.10). Only 14 students in grade 11 (combined with grade 10)	**Definition:** Measured 'bullying' defined with intent, repetition, and power (3/3)[254] **Sources:** Computer or e-mail messages or pictures & mobile phone (5) **Behaviours**: Being mean and hurtful (2)[128] **Restriction:** Yes	2 months *Specified as "the past couple of months"*[128]	7%	7%
Cappadocia (2008)[34] **(2007 data)**	Same sample as above; students now in grades 10 to 12	See above	See above	2 months	8%	7%
Vaillancourt et al. (2010)[87]	16,799 grade 4 to 12 (aged 8 to 19)[243]	98% response rate Passive consent procedure	**Definition:** Measured 'cyberbullying' defined with repetition & power	3 months	12%	10%

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Data collected in 2005	students (49% female) from 112 public schools in Southern Ontario		(2/3 components); intent not specified **Sources:** Computer or e-mail messages or pictures (4) **Behaviours:** Hurt feelings, threaten (2) **Restriction:** Yes			
Mishna et al. (2010)[73] **(Bullying)** Results previously released in 2008[148]	2,186 students (55% female) from grades 6, 7, 10, and 11 from a public and a Jewish school board in Toronto	11% school response rate 17%- 35% student response rate; active consent procedure. Stratified, clustered random sampling design with school as sampling unit. Sample stratified by geographical region and Board of Education. Replacement schools drawn in case of denial. 56% from English-speaking homes	**Definition:** Measured 'cyber bullying' defined with negative actions only (0/3) **Source:** E-mail, cell phones, text messages, websites (4) **Behaviour:** Being mean, making fun, scaring (3) **Restriction:** No	3 months	12%	9%
Lines (2007)[86] **(3 months)**	2,474 respondents (76% female)	Online convenience sample; self-selected participation with active consent	**Definition:** Measured 'online bullying' defined as	3 months	38%	-

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Kids Help Phone research study Data collected Dec. 2006 to Jan 2007	from across Canada who visited the Kid's Help Phone website, 54% of whom were aged 13 to 15. 8% of surveys were submitted in French.	Response rate unknown Full age range not reported	negative behaviours only (0/3) **Sources:** Online, computer, cell phone, email, text message, chat room, photo (7) **Behaviours:** Call names, threaten, spread rumours, sent around pictures or words that made you uncomfortable, send mean and hurtful message (5) **Restriction:** Yes *Used a preliminary version of the cyberbullying survey developed by Mishna et al. (2010)*			

Table 7. Included studies measuring electronic aggression with ≤ 3-month reference periods

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Blais (2008)[32] Data collected in 2005	534 grade 9 to 12 students aged 13 to 18 (48% female) from one high school in Southern Ontario	School-based convenience sample. All high-school students invited to participate; response rate not reported. Active consent procedure (p. 113) Only those students who participated at two time points (longitudinal study) were included: 18% attrition	**Definition:** Measured negative behaviours only (p. 138) (0/3) **Sources:** Online, e-mail, text messages (3) **Behaviours:** Being mean (1) **Restriction:** Yes	1 month *Current school term (p. 79) assessed in October (p. 113)*	33%	25%
Mishna et al. (2010)[73] **(Aggression)** Results previously released in 2008[148]	**Same sample as Mishna et al. (2010) (Bullying)** 2,186 students (55% female) from grades 6, 7, 10, and 11 (age 10 to 15) from a public and a Jewish school board in Toronto	**Same sample as Mishna et al. (2010) (Bullying)** 11% school response rate 17% to 35% student response rate; active consent procedure. Stratified, clustered random sampling design with school as	**Definition:** Measured negative experiences only (0/3) **Source:** Not specified (0) **Behaviours:** Name calling, threats, spreading rumours, sending	3 months	50% (At least 1 of 7 types of online aggression)	34% (At least 1 of 6 types of online aggression)

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
		sampling unit. Sample stratified by geographical region and Board of Education. Replacement schools drawn in case of denial. 56% from English-speaking homes	private pictures without consent, impersonation, sending/receiving unwanted sexual messages, and (only for victimization) being asked to do something sexual (6 to 7) **Restriction:** Yes			
Wade & Beran (2011)[74] Data collected in 2007/8[241]	529 students (53% female) in grades 6, 7, 10 and 11 (age 10 to 15) from one city in Alberta	School-based convenience sample with 19% school response rate and 20% student response rate. 73% from English-speaking homes (p.47) Only 10 students in grade 10 (p. 50)	See Mishna et al. (2010) (above) *Prevalence values are the proportion of students who endorsed at least 1 of 6 or 7 examples of cyberbullying*	3 months	22% (At least 1 of 7 types online aggression	30% (At least 1 of 6 types of online aggression)

Table 8. Included studies measuring electronic bullying with ≤ 12-month reference periods

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Laprise et al. (2011)[106] Data collected in 2010 to 2011 *L' Enquête Québécoise Sur La Santé Des Jeunes du Secondaire* *Report in French*	63,196 secondary school students (49% female) from 470 schools across Quebec, 79% aged between 13 and 19 (grade 7 to 12).	97% school response rate 88% student response rate Schools selected with proportionate-to-size sampling. Classes selected at each region/grade level. Aboriginal schools and those with more than 30% disabled students (p. 25)	**Definition:** Measured 'cyberintimidation' with intent (1/3) **Source:** Computer, cell phone, image, photo, video (5) **Behaviours:** Harm, comment (2) **Restriction:** No	2 to 8 months *Current school year (since September) assessed from November to May*	5%	-
Trach et al. (2010)[83] *Grade 4 to 7 sample only* *BC Safe Schools and Social Responsibility Survey* Data collected in 2008	4,523 grade 4 to 7 students (49% female) from a large suburban school district in British Columbia *Grade 8 to 12 students from this sample are reported by Buchanan, 2012*	80% response rate for larger sample. Administered by school board (passive consent) Alternative schools excluded	**Definition:** Measured 'cyberbullying' with intent, repetition, and power (3/3) **Sources and behaviours:** Examples given but not described (unknown) **Restriction:** No	4 to 8 months *Current school year assessed in the winter*[255] *or spring* (Trach, personal communication, 6 November 2012).	16% *(J. Trach, Personal Communication, 26 June 2014)*	7% *(J. Trach, Personal Communication, 26 June 2014)*

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Cassidy et al. (2009)[94] Data collected in 2007	365 grade 6 to 9 students aged 11 to 15 (59% female) from 5 schools in urban British Columbia	Response rate not reported Purposive sampling. 69% Asian; ethnic breakdown roughly representative of district (p. 386) Grade 8 to 9 students over-represented: 12% grade 6 20% grade 7 68% grade 8/9	**Definition:** Measured cyberbullying with no definition (0/3) **Sources:** *Victimization:* None specified (0) *Perpetration*: chat room, e-mail, text messaging, online discussion (4) [94, p. 390] **Behaviours:** *Victimization*: None specified (0) *Perpetration*: Harass (1) **Restriction:** Yes	5 to 7 months *Past school year assessed in February- April (Wanda Cassidy, Personal Communication, 16 June 2014)*	18% *Victimization measure limited to 'student(s) who attend your school*	26%
Buchanan (2012)[84] *BC Safe Schools and Social Responsibility Survey* Data collected in 2008	42,818 grade 8 to 12 students (51% female) in a large urban school district in British Columbia	80% response rate Administered by school board (passive consent) Excluded subjects from alternative schools and those with key data (e.g.,	**Definition:** Measured 'cyberbullying' with intent, repetition, and power (3/3) **Sources:** Computer or text messages (2)	4 to 8 months *Current school year assessed in the winter*[255] *or spring* (Trach, personal communication, 6 November 2012).	23%	25%

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
		gender) missing	**Behaviours:** Exclude, threaten, humiliate (3) **Restriction:** Yes			
Spears et al. (2005)[96] Data collected in 2005 *Young Canadians in a Wired World Phase II Study (Media Awareness Network)*	5,272 grade 4 to 11 students from the Canadian provinces and territories	95% response rate in targeted schools. Participants from the phase 1 study (84% response rate) were sampled. The original sample was stratified by community size and region[256]	**Definition:** Measured 'bullying' with no definition (0/3) **Sources:** Internet, phone, & cell phone (separate items; 1 source each) **Behaviours:** Not specified (0) **Restriction:** Yes	6 to 7 months *Current school year assessed in February and March*	9% internet 4% phone 2% cell phone	-
Stys (2004)[93] **(SSS)** Data collected in 2004 *Used a modification of the Safe Schools*	233 grade 9 to 12 students (64% female) from 3 schools in rural eastern Ontario Sample ethnically	Convenience sample with 23% response rate; active consent Grade 11 and 12 students sampled in one school only. Grade 9 students	**Definition:** Measured 'electronic bullying' defined with intent, repetition, & power (3/3) **Sources:** Computer, email,	8 to 9 months *Current school year assessed in May to June*	16%	13%

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Survey[117]	representative for rural Ontario (p. 29)	over-represented: 59% in grade 9, 31% in grade 10, 5% in grade 11, and 5% in grade 12	pictures (3) **Behaviours:** Threaten, hurt feelings, single out, embarrass, make someone look bad, spread rumours, reveal secrets (7) **Restriction:** Yes			
Stys (2004)[93] **(EBQ)** Data collected in 2004 *Electronic Bullying Questionnaire*	See above	See above	**Definition:** Measured 'electronic bullying' defined with intent, repetition, & power (3/3) **Sources:** E-mail, chatroom, instant messaging, web pages, blogs, and cell-phone text messaging (6) **Behaviours:** Hurt feelings (1) **Restriction:** Yes	8 to 9 months *Current school year assessed in May-June*	39% *Bullied through at least 1 of 6 sources*	34% *Bullied through at least 1 of 6 sources*
CPCO (2006)[102]	92 grade 4 to 7	Internal data	**Definition:**	Past school year	13%	2%

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Catholic Principals' Council Secondary Safe Schools Survey	students (48% female) in one Catholic school in Etiobicoke, ON.	collection by school board; presumably passive consent but sampling not reported. Response rate not reported.	Measured internet bullying defined as negative actions only (0/3)[121] **Sources:** Internet, MSN, text messaging, camera phone, website, blogging (6) **Behaviours:** Not specified (0) **Restriction:** Yes	*Date of survey administration not reported*		
Bonanno & Hymel (2013)[99] *Used the Safe Schools Survey*[117]	399 grade 8 to 10 students (57% female) from an urban inner city high school in southern BC, mean age = 14.2	76% response rate, active consent 62% Asian, 22% Caucasian	**Definition:** Measured 'electronic bullying' with intent, repetition, & power (3/3) **Sources:** Computer or e-mail or cell phone messages or pictures (5) **Behaviours:** Threaten, hurt feelings, single out, embarrass, make	Past school year *Date of survey administration not reported*	11%	11%

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
			someone look bad, spread rumours, reveal secrets (7) **Restriction:** Yes			
Smith et al. (2009)[115] *McCreary Centre BC Adolescent Health Survey* Data collected in 2008	29,440 grade 7 to 12 students from 50 school boards across British Columbia	Response rate not reported. Passive or active consent (depending on school district) (p. 9) Classes randomly selected (p. 8); data population-weighted by Statistics Canada (p. 9)	**Definition:** Measured whether students had been 'bullied or picked on' with no definition (0/3) **Source:** Internet (1) **Behaviours:** Picking on (1) **Restriction:** Yes	12 months	17%	-
Paglia-Boak et al. (2012)[110] *Ontario Student Drug Use and Health Survey* Data collected in 2010/11	9,288 grade 7 to 12 students from 40 school boards across Ontario, 48% female after weighting (54% female before weighting)	71% school response rate; 62% student response rate Active consent process (p. 23) Stratified two-stage sampling design with proportionate-to-size systematic sampling without replacement. Classes	**Definition:** Measured whether students were 'bullied or picked on'. Bullying was defined with intent, repetition, and power (3/3). **Source:** Internet (1) **Behaviours:** None	12 months	22%	-

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
		randomly selected within each school. Oversampling in 5 public health regions (p. 23).	specified (0) **Restriction:** Yes			
Gauthier et al. (2013)[90] **(2010 data)** *Catholic Principals' Council Secondary Safe Schools Survey* Data collected in 2010	3,831 grade 9 to 12 students in the Toronto Catholic District School Board	Response rate not reported; 58% based on an estimated total number of surveys of 6600 (33 schools x 200 students/school). Stratified sample selected to be representative of the school board, equally divided between grades 9 to 12 (p. 2)	**Definition:** Measured 'cyberbullying' with no definition (0/3) **Source:** Internet (1) **Behaviours:** None specified (0) **Restriction:** Yes	Past year *Date of administration unknown*	4%	-
Gauthier et al. (2013)[90] **(2011 data)** Data collected in 2011	5,429 grade 9 to 12 students in the Toronto Catholic District School Board	See above. Estimated response rate = 82%	See above	Past year *Date of administration unknown*	6%	-
Gauthier et al. (2013)[90] **(2012 data)** Data collected in	5,668 grade 9 to 12 students (53% female) in the Toronto Catholic District	See above. Estimated response rate = 86% 24% in grade 9, 22%	See above	Past year *Date of administration unknown*	6%	-

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
2012	School Board	in grade 10, 23% in grade 11, and 29% in grade 12				
Boucher et al. 2013[100] Article in French	262 (66% female) heterosexual and LGBT youth aged 14 to 22 (mean = 17.9, SD = 2.0) in Quebec	Sample recruited via Facebook (targeted ads), community youth organizations, and through student unions and LGBT societies in universities and colleges across Quebec (p. 4). No response rate 14.5% heterosexual, 85.5% homosexual, bisexual, transsexual or questioning (p. 7)	**Definition:** Measured 'cyberintimidation' with no definition **Sources:** Not specified (0) **Behaviours:** Rumours, intimidation, threats (3) **Restriction:** No	Past 12 months (M. Blais, personal communication, June 5, 2014)	23% *By sexuality or gender identity:* *28% hetero* *19% homo* *26% bi* *22% cis* *33% trans*	-

Table 9. Included studies measuring electronic aggression with ≤ 12-month reference periods

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Pettalia (2013)[112] Data collected in 2009[197]	260 grade 7 to 8 students (59% female) aged 12-15 (mean= 13, SD= 0.67) from 12 English or French schools in Northeastern Ontario	44% school response rate; student response rate not reported. Active consent procedure required parent and student consent (p. 2760)	**Definition:** Measured online aggression with 6 scenarios; emphasized intent (1/3) **Sources:** Internet, SMS, message, picture, video (5) **Behaviours:** Impersonation, denigration, outing/trickery, exclusion, harassment, stalking (6) **Restriction:** Yes	4 to 8 months *Current school year assessed from January to April*[197]	61% *Victims of at least 1 of 6 experiences*	49% *Perpetrated at least 1 of 6 behaviours*
Jackson et al., (2009)[95] Data collected in 2007	**Same sample as Cassidy et al. (2009)**[94] 365 grade 6 to 9 students aged 11 to 15 (59% female) from 5 schools in urban BC. 68% in grade 8 and 9.	**Same sample as Cassidy et al. (2009)** [94] Response rate not reported. Purposive sampling. 69% Asian; ethnic breakdown roughly representative of district (p. 386)	**Definition:** Measured negative actions only (0/3) **Sources:** Internet, email (2) **Behaviours:** Being angry, rude, vulgar (3) **Restriction:** Yes	5 to 7 months	39%	

Study/Year	Sample	Representativeness	Measurement	Period	Victims	Perpetrators
Pandori (2013)[111] *Safe Schools Research Initiative* Data collected in 2011	16,145 grade 9 to 12 or extra year students aged 14 to 18+) (50% female) in South-Western Ontario	Response rate not reported. Surveys administered by a large school board; active consent procedure (p. 64). Participants randomly selected through convenience sampling as class cohorts; teachers determined class participation.	**Definition:** Measured negative behaviours (0/3) **Sources:** E-mail, instant message, text message, comments, pictures, video (6) **Behaviours:** Forward private material, spread rumours, threaten/aggress, post inappropriate material without permission (4) **Restriction:** Yes	6 to 7 months *Current school year assessed in March and April*	34% (At least 1 of 4 types of online aggression)	21% (At least 1 of 4 types of online aggression)

Table 10. Included studies measuring electronic bullying with lifetime reference periods

Study/Year	Sample	Representativeness	Measurement	Victims	Perpetrators
Li (2006)[38] Data collected in 2004[39]	264 grade 7 to 9 students (51% female) from 3 middle schools in Alberta	Response rates not reported Students 'randomly selected' (p. 162) but appears to be a school-based convenience sample.	**Definition:** Measured 'cyberbullying' with no definition (0/3) **Sources:** Email, chat room, cell phone (3) **Behaviours:** None specified (0) **Restriction:** No	25%	17% (*15% in Li 2007b*[40]*)*
Beran & Li (2007)[47] Results previously published in 2005[123]	432 grade 7 to 9 students aged 12 to 15 (55% female) from 9 middle schools in Calgary, Alberta	Response rate not reported; the sample was 'randomly selected' but appears to be a school-based convenience sample with active consent. Low response rate: "few students returned consent forms" (p. 25)	**Definition:** Measured 'harassment using technology', defined with intent, repetition, & power (3/3) **Sources:** Internet, computer, cell phone, answering machine, video camera (5) **Behaviours:** Saying mean or hurtful things, make fun of, call names, ignore, exclude, spread rumours, send mean note, try to make other students dislike the person (8) **Restriction:** No	58%	26%
Cochrane (2008)[101]	396 Grade 7 to 9 students aged 11 to 17 (59%	Active consent; 47% student response rate	**Definition:** Measured 'cyberbullying' defined with intent & repetition (2/3)	50%	35%

Study/Year	Sample	Representativeness	Measurement	Victims	Perpetrators
	female) from 10 urban or rural schools in one school district in Saskatchewan	The researcher approached a public school division for approval to invite principals to participate; 3 agreed 18% aboriginal 27% in grade 7 24% grade 8 49% grade 9	**Sources:** E-mail, cell phone text messages, pager messages, instant messaging, personal websites, social networking sites, Facebook, MySpace, personal websites, online gaming, pictures, webcam (12) **Behaviours:** Hurt feelings, control, use mean words, threaten, call names, saying mean things behind someone's back, deliberately exclude, making faces, dirty gestures, exclusion (10, excluding examples of physical bullying requiring contact) **Restriction:** No		
Halliday (2012)[104] Data collected in 2011	3,052 Nova Scotia student respondents to an online public survey, 49% female	Online convenience sample 22% grades P to 6 61% grades 7 to 9 9% grades 10 to 12 2% post- secondary	**Definition:** Measured 'cyberbullying' defined with intent and power (2/3) **Sources:** Email, text messages, pictures, social media (4) **Behaviours:** None specified (0) **Restriction:** Yes	23%	10%
Patchin & Hinduja (2006)[105]	The reported sample of 384 international	Participants were recruited from the website of a female	**Definition:** Measured "online bullying" defined as negative actions only (0/3)	26%	20%

Study/Year	Sample	Representativeness	Measurement	Victims	Perpetrators
Data collected in 2004	Anglophone respondents in grades 2 to 12 (aged 9 to 17; mean = 14.1), of whom 85% were female, included 46 Canadian respondents.	music star and were entered in a draw for one of three signed photographs of the musician. Grade 9-12 students over-represented: Grades 2 to 5: 6% Grades 6 to 8: 39% Grades 9 to 12: 51%	**Sources:** Online (1) **Behaviours**: Bothering someone, teasing in a mean way, name calling, exclusion, threatening, saying unwanted sexually-related things (6) **Restriction:** No		
Stadey (2012)[116] Data collected in 2011	828 students in 35 classes selected from urban, rural, English and French elementary, middle, and secondary schools	No response rate Purposive sample selected to be representative of public schools in Nova Scotia (p. 3). Students participated in focus groups in which they discussed the definition of bullying, whether they had experienced it, etc.	**Definition:** Discussed in a focus group setting but not specified (unknown) **Sources:** Discussed but not specified (unknown) **Behaviours:** Discussed but not specified (unknown) **Restriction:** No ***Notes*** *Polling was preceded by a group discussion of what students thought 'cyberbullying' meant.*	39% (A further 8% were unsure)	19% (A further 9% were unsure)
Lines (2007)[86] **(Lifetime)**	**Same sample as Lines (2007)**[86]	**Same sample as Lines (2007)**[86]	**Definition:** Measured 'online bullying' defined as negative	70%	44%

Study/Year	Sample	Representativeness	Measurement	Victims	Perpetrators
	(3 months) 2,474 respondents (76% female) from across Canada who visited the Kid's Help Phone website, 54% of whom were aged 13 to 15. 8% of surveys were submitted in French.	**(3 months)** Online convenience sample; self-selected participation with active consent Response rate unknown Full age range not reported	behaviours only (0/3) **Sources:** Online, computer, cell phone, email, text message, chat room, photo (7) **Behaviours:** Call names, threaten, spread rumours, sent around pictures or words that made you uncomfortable, send mean and hurtful message (5) **Restriction:** Yes *Used a preliminary version of the cyberbullying survey developed by Mishna et al. (2010)*		
Knighton et al. (2012)[21] *Kids Help Phone research study* Data collected in 2011	460 Canadian visitors to the Kids Help Phone website (74% female), 54% aged 13 to 15. Age range not reported	Convenience sample of visitors to counseling website. Response rate not reported.	**Definition:** Measured 'cyberbullying' defined as negative actions only (0/3) **Sources:** Internet, e-mail, text messages, instant messaging (5) **Behaviours:** Harass, humiliate, threaten (3) **Restriction:** Yes	65%	
Hinduja & Patchin (2008)[105]	The reported sample of 1,378	Participants were recruited from 7	**Definition:** Measured "online bullying" defined as negative	38% (J. Patchin,	14% (J. Patchin,

Study/Year	Sample	Representativeness	Measurement	Victims	Perpetrators
Data collected in Dec 2004 to Jan 2005	international Anglophone respondents aged up to 17 (mean = 14.8) included 365 Canadian respondents	entertainment websites. A number of females were randomly selected to balance the original 82% female sample.	actions only (0/3) **Sources:** Online (1) **Behaviours**: Bothering someone, teasing in a mean way, name calling, exclusion, threatening, saying unwanted sexually-related things (6) **Restriction:** No	Personal Communication, July 7, 2014)	Personal Communication, July 7, 2014)
McLean (2007)[108] Data collected in 2007	448 grade 9 to 12 students (44.8% female) from 6 high schools in Northeastern Ontario	91% student response rate in participating schools. Active consent with parental consent for participants under 16. Principals selected one academic and one applied level class to participate in each grade level (convenience sample). 61% of students were in grades 11 or 12 (timetabling issue)	**Definition:** Measured 'cyberbullying' with no definition (0/3) **Sources:** Text message, chat room, e-mail, website (4) **Behaviours:** Threaten (1) **Restriction:** No	27% *Denominator = 431* Frequency item *57% cyberbullied since September (7 months; denominator = 110)* *Data collected in April*	28% *Denominator = 443* Frequency item *21% cyberbullied someone else since September (7 months; denominator = 434)* *Data collected in April*
Yau et al. (2012)[20]	71, 671 grade 9 to 12 students (48% female) in	Census of students in the Toronto District School Board with	**Definition:** Measured 'cyberbullying' with no definition (0/3). Restricted to 'in school'.	9%	

Study/Year	Sample	Representativeness	Measurement	Victims	Perpetrators
Toronto District School Board Student Census Data collected in 2011	the Toronto District School Board[257]	84% response rate[257] and passive consent	**Sources:** Internet, cell phone, email, text messages, Facebook (5) **Behaviours:** Not specified (0) **Restriction:** Yes		
Magaud et al. (2013)[107] *Data collected before 2013*	50 youth (50% female, mean age = 16.7 years, SD = 3.3) at considered at risk for psychosis; authors located in Calgary, Alberta	Purposive sample of youth who met the criteria for prodromal symptoms of psychosis (p. 2). Parental consent was required for minors.	**Definition:** Measured "harassed or bullied through technology or communication devices" with no definition (0/3) **Sources:** Chat, texts, cell, Facebook, blog, website, other web, technology, communication devices (9) **Behaviours:** Harass (1) **Restriction:** No	38%	
Perreault (2011)[76] *Statistics Canada General Social Survey* Data collected in 2009 *Data accessed*	822 non-institutionalized respondents aged 15 to 19 enrolled in secondary education full-time and living in a household with a land line phone in the 10	62% response rate Households selected by random digit dialing. Data weighted to reflect non-institutionalized population aged ≥15 (p. 18)	**Definition:** Measured 'cyberbullying' with only intimidation (power) clearly specified (1/3) **Source:** Internet, e-mail, instant message, websites (4) **Behaviours:** Threatening, aggressing, making hateful comments, impersonation (4)	19% (weighted) 18% (unweighted)	

Study/Year	Sample	Representativeness	Measurement	Victims	Perpetrators
through the Data Liberation Initiative at Dalhousie	Canadian provinces.		**Restriction:** No		
Pisch (2010)[113]	476 grade 10 to 12 students aged 16 to 21 (53% female) from 3 schools (2 public, 1 Catholic) in a Saskatchewan city. Grade 10 under-represented (4%) because participants had to be at least age 16.	95% response rate among eligible students; eligibility included being present at school and in the classroom on the day of administration. Researcher invited principals of 3 schools to participate	**Definition:** Measured 'cyberbullying' defined with intent & repetition (2/3) **Sources:** E-mail, instant messaging, text messages, message boards, social networking sites, Facebook, Twitter, chatroom, cellphone (9) **Behaviours:** Hurtful comments, threats, gestures, faces (4; excluding examples of physical bullying) **Restriction:** No	44%	31%

Table 11. Included studies measuring electronic aggression with lifetime reference periods

Study/Year	Sample	Representativeness	Measurement	Victims	Perpetrators
Microsoft (2012)[109] *Microsoft Trustworthy Computing Survey* Data collected in 2012	~300 Canadian youth aged 8 to 17 (50% female)	Response rate not reported Data collected by professional research company advertising representative and reliable panel data[126]	**Definition:** Measured negative online experiences (0/3) **Sources:** Internet (1) **Behaviours:** Being mean, being unfriendly, making fun, teasing, name-calling (5) **Restriction:** Yes	40%	20%
Steeves (2014)[88] *Young Canadians in a Wired World Phase III Study* Data collected in 2013	5,436 grade 4 to11 students (46% female and 13% gender not provided) from across 10 provinces and 3 territories	Response rate not reported. Active consent procedure. The researchers contacted schools that had participated in the phase II study (Spears et al., 2005) plus additional boards (p.46).	**Definition:** Measured online 'mean and cruel' behaviours and threats with no definition (0/3) **Sources:** Online (0) **Behaviours:** a) Being mean or cruel (2) b) making threats (1) **Restriction:** No	a) 37% b) 31% *Surveys administered from February to June (p. 47)*	a) 23% b) 9%
Van Ingen (2014)[118]	134 grade 7 to 9	School-based	**Definition:** Measured	-	56%

Study/Year	Sample	Representativeness	Measurement	Victims	Perpetrators
	students (53% female) from two public schools in Edmonton, Alberta. Students aged 11 to 15; mean = 13.9	convenience sample with 88% student response rate; active consent 152 students invited to participate; 750 students enrolled (p. 72). Teacher consent solicited.	Definition and items described negative actions only (0/3) **Sources:** Internet, e-mail, cell phone, websites, images, video (6) **Behaviours:** Threaten, insult, create humiliating material, distribute humiliating material, make fun, spread rumours, impersonate, exclude, stalk, send sexual material (10) **Restriction:** Yes		*Responded affirmatively to at least 1 of 16 items* (B. Van Ingen, Personal communication, 4 July 2014)
Gomez-Garibello et al. (2012)[103]	115 students (39% female) aged 12 to 17 (mean = 15, SD= 1.87) from one private high school in Quebec (Gomez-Garibello, Personal communication, 2014)	Response rate not reported	**Definition:** Measured negative actions only (0/3) **Sources:** Not reported **Behaviours**: 16 (Gomez-Garibello, Personal communication, 2014)	65%	11% *Perpetration was possibly measured by a global item with no definition*

APPENDIX H: DATA FOR SECONDARY OUTCOMES

Table 13. Frequency of cyberbullying victimization and perpetration

This table summarizes all available information about the frequency of cyberbullying victimization and perpetration within samples. Rows with grey highlighting indicate that frequency rows will not sum to the overall prevalence rate because they are based on different calculations.

Study	Victimization		Perpetration	
	Overall Prevalence	Frequency Information	Overall Prevalence	Frequency Information
1-to-3-Month Prevalence				
Ruggier[114]	10%	• 7% once or a few times • 0% every month • 1% every week • 0% several times a week • *Values do not sum to 10% (2% short)*	-	-
Wong[119]		-	6%	• 6% once or twice • 0% every week (0.3%)
Totten et al.[117]	9%	• 7% once or twice • 2% weekly	8%	• 6% once or twice • 2% weekly
Stanton[91] (National)	4% *Victimized at least 2 to 3 times*	The mean of the 5-point Likert scale measure for victimization was 1.43, likely representing a point between 'once or twice' and 'two or three times' (coding not described)	2% *Offended at least 2 to 3 times*	The mean of the 5-point Likert scale measure for perpetration was 1.13, likely representing a point between 'once or twice' and 'two or three times' (coding not described)
Mishna et al.[73] (Aggression)	50% *Victimized in at least 1 of 7 ways*	Weighted average of frequency data over all 7 types of victimization: • 85% never • 12% once or twice • 3% two or more times	34% *Offended in at least 1 of 7 ways*	Weighted average of frequency data over all 7 types of perpetration: • 90% never • 8% once or twice • 2% two or more times

Study	Victimization		Perpetration	
	Overall Prevalence	Frequency Information	Overall Prevalence	Frequency Information
Wade & Beran[74]	22% *Victimized in at least 1 of 7 ways*	The mean of the 5-point Likert scale measure for victimization was 0.23, representing a point between 'never' and 'once or twice'	-	-
6-12 Month Prevalence				
Laprise et al.[106]	7%	• 3% once • 3% sometimes • 1% often (0.63%) • 0% very often (0.33%)	-	-
Trach et al.[83] *Grade 4 to 7 only*	16%	• 11% once or a few times • 2% once a month • 2% every week or more *Values do not sum to 16% because of rounding*	7%	• 6.7% once or a few times • <1.0% once a month • <1.0% every week or more
Cassidy et al.[94]	39%	• 35% occasionally • 4% often	26%	• 20% occasionally • 3% 1 to 2 times per week • 1% 3 to 4 times per week • 1% every day • 1% several times per day
Buchanan[84]	23%	The mean of the 4-point Likert scale was 0.23 (SD = 0.31), representing a point between 'never' and 'once or a few times'	25%	The mean of the 4-point Likert scale was 0.30 (SD = 0.42), representing a point between 'never' and 'once or a few times'.
Stys [93] (SSS)	16%	• 13% once or twice • 3% monthly or more	13%	• 8% once or twice • 5% monthly or more

Study	Victimization		Perpetration	
	Overall Prevalence	**Frequency Information**	**Overall Prevalence**	**Frequency Information**
Stys[93] (EBQ)	39% *Victimized through at least 1 of 6 sources*	Weighted average of frequency data for all students over 6 sources of cyber-victimization: • 88% not at all • 10% once or a few times • 2% monthly or more	34% *Perpetrated through at least 1 of 6 sources*	Weighted average of frequency data for all students over 6 sources of cyberbullying: • 89% not at all • 8% once or a few times • 3% monthly or more
CPCO[102]	13%	• 10% Sometimes • 3% Often	2%	-
Pettalia[112]	61%	Weighted average of frequency data for all students over 6 types of cyber-victimization: ○ 71% Never ○ 12% 1 time ○ 7% 2 times ○ 4% 3 times ○ 1% 4 times ○ 6% 5 or more times	49%	Weighted average of frequency data for all students over 6 types of cyberbullying: ○ 79% Never ○ 8% 1 time ○ 5% 2 times ○ 2% 3 times ○ 1% 5 or more times
Pandori[111]	34% *Victimized in at least 1 of 4 ways*	• 25% victimized in 1 of 4 ways • 5% victimized in 2 of 4 ways • 2% victimized in 3 of 4 ways • 2% victimized in 4 of 4 ways	21% *Offended in at least 1 of 4 ways*	• 17% offended in 1 of 4 ways • 1% offended in 2 of 4 ways • 1% offended in 3 of 4 ways • 2% offended in 4 of 4 ways
		Participants selected 'never' as most frequent response for 4 cyber-victimization experiences. Mean frequencies on a 5-pt Likert scale ranged from 1.39 to 1.51, points between 'never' and 'seldom'		Participants selected 'never' as most frequent response for 4 cyberbullying behaviours. Mean frequencies on a 5-pt Likert scale ranged from 1.2 to 1.3, points between 'never' and 'seldom'

Study	Victimization		Perpetration	
	Overall Prevalence	Frequency Information	Overall Prevalence	Frequency Information
Lifetime Prevalence				
Li[38] *These values are from a republication of the data (Li[40]) that used a more detailed frequency breakdown*	25%	• 15% 1 to 3 times • 5% 4 to 10 times • 6% over 10 times *Values do not sum to 25% because of rounding*	15%	• 6% 1 to 3 times • 4% 4 to 10 times • 4% over 10 times *Values do not sum to 15% because of rounding*
Beran & Li[47]	58%	• 34% once or twice • 19% at least a few times • 3% many times • 1% almost every day *Values do not sum to 58% because of rounding*	26%	• 22% once or twice • 1% at least a few times • 1% many times • 1% almost every day *Values do not sum to 26% because of rounding*
Cochrane[101]	50%	• 29% 1 to 3 times • 15% 4 to 10 times • 5% over 10 times *Values do not sum to 50% because of rounding*	35%	• 23% 1 to 3 times • 6% 4 to 10 times • 5% more than 10 times *Values do not sum to 35% because of rounding*
Halliday[104]	23%	• 12% less than once a month • 11% monthly or more	10%	• 5% less than once a month • 5% monthly or more
McLean[108] *Responses to 'Since September, how many times have you been cyberbullied/cyberbullied someone else per month?*	57%	• 32% less than once a month • 12% about once a month • 7% weekly • 6% daily	21%	• 16% 1 to 5 times • 2% 1 to 5 times • 1% 10 to 14 times • 4% 15 or more times *Values do not sum to 21% because of rounding*

Study	Victimization		Perpetration	
	Overall Prevalence	Frequency Information	Overall Prevalence	Frequency Information
Yau et al.[122]	8%	• 5% Sometimes • 3% Often	-	-
Perreault[76] *Data accessed through Data Liberation Initiative*	19%	• 10% in one of four ways • 8% in two of four ways • 1% in three of four ways • 1% in four of four ways *Values do not sum to 19% because of rounding*	-	-
Pisch[113]	44%	• 25% 1 to 3 times • 9% 4 to 10 times • 10% more than 10 times	31%	• 17% 1 to 3 times • 7% 4 to 10 times • 8% over 10 times *Values do not sum to 31% because of rounding*
Steeves[88]	31% *Threats*	• 13% Less than once a year • 8% At least once a year • 5% At least once a month • 2% At least once a week • 2% At least once a day *Values do not sum to 31% because of rounding*	9%	-
Van Ingen[118]	-	-	56%	Frequency histogram (p. 87) shows a non-normal distribution ($W(133) = .338$, $p < .001$) with strong positive skew.

Table 14. Online vs. offline bullying victimization and perpetration

This table summarizes all available information comparing the prevalence of online versus offline bullying (victimization and perpetration) within samples, if they used the same reference period and similar measures.

	Online	General (All types)	Offline			Online	General (All types)	Offline		
			Verbal	Social	Physical			Verbal	Social	Physical
1-3 Month Prevalence										
Ruggier[114]	10%	*34%*[vi]	53%	50%	40%	-	-	-	-	-
Steckley[85]	12%	-	47%	37%	27%	6%	-	24%	20%	13%
Wong[119]	10%	-	53%	35%	28%	-	-	-	-	-
Totten et al.[117]	9%	61%	48%	30%	21%	8%	52%	41%	21%	17%
Stanton[91] (Pilot)	32%	-	40%	35%	16%	11%	-	21%	33%	11%
Stanton[91] (National)	4%	-	9%	6%	3%	2%	-	3%	1%	2%
Gardinetti[98]	8%	58%	-	-	-	4%	33%	-	-	-
Murphy[92] (Study 1)	31%	-	55%	46%	16%	28%	-	43%	30%	16%
Vaillancourt et al[87]	12%	63%	51%	37%	32%	10%	49%	36%	29%	19%
Blais[32]	33%	83%	-	-	-	25%	65%	-	-	-
Up to 12 month prevalence										
Laprise et al[106]	7%	36%	-	-	-	-	-	-	-	-
Buchanan[84]	25%	-	53%	42%	29%	23%	-	51%	40%	34%
Spears et al[96]	9%	25%	-	-	-	-	-	-	-	-
Stys[93] (SSS)	16%	-	75%	60%	30%	13%	-	62%	55%	30%
CPCO[102]	13%	-	64%	40%	36%	2%	-	12%	10%	5%
Bonanno & Hymel[99]	11%	-	48%	42%	-	11%	-	44%	33%	-
Gauthier[90] (2010 data)	4%	45%	17%	7%	7%	-	-	-	-	-
Gauthier[90] (2011 data)	6%	30%	20%	8%	7%	-	-	-	-	-
Gauthier[90] (2012 data)	6%	30%	20%	8%	6%	-	-	-	-	-
Boucher et al. [100]	23%	26%	-	-	-	-	-	-	-	-

[vi] See p.52 for an explanation of why prevalence rates for global items (e.g., 'have you been bullied') can be lower than would be indicated by responses to a number of items addressing more specific forms of bullying.

Lifetime Prevalence										
Li[38]	25%	49%	-	-	-	17%	34%	-	-	-
Cochrane[101]	50%	63%	-	-	-	35%	55%	-	-	-
Halliday (2012)[104]	23%	58%	48%	41%	30%	10%	29%	22%	17%	12%
Yau et al.[122]	8%		31%	18%	9%	-	-	-	-	-
Pisch[113]	44%	53%	-	-	-	31%	50%	-	-	-
Microsoft[109]	40%	84%	-	-	-	20%	36%	-	-	-
Correlation (*r*) with online bullying* **Arcsine transform*	**-**	**0.57**	**0.47**	**0.58**	**0.28**	**-**	**0.53**	**0.65**	**0.59**	**0.64**

Table 15. Prevalence of cyberbullying victimization and perpetration by sex

This table summarizes all information comparing cyberbullying prevalence between females and males. Odds ratios are accompanied by 95% confidence intervals. Values above 1 indicate greater female involvement. Effect sizes (Cohen's *d* and R^2) are provided for statistically significant comparisons.

Study	Victimization	Effect Size	Perpetration	Effect Size
1-to-3-Month Prevalence				
Ruggier[114]	**Males significantly (p < 0.05) more likely to be victimized** Female: 5% Male: 15%	$\hat{p}_F - \hat{p}_M$ = -10.2% χ^2 (1) = 6.49, p = 0.01 OR: 0.28 (0.10 - 0.78) d = -0.70 (medium) R^2 = 11.0% (medium)	-	-
Steckley[85]	No significant difference Female: 12% Male: 11%	$\hat{p}_F - \hat{p}_M$ = 1% χ^2 (1) = 0.26, p = 0.61 OR = 1.1 (0.76 - 1.59)	No significant difference Female: 5% Male: 7%	$\hat{p}_F$-$\hat{p}_M$ = 2% χ^2 (1) = 2.06, p = 0.15 OR = 0.69 (0.42 - 1.14)
Wong[119]	-	-	No significant difference Female: 8% Male: 6% (A. Wong, personal communication, June 21 2014)	$\hat{p}_F - \hat{p}_M$ = 2% χ^2 (1) = 0.27, p = 0.60 OR = 1.28 (0.50 - 3.28)
Totten et al.[117]	No significant difference	-	No significant difference	-
Stanton[91] (National)	No significant difference	F = 0.23, p = 0.63 η^2 = 0.00	**Males significantly (p = 0.01) more likely to perpetrate**. Female: 1% Male: 3%	$\hat{p}_F - \hat{p}_M$ = -2% χ^2 (1) = 4.53, p = 0.03 OR = 0.34 (0.12 - 0.96) d = -0.59 (medium) R^2 = 8.1% (small)

	Mean of 1.45 for females vs. 1.41 for males on a 5-pt scale, likely representing points between 'once or twice' and 'sometimes'		Mean of 1.07 for females and 1.14 for males on a 5-pt scale, likely representing points between 'once or twice' and 'sometimes'	
Gardinetti[98]	No significant difference for victimization by or internet or text message Internet Female: 5% Male: 10% Text Message Female: 11% Male: 8%	Internet $\hat{p}_F - \hat{p}_M$ = -5% *Fisher's exact test* p = 0.67 OR = 0.47 (0.08 - 2.75) Text $\hat{p}_F - \hat{p}_M$ = 3% *Fisher's exact test* p = 0.99 OR = 1.38 (0.28 - 6.64)	No significant difference in perpetration by internet or text message Internet Female: 5% Male: 3% Text Message Female: 3% Male: 8%	Internet $\hat{p}_F - \hat{p}_M$ = 2% *Fisher's exact test* p = 0.99 OR = 2.0 (0.17 - 23.00) Text $\hat{p}_F - \hat{p}_M$ = -5% *Fisher's exact test* p = 0.35 OR = 0.31 (0.03 - 3.09)
Murphy[92] (Study 2)	No significant difference Female: 24% Male: 20%	$\hat{p}_F - \hat{p}_M$ = 3% χ^2 (1) = 0.36, p = 0.55 OR = 1.2 (0.63 - 2.36)	-	-
Murphy[92] (Study 1)	No significant difference Female: 33% Male: 27%	$\hat{p}_F - \hat{p}_M$ = 6% χ^2 (1) = 0.41, p = 0.52 OR = 1.37 (0.52 - 3.65)	No significant difference Female: 32% Male: 23%	$\hat{p}_F - \hat{p}_M$ = 8% χ^2 (1) = 0.56, p = 0.46 OR = 1.46 (0.53 - 4.00)
Cappadocia[34] (2006 data)	**Females significantly (p < 0.01) more likely to be victimized** Female: 10% Male: 4%	$\hat{p}_F - \hat{p}_M$ = 6.3% χ^2 (1) = 29.72 p= 0 OR = 2.99 (1.98 - 4.51) d = 0.60 (medium) R^2 = 8.4% (small)	No significant difference Female: 7% Male: 7%	$\hat{p}_F - \hat{p}_M$ = 0.5% χ^2 (1) = 0.15, p = 0.7 OR = 1.1 (0.75 - 1.52)

Cappadocia[34] (2007 data)	**Females significantly (p<0.01) more likely to be victimized** Female: 11% Male: 5%	$\hat{p}_F - \hat{p}_M$ = 6% χ^2 (1) = 20.17, p = 0 OR = 2.2 (1.55 - 3.15) d: 0.43 (small) R^2 = 4.5% (small)	No significant difference Female: 7% Male: 6%	$\hat{p}_F - \hat{p}_M$ = 1% χ^2 (1) = 1.65, p = 0.2 OR = 1.27 (0.88 - 1.83)
Vaillancourt et al.[87]	**Females significantly (p< 0.01) more likely to be victimized** than males Female: 15% Male: 10%	$\hat{p}_F - \hat{p}_M$ = 5% OR = 1.59 (1.45 - 1.75) χ^2 (1) = 96.89, p= 0 d = 0.20 (small) R^2= 1.04% (small)	No significant difference Female: 10% Male: 9%	$\hat{p}_F - \hat{p}_M$ = 1% OR = 1.07 (0.97 - 1.19) χ^2 (1) = 1.75, p = 0.19 R^2 = <1%
Blais[32]	**Females significantly (p < 0.01) more likely to be victimized** Female: 40% Male: 24%	$\hat{p}_F - \hat{p}_M$ = 16% χ^2 (1) = 13.47, p = 0.0002 OR = 2.12 (1.42 - 3.19) d = 0.41 (small) R^2 = 4.1% (small)	**Females significantly (p < 0.01) more likely to have perpetrated than males** Female: 30% Male: 19%	$\hat{p}_F - \hat{p}_M$ = 11% χ^2 (1) = 7.05, p = 0.008 OR = 1.79 (1.16 - 2.76) d = 0.32 (small) R^2 = 2.51% (small)
Mishna et al.[73] (Aggression)	**Females significantly (p < 0.05) more likely to be victimized** (The average percentage of cyberbullied students across the 7 different forms was 16% for females and 14% for males)	χ^2 (2) = 9.0, p = 0.01 *V* = 0.07 (small)	No significant difference (The average percentage of cyberbullies across the 7 different forms was 10% for females and 11% for males)	- *Cannot be calculated from available data (error term cannot be computed)*
Wade & Beran[74]	**Females were significantly (p < 0.05) more likely to have been victimized** than males for 6 of 7 types of cyberbullying 5-point Likert scale mean was 0.30 for females and 0.16 for males, points between 'never' and 'once or twice'	δ = 0.06 - 0.18 (very small to small)	No significant difference	-

Up to 12 Month Prevalence				
Laprise[106]	**Females significantly ($p < 0.05$) more likely to have been victimized** Female: 7% Male: 4%	$\hat{p}_F - \hat{p}_M = 3\%$ χ^2 (1) = 296.3, p = 0 OR = 1.86 (1.73 - 1.99) d = 0.34 (small) R^2 = 3% (small)	-	-
Cassidy et al. [94]	-	-	No significant difference Female: 29% Male: 21%	$\hat{p}_F - \hat{p}_M = 8\%$ χ^2 (1) = 2.91, p = 0.09 OR = 1.53 (0.91 - 2.58)
Buchanan[84]	**Females significantly ($p < 0.001$) more likely to have been victimized** Female: 26% Male: 19%	$\hat{p}_F - \hat{p}_M = 7\%$ χ^2 (1) = 230.04, p = 0 OR = 1.43 (1.36 - 1.49) d = 0.20 (small) R^2 = 1% (small)	**Females significantly ($p < 0.001$) more likely to have perpetrated** Female: 26% Male: 24%	$\hat{p}_F - \hat{p}_M = 2\%$ χ^2 (1) = 22.8, p = 0 OR = 1.11 (1.06 - 1.16) d = 0.06 (very small) R^2 = <1% (very small)
Stys [93] (EBQ)	No significant difference between females and males victimized in at least one way Female: 40% Male: 36%	$\hat{p}_F - \hat{p}_M = 5\%$ χ^2 (1) = 0.47, p < 0.49 OR = 1.21 (0.70 - 2.11)	No significant difference between females and males perpetrating in at least one way Female: 37% Male: 28%	$\hat{p}_F - \hat{p}_M = 9\%$ χ^2 (1) = 1.94, p = 0.16 OR = 1.51 (0.85 - 2.68)
CPCO[102]	No significant difference Female: 11% Male: 15%	$\hat{p}_F - \hat{p}_M = -3\%$ χ^2 (1) = 0.2, p = 0.65 OR = 0.75 (0.22 - 2.57)	No significant difference Female: 0% Male: 4%	$\hat{p}_F - \hat{p}_M = -4\%$ *Fisher's exact test* p = 0.48
Bonanno & Hymel[99]	No significant difference Female: 10% Male: 12%	$\hat{p}_F - \hat{p}_M = -2\%$ χ^2 (1) = 0.23, p < 0.63 OR = 0.86 (0.45 - 1.62)	No significant difference Female: 8% Male: 15%	$\hat{p}_F - \hat{p}_M = -7\%$ χ^2 (1) = 2.26, p < 0.13 OR = 0.48 (0.26 - 0.91)
Smith et al.[115]	**Females significantly ($p < 0.01$) more likely to be victims.**	Magnitude of effect not reported; an absolute difference as small as	-	-

		0.6% would be significant given the size of the sample (~30K)		
Paglia-Boak et al.[110]	**Females significantly (p < 0.001) more likely to be victims** Female: 28% Male: 15%	$\hat{p}_F - \hat{p}_M = 13\%$ χ^2 (1) = 226.65, p = 0 OR = 2.17 (1.96 - 2.41) d = 0.43 (small) R^2 = 4.4% (small)	-	-
Pettalia[112]	**Females significantly (p < 0.01) more likely to have been victimized** Female: 69% Male: 50%	$\hat{p}_F - \hat{p}_M = 19\%$ χ^2 (1) = 9.7, p = 0.002 OR = 2.26 (1.35 - 3.78) d = 0.45 (small) R^2 = 4.8% (small)	**Females significantly (p < 0.01) more likely to have perpetrated** Female: 56% Male: 39%	$\hat{p}_F - \hat{p}_M = 17\%$ χ^2 (1) = 7.0, p = 0.008 OR = 1.97 (1.19 - 3.27) d = 0.37 (small) R^2 = 3.4% (small)
Jackson et al.[95]	No significant difference Female: 40% Male: 38%	$\hat{p}_F - \hat{p}_M = 2\%$ χ^2 (1) = 0.15, p = 0.78 OR = 1.09 (0.71 - 1.67)	-	-
Pandori[111]	**Males significantly (p < 0.01) more likely to have been victimized** in at least one way Female: 28% Male: 40%	$\hat{p}_F - \hat{p}_M = -12\%$ χ^2 (1) = 258.81, p < 0.001 OR = 0.59 (0.55-0.63) d = -0.26 (small) R^2 = 2.1% (small)	**Females significantly (p < 0.01) more likely to perpetrate** in at least one way Female: 26% Male: 17%	$\hat{p}_F - \hat{p}_M = 9\%$ χ^2 (1) = 192.2, p = 0 OR = 1.72 (1.59 - 1.86) d = 0.30 (small) R^2 = 2.2% (small)
Lifetime Prevalence				
Li[38]	No significant difference Female: 26% Male: 25%	$\hat{p}_F - \hat{p}_M = 0.6\%$ χ^2 (1) = 0, p = 0.95 OR = 1.02 (0.58 - 1.77)	**Males significantly (p<0.05) more likely to perpetrate** Female: 12% Male: 22%	$\hat{p}_F - \hat{p}_M = -10\%$ χ^2 (1) = 4.44, p = 0.04 OR = 0.49 (0.25 - 0.96) d= -0.39 (small) R^2= 3.7% (small)
Beran & Li[47]	No significant difference	-	No significant difference	-

Cochrane[101]	**Females significantly (p < 0.01) more likely to be victims** Female: 59% Male: 36%	$\hat{p}_F - \hat{p}_M = 23\%$ χ^2 (1) = 20.56, p = 0 OR = 2.58 (1.70 - 3.98) d = 0.52 (medium) R^2 = 6.4% (small)	**Females significantly (p < 0.04) more likely to perpetrate** Female: 39% Male: 29%	$\hat{p}_F - \hat{p}_M = 10\%$ χ^2 (1) = 4.11, p = 0.04 OR = 1.56 (1.01 - 2.39) d = 0.25 (small) R^2 = 1.5% (small)
McLean[108]	No significant difference between the proportion of students who had never been bullied Female: 28% Male: 26%	$\hat{p}_F - \hat{p}_M = 2\%$ χ^2 (1) = 0.34, p = 0.56 OR = 1.13 (0.74 - 1.72)	**Males significantly (p < 0.05) more likely to perpetrate** Female: 23% Male: 32%	$\hat{p}_M - \hat{p}_F = -8\%$ χ^2 (1) = 3.9, p < 0.048 OR = 0.65 (0.43 - 0.998) d= -0.24 (small) R^2 = 1.4%
Magaud et al.[107]	No significant difference	-	-	-
Perreault[76]	**Females significantly (p<0.05) more likely to have been victimized** Female: 23% Male: 15%	$\hat{p}_F - \hat{p}_M = 8\%$ χ^2 (1) = 6.64, p = 0.01 OR = 1.69 (1.13 - 2.54) d = 0.29 (small) R^2 = 2.1% (small)	-	-
Pisch[113]	Females significantly (p<0.01) more likely to be victims Female: 52% Male: 35%	$\hat{p}_F - \hat{p}_M = 17\%$ χ^2 (1) = 13.6, p = 0.0002 OR = 1.58 (1.08 - 2.31) d = 0.25 (small) R^2 = 1.6% (small)	No significant difference Female: 35% Male: 27%	$\hat{p}_F - \hat{p}_M = 8\%$ χ^2 (1) = 3.54, p = 0.06 OR = 1.46 (0.98 - 2.16)
Microsoft[109]	**Females significantly more likely (p < 0.01) to be victims** Female: 53% Male: 37%	$\hat{p}_F - \hat{p}_M = 15\%$ χ^2 (1) = 7.12, p = 0.0076 OR = 1.87 (1.18 - 2.96) d = 0.35 (small) R^2 = 2.9% (small)	-	-
Steeves[88]	**Females significantly (p < 0.001) more likely to be victims of**	*Mean & cruel online behaviour*	**Males significantly (p < 0.001) more likely to be**	*Mean & cruel online behaviour*

	mean and cruel behavior Female: 43% Male: 33% **Males were significantly ($p < 0.001$) more likely to be victims of threats** Female: 25% Male: 36%	$\hat{p}_F - \hat{p}_M = 10\%$ χ^2 (1) = 50.19, p = 0 OR = 1.53 (1.36 - 1.72) d = 0.35 (small) R^2 = 2.9% (small) *Threats* $\hat{p}_F - \hat{p}_M = -11\%$ χ^2 (1) = 66.2, p = 0 OR = 0.59 (0.52 - 0.67) d= -0.29 (small) R^2= 2.1% (small)	**perpetrators of mean and cruel online behavior** Female: 20% Male: 26% **Males significantly ($p < 0.001$) more likely to have made threats** Female: 5% Male: 12%	$\hat{p}_F - \hat{p}_M = -6\%$ χ^2 (1) = 21.71, p = 0 OR = 0.71 (0.62 - 0.82) d = -0.18 (very small) R^2 = <1% (very small) *Threats* $\hat{p}_F - \hat{p}_M = -7\%$ χ^2 (1) = 72.17, p = 0 OR = 0.39 (0.31 - 0.49) d = -0.52 (medium) R^2 = 6.3% (small)
Van Ingen[118]	-	-	No significant difference	F (5, 128) = 1.985, p = 0.085

Table 16. Prevalence of cyberbullying victimization and perpetration by age/grade.

Effect sizes are shown for statistically-significant differences ($p < 0.05$).

Study	Victimization	Effect Size	Perpetration	Effect Size
1-to-3-Month Prevalence				
Wong[119] *Grades 6-7*	No significant difference in victimization between grade 6 and 7 students	-	No significant difference in perpetration between grade 6 and 7 students Grade 6: 7% Grade 7: 8%	$\hat{p}_7 - \hat{p}_6 = 1\%$ χ^2 (1) = 0.08, p = 0.78 OR = 1.18 (0.48-2.88)
Totten et al.[117] *Grades 4 to 12*	**Grade 8-12s significantly* (p< 0.01) more likely to be victims** than grade 4 to 7 students Grade 4 to 7: 5% Grade 8 to 12: 11%	$\hat{p}_{8\text{-}12} - \hat{p}_{4\text{-}7} = 6\%$ χ^2 (1) = 22.57, p = 0.0000 OR = 2.63 (1.74 - 3.96) d = 0.53 (medium) R^2 = 7% (small)	**Grade 8-12s significantly* (p< 0.01) more likely to perpetrate** than grade 4 to 7 students Grade 4 to 7: 6% Grade 8 to 12: 10%	$\hat{p}_{8\text{-}12} - \hat{p}_{4\text{-}7} = 4\%$ χ^2 (1) = 10.56, p = 0.0012 OR = 1.88 (1.28 - 2.76) d = 0.35 (small) R^2 = 3% (small)
Steckley[85] *Grades 4 to 7*	**Significant (p < 0.01) differences in victimization between grades** Grade 4: 6% Grade 5: 10% Grade 6: 17% Grade 7: 14%	χ^2 (3) = 18.85, p = 0.000 *V* = 0.07 (very small)	**Significant (p < 0.01) differences in victimization between grades** Grade 4: 2% Grade 6: 11%	*V* = 0.08 (small) *(Calculated assuming equal rates in gr. 5 and 7)*
Stanton[91] **(National)** *Ages 10 to 17*	No significant difference	F = 1.22, p = 0.30	No significant difference	F = 0.10, p = 0.96

Study	Victimization	Effect Size	Perpetration	Effect Size
	5-pt scale item means show increasing trend from 1.32 at age 10 to 11 to 1.52 at age 16 to 17		*5-pt scale item means show no trend: 1.10 at age 10 to 11 to 1.10 at age 16 to 17*	
Murphy[92] **(Study 2)** *Grades 7 to 10*	Boys Girls Grade 7: 0% 0% Grade 8: 0% 10% Grade 9: 28% 32% Grade 10: 9% 38%	Effect of grade on prevalence was not tested; unable to test significance with available data	-	-
Cappadocia[34] **(2006 data)** *Grades 9 to 11*	No significant difference between grade 9 students and grade 10 to 11 students. Grade 9: 7% Grade 10 and 11: 7%	$\hat{p}_{10/11}$-$\hat{p}_9$ = -0.5% χ^2 (1) = 0.18, p = 0.67 OR = 0.93 (0.65 - 1.31)	No significant difference between grade 9 students and grade 10 to 11 students. Grade 9: 7% Grade 10 and 11: 7%	$\hat{p}_{10/11}$-$\hat{p}_9$ = -0.2% χ^2 (1) = 0.03, p = 0.86 OR = 0.97 (0.68 - 1.38)
Cappadocia[34] **(2007 data)** *Grades 10 to 12*	**Grade 10 students significantly (p < 0.05) more likely to be victims** than grade 11 to 12 students Grade 10: 10% Grade 11 to 12: 7%	$\hat{p}_{10/11}$ - $\hat{p}_9$ = -3% χ^2 (1) = 4.67, p = 0.03 OR = 0.70 (0.50 - 0.97) d = -0.20 (small) R^2 = 1% (small)	No significant difference between grade 10 students and grade 11 to 12 students Grade 10: 7% Grade 11 to 12: 6%	$\hat{p}_{10/11}$ - $\hat{p}_9$ = -0.8% χ^2 (1) = 0.50, p = 0.48 OR = 0.86 (0.60 - 1.24)
Vaillancourt[87] *Grades 4 to 12*	**Cyber-victimization varies significantly (p < 0.01) with grade** Grades 4 to 5: 11% Grades 6 to 8: 13% Grades 9 to 10: 14% Grades 11 to 12: 10%	χ^2 (3) = 22.78, p < 0.001 *V* = 0.02 (very small)	**Perpetration varies significantly (p < 0.01) with grade** Grades 4 to 5: 7% Grades 6 to 8: 10% Grades 9 to 10: 13% Grades 11 to 12: 11%	χ^2 (3) = 64.72, p = 0.001 *V* = 0.04 (very small)

Study	Victimization	Effect Size	Perpetration	Effect Size
Blais[32] *Grades 9 to 12*	No significant difference in victimization between students in grades 9 to 12	$F_{2,359} = 0.57$, $p > 0.05$ *Over 3 bullying groups*	No significant difference in perpetration between students in grades 9 to 12	$F_{2,359} = 0.06$, $p > 0.05$ *Over 3 bullying groups*
Mishna et al.[73] **(Aggression)** *Grades 6,7, 10, & 11*	The average percentage of cyberbullied students across the 7 different forms was 60% for grade 6 and 7 students vs. 54% for grade 10 and 11 students	Cannot be calculated from available data (error term cannot be computed because item intercorrelations are unknown)	The average percentage of cyberbullied students across the 7 different forms was 57% for grade 6 and 7 students versus 53% for grade 10 and 11 students	Cannot be calculated from available data (error term cannot be computed because item intercorrelations are unknown)
Wade & Beran[74] *Grades 6, 7, 10, & 11*	**Grade 7 students significantly ($p < 0.001$) more likely to be victimized** than grade 6 or 11 students by 3 of 7 forms of cyberbullying (name calling, threats, and rumours) Across these three types of victimization, the mean score (5-pt scale) was 0.23 in grade 6, 0.55 in grade 7, and 0.22 in grade 11.	$\Delta = 0.00$ - 0.14 (very small-small) Cannot be calculated from available data (error term cannot be computed because item intercorrelations are unknown)	**Grade 7 students significantly ($p < 0.001$) more likely to be perpetrators** than grade 6 or 11 students for 3 of 6 forms of cyberbullying (name calling, rumours, and impersonation) Across these three types of perpetration, the mean score (5-pt scale) was 0.11 in grade 6, 0.28 in grade 7, and 0.20 in grade 11.	$\Delta = 0.00$ - 0.16 (very small-small) Cannot be calculated from available data (error term cannot be computed because item intercorrelations are unknown)
4-to-12-Month Prevalence				
Buchanan[84] *Grade 8 to 12*	**Cyber-victimization varies significantly ($p < 0.01$) with grade**	χ^2 (4) = 101.07, $p = 0.000$ $V = 0.02$ (very small)	**Perpetration varies significantly ($p < 0.01$) with grade**	χ^2 (4) = 85.42, $p = 0.000$ $V = 0.02$ (very small)

Study	Victimization	Effect Size	Perpetration	Effect Size
	Grade 8: 22% Grade 9: 26% Grade 10: 24% Grade 11: 22% Grade 12: 20%		Grade 8: 23% Grade 9: 27% Grade 10: 27% Grade 11: 25% Grade 12: 22%	
Stys[93] (EBQ) *Grades 9 to 11*	No significant difference between grade 9 and 10 students	-	No significant difference between grade 9 and 10 students	-
Bonanno & Hymel[99] *Grades 8 to 10*	No significant difference ($p > 0.01$)	-	No significant difference ($p > 0.01$)	-
Paglia-Boak[110] *Grades 7 to 12*	**Cyber-victimization varies significantly ($p < 0.01$) with grade** Grade 7: 20% Grade 8: 23% Grade 9: 25% Grade 10: 21% Grade 11: 24% Grade 12: 18%	χ^2 (5) = 32.25, p = 0.000 *V* = 0.03 (very small) Note that the paper reports a non-significant effect of grade based on a univariate chi-square statistic (p. 93)	-	-
Jackson et al.[95] *Grades 9 to 11* Grade information was found in another paper[94] based on the same data.	Authors note that "age 14 comes up time and time again in this study as being a key age…for being victimized"(p. 391)	No statistical tests were computed; cannot be substantiated from reported data	Trend for perpetration to peak at age 12 to 14 Age 11: 17% Age 12 to 14: 25% Age 15: 19%	No statistical tests were computed; significance cannot be calculated from available data
Lifetime Prevalence				
Cochrane[101] *Grades 7 to 9*	**Significant ($p < 0.01$) positive association between victimization and grade**	R_{ranks} = .194 R^2 = 3.8% (small)	**Significant ($p < 0.01$) positive association between perpetration and grade**	R_{ranks} = .218 R^2= 4.8% (small)

Study	Victimization	Effect Size	Perpetration	Effect Size
	Grade 7: 35% Grade 8: 47% Grade 9: 58%	χ^2 (2) = 15.14, p= 0.001 *V* = 0.14 (small)	Grade 7: 20% Grade 8: 29% Grade 9: 45%	χ^2 (2)= 21.25, p= 0.000 *V* = 0.16 (small)
Stadey[116] *Grades primary to 12*	**Significant positive association (p < 0.05) between victimization and grade** Elementary: 34% Middle School: 38% High School: 46%	χ^2 (2) = 8.6, p < 0.05 ϕ^2 = 0.01 (small)	**Significant positive association (p < 0.01) between victimization and grade** Elementary: 7% Middle School: 22% High School: 30%	χ^2 (2) = 47.3, p < 0.01 ϕ^2 = 0.06 (small)
Magaud et al.[107] *Age range not reported (μ = 16.7, s^2 = 3.3)*	No significant differences	-	No significant differences	-
Perreault[76] *Ages 15 to 19*	No significant difference Age 15 to 17: 19% (n = 575) Age 18-19: 15% (n = 247)	χ^2 (2) = 1.87, p < 0.17 OR = 0.75 (0.50 - 1.13) *Data weighted to represent population*	-	-
Pisch[113] *Grades 11 to 12* (Grade 10 excluded; only 4% of sample)	No significant difference between grade 11 and 12 Grade 11: 41% Grade 12: 45%	$\hat{p}_{12} - \hat{p}_{11}$ = 4% χ^2 (1) = 0.74, p = 0.39 OR = 1.18 (0.81 - 1.71)	No significant difference between grade 11 and 12 Grade 11: 28% Grade 12: 33%	$\hat{p}_{12} - \hat{p}_{11}$ = 5% χ^2 (1) = 1.12, p = 0.29 OR = 1.24 (0.83 - 1.85)
Microsoft[109] *Ages 8 to 17*	Online bullying is higher for children aged 8 to 12 versus 13 to 17 Age 8 to 12: 40% Age 13 to 17: 27%	Cannot be calculated from available data (sample size by age not reported)	-	-

Study	Victimization	Effect Size	Perpetration	Effect Size
Steeves[88] *Grades 4 to 11*	*Mean and Cruel Behaviour* **Victimization varies significantly (p < 0.01) with grade** Grade 4: 22% Grade 5: 30% Grade 6: 32% Grade 7: 37% Grade 8: 43% Grade 9: 46% Grade 10: 48% Grade 11: 46% *Threats* Grade 4: 15% Grade 5: 19% Grade 6: 22% Grade 7: 30% Grade 8: 34% Grade 9: 41% Grade 10: 39% Grade 11: 40%	*Mean and Cruel Behaviour* χ^2 (7) = 137.21, p = 0.000 *V* = 0.06 (very small) *Threats* χ^2 (7) = 182.50, p = 0.000 *V* = 0.07 (very small)	*Mean and Cruel Behaviour* **Perpetration varies significantly (p < 0.01) with grade** Grade 4: 7% Grade 5: 8% Grade 6: 11% Grade 7: 19% Grade 8: 31% Grade 9: 32% Grade 10: 32% Grade 11: 38% *Threats* Grade 4: 3% Grade 5: 4% Grade 6: 6% Grade 7: 8% Grade 8: 9% Grade 9: 14% Grade 10: 11% Grade 11: 13%	*Mean and Cruel Behaviour* χ^2 (7) = 332.83, p = 0.000 *V* = 0.10 (small) *Threats* χ^2 (7) = 75.89, p = 0.000 *V* = 0.05 (very small)
Van Ingen[118] *Grades 7 to 9*	-	-	No significant differences (grade, gender, ethnicity)	F (5, 128) = 1.985, p = 0.085