Examining the Relationships between Aggression, Bullying, and Cyberbullying among
University Students in Saskatchewan

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Saskatoon

By
John-Etienne Myburgh

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Abstract

While cyberbullying research has grown exponentially in the past decade, little attention has been paid to cyberbullying among postsecondary students and to informing research through the use of theory. In addition, definitional concerns abound, as scholars continue to disagree whether cyberbullying is a similar or discrete construct from traditional bullying. Attempts to demonstrate that the core components of traditional bullying—repetition, the intent to harm, and the presence of a power differential—are present in cyberbullying instances have produced mixed results. Additionally, cyberbullying presents with myriad unique features, including anonymity, the amplification of harm, and the particular medium (i.e., text or pictorial) through which the bullying act is conveyed. This study utilized survey methodology to assess the relationships between aggression, bullying, and cyberbullying among a sample of 398 university students, while also testing a novel theory of aggression (the I^3 Model; Finkel, 2014) to explicate the findings. Results indicate that a high percentage of university students were cyberbullying victims (84.7%) and perpetrators (70.6%). In addition, the only definitional component to predict cyberbullying victimization was repetition. Finally, moderation analyses provided evidence that Internet addiction served as an instigating trigger while proactive aggression served as an impellor; however, none of the models were mediated by gender. While the current study was limited by its cross-sectional methodology, as well as certain concerns related to measurement and study design, the results indicate the utility of the I^3 Model in conceptualizing cyberbullying incidents and the need to better conceptualize the measurement of the definitional components of aggression, bullying, and cyberbullying.

Keywords: bullying; cyberbullying; postsecondary; proactive aggression; definitions; I^3 Model

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S. D. G.

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List of Abbreviations

BBPS   Bullying Behaviours among Postsecondary Students Questionnaire

BCa   Bias-corrected and accelerated [confidence interval]

CDBQ   Cyberbullying Definitions and Behaviours Questionnaire

CI   Confidence interval

GAM   General Aggression Model

IAT   Internet Addiction Test

RAT   Routine Activities Theory

RPQ   Reactive-Proactive Aggression Questionnaire

SWB   Subjective well-being

SWLS   Satisfaction with Life Scale

Chapter One: Introduction

The following section begins with a description of the purpose and importance of the current study. Definitions of bullying and cyberbullying are provided, followed by a discussion of the inconsistencies of current research involving these terms. An overview of the chapters of this thesis is then provided, followed by a series of definitions for various terms utilized throughout this thesis.

Purpose and Importance of Current Study

While bullying—and more recently, cyberbullying—research has been produced at an exponential rate over the past decade, definitional problems continue to abound in the extant literature (Berne et al., 2013; Kowalski, Giumetti, Schroeder, & Lattanner, 2014; Smith, del Barrio, & Tokunaga, 2013; Tokunaga, 2010; Walker, Craven, & Tokunaga, 2013). For instance, while many consider cyberbullying to be an electronic extension of traditional bullying, empirical research inconsistently demonstrates that cyberbullying acts meet the definitional criteria of traditional bullying (Gibb & Devereux, 2016; Law, Shapka, Domene, & Gagné, 2012; Nocentini et al., 2010; Smith et al., 2013). As bullying is considered a form of aggression (Olweus, 1994; Underwood, 2003), cyberbullying, by default, is also considered to be an aggressive act. However, cyberbullying occurrences do not always meet the definitional thresholds of bullying behaviours, through failing to demonstrate one (or more) of the three foundational components of bullying: the presence of a power differential, an intent to harm, and the use of repetition.

In addition, most research to date focuses on the cyberbullying experiences of students in primary and secondary school, with very few studies examining the prevalence and understandings of cyberbullying among postsecondary students (Gibb & Devereux, 2016). While research has demonstrated high prevalence rates of cyberbullying among primary and secondary students (Kowalski et al., 2014), other scholars have posited an inverted-U hypothesis that depicts cyberbullying as decreasing over time (Dooley, Cross, Hearn, & Treyvaud, 2009; Francisco, Simão, Ferreira, & das Dores Martins, 2015). If the inverted-U hypothesis holds true, it is to be expected that cyberbullying instances among postsecondary students should be occurring at considerably lower rates than among primary and secondary students. However, this hypothesis has received very little inquiry. In addition, no studies examining the occurrence of cyberbullying among postsecondary students in Saskatchewan have been conducted.

The primary purpose of the current study, therefore, is to develop and test the

relationships between aggression, bullying, and cyberbullying among a sample of university students residing in Saskatchewan, Canada, with the intent of understanding the key definitional features that are important in delineating between bullying and cyberbullying. A secondary purpose is to explore the occurrence rate of cyberbullying perpetration and victimization among postsecondary students. The final purpose of this study is to test a novel theoretical framework for its utility in explaining cyberbullying victimization and perpetration.

Overview of Chapters

Chapter Two reviews the extant literature on bullying and cyberbullying, including the core definitional aspects of each, as well as the proposed unique components related to cyberbullying. The relevant Canadian literature on cyberbullying will then be discussed; of note is the lack of research conducted on postsecondary students' experiences with cyberbullying. While there is a general lack of information regarding cyberbullying at the postsecondary level, relevant international studies will be reviewed, which provide evidence that cyberbullying remains a pressing concern at the postsecondary level. A key thrust of this chapter is to formulate a cogent case for the need for research among postsecondary students, while also demonstrating the need to adequately determine if cyberbullying is an extension of bullying, and if so, which definitional components are foundational in establishing this relationship.

Chapter Three reviews the study's proposed methodology—specifically, the use of a cross-sectional, correlational design utilizing survey methodology to examine the relationships between the constructs of aggression, bullying, and cyberbullying—in addition to reviewing the definitional components found to be important to persons who perpetrated or experienced cyberbullying. Hypotheses for the current study will be elucidated, and the methods for testing the hypotheses will be stated. Recruitment procedures, relying on campus recruitment and purposive sampling via social media, will be discussed. In addition, the relevant measures for the current study will be reviewed, and reliability and validity evidence will be provided for each.

Chapter Four contains the results of the statistical tests performed, in addition to an evaluation of the sample characteristics. Each hypothesis will be tested statistically in order to provide evidence for or against it. Finally, Chapter Five will critique the study's results in light of the extant literature available on cyberbullying, discuss limitations of the current research endeavour, provide recommendations for future studies, and review the unique contributions of the current study.

Definitions

      Aggression: For the purposes of the current study, aggression is conceptualized as any behaviour that is performed by one person to another, with the intent to harm the target (Anderson & Bushman, 2002). In addition, the target must be motivated to avoid the harm (Anderson & Bushman, 2002; Bushman & Anderson, 2001). As well, aggressive behaviour can be classified as either proactive—that is, unprovoked, goal-directed aggressive behaviour—or reactive—that is, hostile responding to circumstances interpreted as threatening (Griffin & Gross, 2004; Salmivalli & Nieminen, 2002).

      Bullying: The most utilized definition of bullying is Olweus' (1994, 2010) formulation, which suggests that bullying is a form of peer aggression in which an asymmetrical power relationship exists between a bully and a victim which leads to intentional acts of harassment that are repetitive in nature. In addition, bullying can occur through either physical, verbal, or social means (Finger, Yeung, Craven, Parada, & Newey, 2008; Swearer, Siebecker, Johnsen-Frerichs, & Wang, 2010; Underwood, 2003).

      Cyberbullying: One of the most widely-used definitions of cyberbullying has been posited by Tokunaga (2010), which states that cyberbullying is any behaviour "performed through electronic or digital media by individuals or groups that repeatedly communicates hostile or aggressive messages intended to inflict harm or discomfort on others" (p. 278). For the purposes of this study, Tokunaga's (2010) definition will be used when referring to the phenomenon of cyberbullying.

      University students: The operational definition of *university student* for the purposes of the current study would include any student enrolled (full-time or part-time) in a university in Saskatchewan.

Chapter Two: Literature Review

Cyberbullying remains a pervasive global problem, with new research continuing to demonstrate the vast impact of technology on bullying behaviours. This chapter will begin by defining and describing aggression, bullying, and cyberbullying, in order to establish the theoretical relationships between these constructs. A review of the literature associated with cyberbullying will then be discussed, with a particular focus on Canadian studies. The prevalence of cyberbullying will be discussed within the Canadian context, with a particular focus on studies (or the lack thereof) utilizing postsecondary students as respondents. While the literature of cyberbullying among postsecondary students is sparse in general, relevant findings from international contexts—including Australia, Portugal, Turkey, and the United States—will be discussed. The important definitional components of traditional bullying and cyberbullying will then be reviewed and critiqued, with the intent of providing evidence that cyberbullying does not meet many of the criteria of traditional bullying, and, therefore, may be a discrete construct. Specifically, literature will be reviewed to determine whether cyberbullying meets the traditional bullying criteria of a power differential, the intent to cause harm to the target, repetition of the bullying behaviours, and whether these behaviours cause distress to the target. In addition, two additional criteria—whether the bullying causes distress in the victim and whether the bullying occurs without provocation—will be critiqued as part of the conceptualization of traditional bullying. Reviewing the unique components of cyberbullying— including anonymity, publicity, and the amplification of harm—will also be reviewed as a means to determine whether these unique contributors differentiate cyberbullying from traditional bullying. Relevant theories of aggression will also be reviewed, in order to establish a rationale for the selection of a novel theory of aggression for the current study. Finally, the study's purpose will be located within identified gaps within the current cyberbullying literature.

What is Aggression?

Aggression is defined as any behaviour performed by one person with the intent cause immediate harm to another person (Anderson & Bushman, 2002). In addition to the perpetrator believing that their actions will harm their target—either physically or psychologically (Shaver & Mikulincer, 2011)—the target must be motivated to avoid the behaviour (Anderson & Bushman, 2002; Bushman & Anderson, 2001). As such, unintentional harm inflicted upon a target (e.g., accidentally hitting someone) is not considered an aggressive act, nor are situations where the target receives pleasure from the pain (e.g., pain during sexual masochism; Anderson

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& Bushman, 2002).

Many subtypes of aggression have been posited, including direct or indirect, hostile or instrumental, reactive or proactive, and targeted versus targetless, to name a few (Anderson & Bushman, 2002; Bartol & Bartol, 2014; Bushman & Anderson, 2001; Buss & Perry, 1992; Salmivalli & Niemenen, 2002; Shaver & Mikulincer, 2011; Underwood, 2003). However, studies have continually found support for classifying aggression as reactive—that is, responding in a hostile manner to a behaviour or circumstance deemed as threatening—or proactive— aggressive behaviour that is goal-directed and not provoked by any particular situation or event (Bartol & Bartol, 2014; Levesque, 2011; Strenziok, Krueger, & Grafman, 2013).[1] Raine and colleagues (2006) found that reactive and proactive aggression could be assessed via self-report with children as young as age seven. In addition, these authors found that reactively aggressive behaviours were endorsed more regularly, suggesting that reactive aggression is more associated with typical development. Conversely, these authors found that proactive aggression was more associated with psychopathic traits, flat affect, and delinquency.

Certain developmental trajectories have also been associated with aggression. Specifically, aggression is thought to decrease as children become older (Naylor, 2011). In addition, as children develop, aggressive behaviour tends to move from physical acts to verbal and social acts (Naylor, 2011). This change may largely be due to the development of language and social skills, which shifts the modalities through which aggression is enacted. Finally, as adolescents begin to be able to engage in perspective-taking, aggressive acts tend to become more sophisticated and subtle, and with the onset of increased emotional regulation, adolescents are able to hurt others more effectively through planning to cause intentional harm (Naylor, 2011).

What is Bullying?

In general, bullying is considered to be a form of peer aggression that is differentiated from other forms of peer harassment by three criteria: repetition, intent to harm, and the presence of a power imbalance between victim and perpetrator (Olweus, 1994, 2010). That is, bullying is a unique set of behaviours that comprises a subset of proactive aggression (Goldsmid & Howie, 2014; Griffin & Gross, 2004; Salmivalli & Nieminen, 2002). In traditional bullying research, a

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[1] Note that certain scholars do not see any difference between proactive/reactive aggression and instrumental/hostile aggression (e.g., Levesque, 2011; Strenziok et al., 2013), which may largely be due to overreliance on measures of aggression with poor psychometric properties (see Paulhus, Curtis, & Jones, 2017 for a review).

power differential—the existence of an asymmetric power relationship between two individuals (Olweus, 2010)—is thought to be present between two parties in a bullying relationship. Power differentials are usually evidenced by the fact that the victim cannot easily defend themselves, and thus primarily focus on the difference in strength between both parties (Olweus, 2010); however, others have posited that power differentials may also be evidenced by differences in social status, resources, or popularity (Bauman, 2013).

Repetition of bullying behaviours is considered another hallmark of bullying (Olweus, 1994, 2010). As a subset of aggression, bullying is differentiated from other forms of aggressive behaviour by the fact that it is an ongoing, rather than discrete, event. In addition, intent to harm is a necessary component for an event to be considered bullying (Olweus, 1994, 2010). Intent to harm can be enacted through physical, social, emotional, or relational means (Swearer et al., 2010). In addition, intent to harm must be established through three criteria being met: (1) The victim experienced harm, not merely the threat of harm; (2) The perpetrator intended to harm the victim, and did not merely engage in the action; and, (3) A reasonable person would deem the action as foreseeably causing harm to the victim (Smith et al., 2013).

Most researchers concur that bullying can be expressed through physical, verbal, social, or relational means (Card & Hodges, 2008; Finger et al., 2008; Swearer et al., 2010). However, difficulties abound in determining the exact formulation of potential subtypes for this subset of aggression. For instance, Card and Hodges (2008) argue that there is no difference between social, indirect, or relational aggression, stating that all three terms are referring to the same set of socially excluding behaviours. Other researchers argue that bullying aggression should be viewed as either direct or indirect (Juvonen & Graham, 2014), thereby simplifying the typologies associated with bullying behaviours. Underwood (2003) proposed a typology of aggressive behaviour consisting of verbal, social, and physical aggression (see Figure 2-1). To aid in definitional clarity, Underwood (2003) argued that the term "social aggression" best captures the intent of the related actions, which is to socially harm the target through either verbal or nonverbal means while utilizing overt or covert strategies.

Underwood's (2003) typology has demonstrated concurrence with other research programs (e.g., Card & Hodges, 2008). In addition, instruments have been developed that reliably distinguish between verbal, social, and physical aggression (Marsh et al., 2011), providing additional empirical support for Underwood's (2003) typological construction.
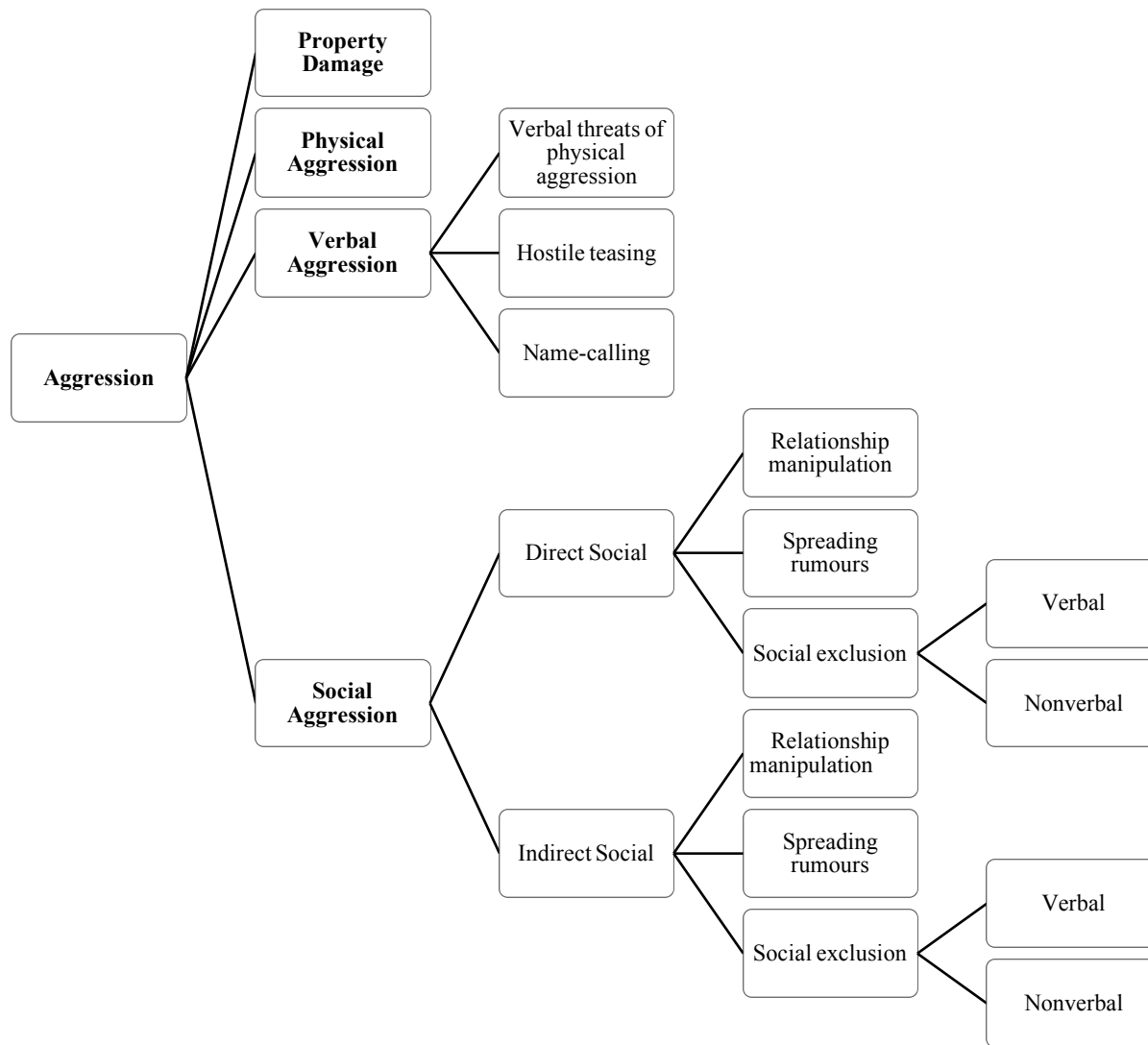
Figure 2-1. Underwood's (2003) typology of aggressive behaviour.

Among postsecondary students, Goldsmid and Howie (2014) created a bullying instrument that demonstrated a three-factor structure (factor 1: physical aggression; factor 2: verbal aggression; factor 3: social aggression) which concurred with Underwood's (2003) typology. As such, research is continuing to provide evidence of a three-factor structure for bullying, which can serve in helping to understand bullying behaviours among adolescent and postsecondary students.

What is Cyberbullying?

Cyberbullying remains a phenomenon that lacks an adequate definition (Berne et al., 2013; Kowalski et al., 2014; Smith et al., 2013; Tokunaga, 2010; Walker et al., 2013). That is, while cyberbullying is a widely-discussed concept, experts vary in how they frame this behaviour. For many, cyberbullying is considered an extension of traditional bullying, evidenced through definitions like Tokunaga's (2010), in which cyberbullying is defined as any behaviour "performed through electronic or digital media by individuals or groups that repeatedly communicates hostile or aggressive messages intended to inflict harm or discomfort on others" (p. 278). Many consider cyberbullying to be an additional branch of bullying, differentiated from social, verbal, and physical aggression only by the unique features of the online environment (Craven, Marsh, & Parada, 2013). However, the assumption that cyberbullying is akin to traditional bullying, with the exception of a change in modality, has yet to be convincingly demonstrated. Researchers have pointed out that cyberbullying differentiates itself from traditional bullying due to certain unique features related to the modality. For example, the relative anonymity of the perpetrator, a lack of online supervision, and ease of accessibility of the victim have all been posited as unique features of cyberbullying that differentiates it significantly from traditional bullying (Tokunaga, 2010).

Researchers have also posited that, compared to traditional bullying, cyberbullying amplifies the harm caused to a victim due to the potential large audience of bystanders that can witness the cyberbullying incident, the anonymous transmission of harmful content, and the inability to escape harassment due to the online environment through which it occurs (Dempsey, Sulkowski, Nichols, & Storch, 2009; Fredstrom, Adams, & Gilman, 2011; Mishna, Saini, & Solomon, 2009; Mitchell, Jones, Turner, Shattuck, & Wolak, 2015; Sticca & Perren, 2013). In summary, while some researchers have posited that cyberbullying is mainly an online version of traditional bullying, additional work is necessary in order to determine whether the definitional components of cyberbullying demonstrate a distinct subset of behaviours. In order to demonstrate the scope of the problem, a brief review of extant Canadian and international studies will be conducted. While the

results demonstrate that cyberbullying remains a pressing concern, the paucity of information regarding cyberbullying at the postsecondary level suggests a need for additional research in this vital area.

Prevalence of Cyberbullying: A Canadian Lens

Cyberbullying remains a pressing societal concern, with current research demonstrating that somewhere between 10 to 40% of American youth experiencing regular experiences of cyber-victimization (Kowalski et al., 2014). While most of the research has been, and continues to be, conducted in the United States, several researchers have begun to bring a Canadian perspective to the field. Of note is the lack of current research available on cyberbullying among postsecondary students. While extensive studies have been conducted on secondary students, to date only two studies have examined the problem of cyberbullying among university students.

Cyberbullying among secondary students. The seminal Canadian study (Beran & Li, 2005) examined cyberbullying among a sample ($n = 432$) of middle-school (Grades 7 to 9) students in Calgary, Alberta. Students were provided with a definition of harassment (Olweus, 1996), which focused on repetition, the intent to harm, and the presence of a power differential. Beran and Li (2005) found that 58% of students surveyed had experienced at least one incident of cyberbullying, while 26% reported engaging in cyberbullying activities at least once. No sex or grade differences were found for either cyberbullying perpetration or victimization. Note, however, that the current study did not specify a timeframe within which the cyberbullying had to have occurred. As increasing a timeframe increases the number of persons who may have experienced a particular phenomenon (Ybarra, 2013), the high rate of cyberbullying in this study may be artificially inflated due to this methodological limitation. However, other studies have found that rates of cyberbullying are more conservative when utilizing a global, rather than specific, measure of cyberbullying (Gradinger, Stroheimer, & Spiel, 2010), as well as in studies that provide a definition of cyberbullying (Mishna, Khoury-Kassabri, Gadalla, & Daciuk, 2012). Note, however, that Beran and Li (2005) did provide a definition of cyberbullying.

A second pioneering study (Mishna, Cook, Gadalla, Daciuk, & Solomon, 2010) found that, in a large sample of middle school (Grade 6 and 7) and high school (Grade 10 and 11) students in Ontario ($n = 2,186$), almost half (49.5%) the participants reported being cyberbullied, one-third (33.7%) reported cyberbullying others, and one-quarter (25%) reported witnessing cyberbullying within the three months preceding the study. The study also found that high-school girls were more

likely to be bullied than high-school boys, while no differences were found in the likelihood of being cyberbullied between middle-school boys and middle-school girls. In terms of the medium of cyberbullying, instant messaging (40%), email (25%), Internet games (12%), and social networking sites (10%) were found to be the most common platforms. In addition, 68% cyberbullying victims knew the identity of their perpetrator. A unique feature of this study was that a definition of cyberbullying was not provided to students; instead, involvement in cyberbullying was established based on participants' self-reported online behaviours.

Doucette (2013) sampled high school students from a single school district in southern Ontario (n = 16,145). Students were provided with a definition of bullying, which focused on intent to harm, repetition, and a power imbalance; additionally, the definition indicated that bullying could be physical, verbal, sexual, social, or cyber.[2] Overall, 21% of students reported involvement in cyberbullying behaviours at least once within the past school year, including forwarding private messages to unintended recipients (21.1%), spreading rumours online (12.4%), sending threatening electronic messages (16.8%), or posting inappropriate content of other persons without the victim's consent (11.9%). As well, 33.9% of students indicated being a victim of at least one type of cyberbullying behaviour within the past school year, including having their private messages forwarded to unintended recipients (33.9%), having rumours spread about them online (33.7%), receiving threatening electronic messages (30.5%), or having inappropriate pictures posted of themselves online without consent (24.8%). Note, however, that gender comparisons were not conducted in examining cyberbullying perpetration and victimization rates.

A study in Quebec (Cénat et al., 2014) found that 22.9% of their total student sample (n = 8,194) experienced at least once incident of cyberbullying within the past year—operationalized through responding on a Likert-type scale to the statement, "How many times someone has bullied you (rumors, intimidation, threatening, etc.) using Internet (Facebook, MySpace, MSN, email, text, etc.)"—with females experiencing significantly higher rates of cyberbullying (p < .0001), but not traditional bullying (p = .07), as compared to male participants. Experiences of cyberbullying were also found to significantly predict psychological distress (OR = 1.9) and low self-esteem (OR = 1.5). In addition, female participants were significantly more likely than males to report higher levels of psychological distress (OR = 2.7) and low self-esteem (OR = 1.8), suggesting that females may be

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[2] In the actual survey instrument, students were asked if they had been "bullied using technology" and if they had "bullied a student using technology" (Doucette, 2013, p. 63).

especially susceptible to certain negative emotional and psychological impacts related to cyberbullying. However, the cross-sectional design of this study precluded the ability to control for pre-existing psychological distress or low self-esteem and as such, causality could not be established.

In order to address the issue of causality, Holfeld and Leadbeater (2015) utilized a short-term time series design, spanning one school year in length, in order to evaluate cyberbullying perpetration and victimization among Grade 5 and 6 students sampled from predominantly rural areas (time2 M_{age} = 11.48; n = 638). Using the past 30 days as a time frame, approximately 13% of students reported perpetrating at least one of four possible types of cyberbullying behaviour, including posting something online about someone else in order to make someone laugh (9.6%), sending a text message on a cell in order to make someone mad or make fun of them (3.9%), starting a rumour online about someone (1.7%), and posting a picture of someone online that they would not want others to see (1.7%). In contrast, 26.8% of students reported being the victim of at least one cyberbullying behaviour within the preceding 30 days, including receiving a text message that made them upset or uncomfortable (17.7%), having someone post something to their online page or wall that made them feel upset or uncomfortable (12.1%), having a picture or message shared online that they would not want others to see (8.6%), or having been afraid to go online (6.7%). In terms of gender differences, females were significantly more likely to report being victims of cyberbullying, but no differences were found in terms of cyberbullying perpetration.

A recent nationally-representative Canadian study found that 13.99% of youth between the ages of 10 to 17 have been cyberbullied one or more times in the past month, while 7.99% have cyberbullied another youth within the same time period (Beran, Mishna, McInroy, & Shariff, 2015). In addition, when examining the cognitive, behavioural, and emotional impacts of cyberbullying, the responses of cyberbully victims (n = 108) differed significantly from non-victims (n = 861); however, effect sizes were very small (partial $\eta^2 \leq .06$), suggesting that the statistical differences may not be clinically meaningful. As well, cyber-victimization was significantly correlated with verbal (r = .61), social (r = .58), physical (r = .44), racial (r = .32), and sexual (r = .41) bullying (all ps < .001). Note that this study also found significant gender differences in terms of cyberbullying perpetration, finding that boys were significantly more likely to cyberbully others than girls; however, the effect size was very small (ϕ = .07).

In Beran and colleagues' (2015) study, participants were given a definition of bullying that

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auspiciously left out repetition as a requirement for an act to be bullying. Instead, the authors focused on the presence of a power differential and the intent to harm, and specified that bullying could appear in seven different forms: physical, verbal, social, electronic, racial, sexual, and sexual preference (targeting victims because of their sexual orientation). This definition is interesting in that it blurs the lines between bullying, cyberbullying, and criminal harassment by encapsulating all these behaviours under the term "bullying." This decision is also problematic in that it widens the net for what is considered bullying, and decreases the specificity of operational definitions of bullying. However, this rather broad use of bullying demonstrates the current trend in psychological research to consider cyberbullying an extension of traditional bullying, while also demonstrating the equivocal views held on what the foundational components of bullying are.

Cyberbullying among postsecondary students. While the literature demonstrates the significant impact of cyberbullying on adolescent Canadians, the voices of postsecondary students remain conspicuously absent from this domain. To date, only two Canadian studies have examined cyberbullying at the postsecondary level. The first reported Canadian study (Faucher, Jackson, & Cassidy, 2014) surveyed students from four Canadian universities ($n = 1,925$), finding that 24.1% of the sample had been cyberbullied within the past 12 months, while 5.1% had perpetrated cyberbullying within that same time period. The authors defined cyberbullying in the following manner: "Cyberbullying uses language that can defame, threaten, harass, bully, exclude, discriminate, demean, humiliate, stalk, disclose personal information, or contain offensive, vulgar or derogatory comments. Cyberbullying is intended to harm or hurt the recipient" (p. 3). Based on this definition, it is apparent that the authors focused on the intent to harm, to the exclusion of other criteria associated with bullying and cyberbullying; results, therefore, should be interpreted within this truncated definition for cyberbullying.

Of the students who were cyberbullied at least once a week, males were significantly overrepresented, which may be related to their choices of technology usage: Seventy-one percent of males who responded to this category reported being cyberbullied via online gaming. In addition, males were significantly more likely to have been cyberbullied by someone they did not know, while females were significantly more likely to have been cyberbullied by a friend or acquaintance. These findings are in contrast to other studies which have demonstrated that females are significantly more likely to be victims of cyberbullying (Genta et al., 2012; J. N. Navarro & Jasinski, 2013; R. Navarro, Serna, Martínez, & Ruiz-Oliva, 2013), suggesting that cyberbullying among postsecondary students

may be more gendered towards males. In addition, while participants in this study did not comprise a nationally representative sample, the rates of cyberbullying victimization are significantly higher than those reported in Beran and colleagues' (2015) nationally representative Canadian study. These findings are in contrast to an inverted-U hypothesis of cyberbullying, which postulates that cyberbullying rates peak during middle school years and taper off in high school and beyond (Dooley et al., 2009; Francisco et al., 2015). The current study, therefore, may indicate that the inverted-U hypothesis of cyberbullying may not be substantiated by empirical findings among Canadian postsecondary students.

Faucher and colleagues (2014) also inquired into the reasons behind why someone believed they were cyberbullied. Respondents reported that interpersonal problems, physical appearance, and gender were three common reasons for being cyberbullied; in addition, respondents also indicated that cyberbullying behaviours could have been meant as a joke, or due to differences of opinions or beliefs. Respondents who had perpetrated cyberbullying indicated that they cyberbullied another person because the person upset them, or because the person had cyberbullied them first. In addition, male perpetrators indicated that they cyberbullied others because it was fun, while female perpetrators indicated cyberbullying another person because they did not like the person. These findings suggest many similarities in the reasons to engage in cyberbullying between males and females.

The second Canadian study (Cunningham et al., 2015) sought to examine the anti-cyberbullying preferences of university students for the purposes of developing a tailored intervention to address cyberbullying. Utilizing a sample of 1,004 students and providing a definition of cyberbullying, the authors found that most students (45.7%) had witnessed cyberbullying, with relatively small percentages of students reporting being victims (5.7%), perpetrator-victims (4.9%), or perpetrators (4.5%) of cyberbullying. In addition, men were more likely to report involvement as perpetrators or perpetrator-victims, while women were more likely to report being witnesses to cyberbullying. Note, however, that the authors did not publish the definition they used, making it impossible to determine how cyberbullying was operationalized or understood by study participants. In addition, the response options for cyberbullying victimization, perpetration, and witnessing were limited (i.e., never, once, once per month, once per week, once per day), not located within a specific timeframe, and bound to only certain platforms of electronic communication (e.g., Facebook, Twitter, YouTube, text messaging); these limitations reduce the

utility of the prevalence rates by focusing on a limited range of platforms further limited by an unknown operational definition of cyberbullying while trying to globally assess for cyberbullying behaviours. Finally, participants were recruited from an introductory psychology course, with 88.6% of participants reporting being in their first year of university; as such, the rates of cyberbullying victimization do not provide clear evidence of the prevalence of cyberbullying throughout different years of degree completion.

In sum, the Canadian literature demonstrates that cyberbullying remains a concern in educational settings at the primary, secondary, and postsecondary levels. While several studies have explored cyberbullying prevalence among primary and secondary students, only two studies to date have examined cyberbullying among Canadian postsecondary students; in both cases, definitions for cyberbullying were employed, which may limit the range of behaviours participants classify as cyberbullying. In addition, Canadian research to date has been unable to substantiate the inverted-U hypothesis of cyberbullying; however, further studies are required, especially among older students, to determine the veracity of these findings.

International Findings from Postsecondary Studies of Cyberbullying

While relatively few studies have been conducted on cyberbullying among postsecondary students in general, a small literature is in existence. Studies from Australia, Portugal, Turkey, and the United States have emerged, suggesting that cyberbullying is a pressing global concern for postsecondary students.

Australia. Wensley and Campbell (2012) examined the effects of sexual orientation on bullying and cyberbullying among 528 (female = 426) first-year university students (M_{age} = 19.52, SD_{age} = 1.99). The authors provided a definition of cyberbullying which focused on repetition, intent to harm, and the presence of a power differential; in addition, cyberbullying was described as an electronic form of traditional bullying. While the majority of the sample identified as heterosexual, 17.2% (*n* = 90) identified as non-heterosexual. Results indicated that 20.3% of the total sample had been victims of traditional bullying within the past 12 months, while 11.6% had been cyberbullied within that same time frame. In the study timeframe, 18.7% of heterosexual participants were victims of traditional bullying, 4.1% perpetrated traditional bullying, 10.8% were victims of cyberbullying, and 3.2% perpetrated cyberbullying. Non-heterosexual participants were significantly more likely to have been a victim (30.8%) and perpetrator (9.9%) of traditional bullying, and a victim (15.4%) of cyberbullying, than heterosexual participants; no statistically

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significant differences were found when comparing cyberbullying perpetration (6.7%). These results provide additional evidence that sexual orientation may be a risk factor associated with bullying and cyberbullying experiences.

Portugal. Among a convenience sample of 519 students attending college or university in Lisbon and Portalegre (Francisco et al., 2015), 27.94% of respondents indicated having been the victim of cyberbullying at some point in their life, while 8% of the sample indicated engaging in cyberbullying perpetration.[3] Of particular interest is that the researchers asked participants when they had last experienced or engaged in cyberbullying, with response options being primary school, secondary school, and higher education. The authors found an inverted-U relationship between cyberbullying victimization and perpetration, indicating that cyberbullying increased between primary and secondary school, but decreased as students entered higher education.

Turkey. In order to test the relationship between psychiatric symptomatology and involvement in cyberbullying, Aricak (2009) sampled 695 Turkish undergraduate students (males = 35.5%). Cyberbullying was defined utilizing Belsey's (2008) definition: "Cyberbullying is the use of information and communication technologies to support deliberate, repeated, and hostile behavior by an individual or group that is intended to harm others" (p. 1). Utilizing a global cyberbullying question (i.e., "Have you ever engaged in cyberbullying before today?"), 19.7% of students reported engaging in cyberbullying perpetration, while 54.4% reported being cyberbullying victims. In addition, the author divided his sample into pure bullies ($n = 14$), bully-victims ($n = 123$), pure victims ($n = 255$), and non-bully-victims ($n = 303$). Significant gender differences were found: males were significantly more likely to cyberbully others compared to females, Mann-Whitney $U =$ 48405.50, $Z = -3.94$, $p < .001$. When examining psychiatric symptomatology, non-bully-victims were less likely to present with psychiatric symptoms, as measured using the Symptom Checklist-90 (SCL-90; Derogatis, Lipman, & Covi, 1973). In addition, path analysis indicated that the hostility and psychoticism subscales of the SCL-90 significantly predicted cyberbullying perpetration, while interpersonal sensitivity and psychoticism significantly predicted cyberbullying victimization. These findings provide preliminary evidence that certain factors increase the likelihood of cyberbullying involvement.

Examining the rates of cyberbullying among law students at three large universities in

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[3] Note that the study in question assessed cyberbullying from a global perspective; no definition was provided in the journal article.

Istanbul, Turan, Polat, Karapirli, Uysal, and Turan (2011) reported that 59.8% of their sample ($n =$ 579; female = 329) indicated having ever been cyberbullied before, though the definition of cyberbullying used in the study was unclear. In addition, this study examined the modalities through which cyberbullying occurred; 27.7% of participants were cyberbullied via their cellphone, 20.7% through a computer, and 51.7% through both a computer and cellphone. The authors also examined the length of time students stayed online; however, analyses were not reported which examined whether length of time was significantly associated with cyberbullying victimization.

United States. Examination of bullying among college-aged students has only recently begun to be explored in America. A recent study (Bauman & Baldasare, 2015) utilized a weighted sample ($n =$ 1,048) of college students to explore factors that predicted distress related to cyberbullying. Results indicate that victims' distress levels were highest when cyberbullying incidents involved unwanted contact (e.g., receiving an unwanted sexual message from someone) or malicious intent (e.g., being called mean names), as opposed to when these incidents involved public humiliation (e.g., having your picture altered electronically). In addition, females ($M = 12.22$, $SD = 13.15$) had significantly higher distress scores when compared to males ($M = 9.68$, $SD = 12.58$), $t(1,053) = 3.22$, $p = .001$. In addition, these authors reported that Facebook was the most common medium through which cyberbullying incidents were perpetrated, followed by texting, email, and a website (*The Dirty*), suggesting that medium may impact the likelihood of cyberbullying perpetration. A regression model demonstrated that the strongest predictors of distress were the medium—especially Facebook, email, and texting being the largest contributors—followed by the anonymity of the perpetrator and being a victim of unwanted contact.

A recent novel study (Doane, Boothe, Pearson, & Kelley, 2016) sought to examine the relationship between cyberbullying and risky online communication (e.g., sharing nude or partially nude pictures with others online; sharing passwords with others) among 577 college students ($M_{age} =$ 22.79, $SD_{age} = 7.96$). Results indicated that 84.9% of the sample had experienced at least one of the cyberbullying victimization behaviours within the past year, with 7.6% of the sample reporting experiencing at least one of these behaviours every day. In addition, a moderate positive correlation between cyberbullying victimization and risky online communication, $r = .41$, $p < .05$ was found, suggesting that engaging in certain risky behaviours may increase the likelihood of cyberbullying victimization. This study also suggests that interventions should target online risky behaviours as a means to decrease cyberbullying instances.

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In sum, literature continues to demonstrate high prevalence of cyberbullying behaviours among secondary and postsecondary students. While two studies have examined cyberbullying at Canadian postsecondary institutions, studies from across the globe suggest that cyberbullying perpetration and victimization continue to occur at high rates in this population. These findings contradict developmental theories that predict decreases in aggression as students age (Naylor, 2011). However, in order to establish that cyberbullying is in fact an aggressive behaviour and a subset of bullying, it is imperative to determine whether cyberbullying meets the criteria for traditional bullying. These definitional components will now be reviewed.

Definitional Components of Traditional Bullying

Several researchers believe that cyberbullying is merely an electronic extension of traditional bullying (Li, 2007; Olweus, 2012; Wolke, Lereya, & Tippett, 2016), as evidenced by strong positive correlations between these two behaviours (Kowalski et al., 2014), as well as strong predictive relationships through statistical modelling (Espelage, Rao, & Craven, 2013). However, it is worth considering whether cyberbullying actually meets the definitional thresholds proposed for traditional bullying. In addition, it is also worth considering whether the suggested unique features of cyberbullying constitute it being a discrete subtype of aggression. In order to examine the similarities and differences between traditional and cyberbullying, the definitional components—and the evidence for and against them—must be examined to test the utility of the assumption that bullying and cyberbullying are similar.

Power differential. While in traditional bullying settings the criterion of a power differential—in terms of physical size or popularity—can easily be assessed, online assessments for the presence of a power differential remain problematic (Law, Shapka, Domene, et al., 2012). For instance, a recent study of 733 (61.9% female) Grade 5 to 12 students (M_{age} = 15) examined the role of reactive and proactive aggression in cyberbullying incidents (Law, Shapka, Domene, et al., 2012). Exploratory factor analysis using a varimax rotation revealed a three-factor model for online aggression, with the factors labelled as aggressive messaging, developing hostile websites, and posting/commenting about embarrassing photos or videos. However, the factor analysis did not differentiate between online perpetrators, victims, or witnesses, suggesting that online aggression is differentiated based on the act, rather than on the role assumed by the persons involved.

Furthermore, exploratory factor analysis of the study's measure of reactive and proactive aggression suggested that the best fit for the model was a one-factor solution, providing further

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evidence that participants did not differentiate their online aggressive acts between reactive and proactive reasons for aggressing. While traditional bullying literature has generally found that perpetration and victimization are distinct constructs (Craven et al., 2013), this study was unable to differentiate between these constructs.[4] These findings suggest that the relationship between being a cyberbullying victim, witness, or perpetrator may not be clearly delineated. This study also found that victims are likely to retaliate against their online aggressors, challenging current understandings of the role of a power differential in the context of the act of cyberbullying.

One possible method through which a power differential could exist online is through differing levels of technological prowess or ability—that is, that cyberbullies have greater technological expertise compared to their victims (Smith et al., 2013); however, others have found that this holds true only for more sophisticated methods of cyberbullying, such as impersonating the victim (Nocentini et al., 2010). In addition, it has been suggested that a power differential cannot be separated from the intent to harm the victim (Gibb & Devereux, 2016; Nocentini et al., 2010), calling into question the utility of using a power differential as a core definitional component of cyberbullying. Certain researchers have also noted that most studies to date have not measured the construct of cyberbullying, because the presence of a power differential between victims and perpetrators could not be established (Bauman, Underwood, & Card, 2013; Smith et al., 2013). Based on the available evidence, therefore, it is unclear whether cyberbullying behaviours meet the traditional bullying criterion of a power differential.

Repetition over time. While traditional bullying generally considers repetition to be a necessary criterion, research has not demonstrated that repetition is a necessary condition for cyberbullying. For instance, a recent study of college students (Kota, Schoohs, Benson, & Moreno, 2014) found that participants did not agree that intent and repetition are necessary for bullying behaviours to be considered cyberbullying. Instead, participants stated that a single negative comment online could easily be transmitted to an undisclosed number of other readers; therefore, a single comment could be virally repetitive without being purposefully repetitive.

In another study of college students (Rafferty & Vander Ven, 2014), the authors made the conscious decision to include one-time incidents of online harassment within their definition of cyberbullying, arguing that this choice "allowed [them] to see events that would be experienced as

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[4] Note however, that subsequent studies have demonstrated the ability to differentiate between cyberbullying perpetration and victimization (Craven, Marsh, & Parada, 2013; Kowalski et al., 2014).

bullying by victims... (repeated victimization), but not necessarily by perpetrators (a one-time attack)" (p. 366). By allowing for the criterion of repetition to be met in this manner, cyberbullying behaviours could still be considered an online expression of traditional bullying.

Other researchers have argued that repetition is a subsidiary component of cyberbullying, and that what matters is whether the perpetrator intended harm to the victim (Smith et al., 2013). In addition, repetition is also being questioned as a necessary definitional component within traditional bullying, with focus being placed more on the amount of harm caused rather than the continuity of the event (Juvonen & Graham, 2014); however, this "definitional drift" may be due to the assumption that cyberbullying is an extension of traditional bullying, and the need to compensate for the amount of harm caused by discrete cyberbullying occurrences. For these reasons, it seems unlikely that cyberbullying occurrences meet the definitional criterion of repetition as assessed by studies to date.

Intent to harm. Note, however, that many cyberbullying studies assume that the perpetrator's intent was to harm the victim. However, is this a reasonable (and defensible) position? For instance, few studies to date have explicitly asked cyberbullying perpetrators whether they intended to harm the victim (Gibb & Devereux, 2014, 2016). If a perpetrator did not intend harm— for example, if they were merely joking with the victim (Gibb & Devereux, 2016) —then no intent is present, even if the victim experienced harm subjectively.

As previously mentioned, only two studies to date have explicitly asked perpetrators regarding their intent to harm a specific target. On a questionnaire of cyberbullying behaviours completed by university students ($n = 297$; $M_{age} = 22.70$), Gibb and Devereux (2014) asked students who had cyberbullied another person about the amount of distress they intended to inflict on their victim. For each cyberbullying behaviour engaged in, perpetrators were asked to rate the level of distress intended to the victim using a seven-point Likert-type scale (1 = *no distress intended* to 7 = *severe distress intended*). In addition, participants who had experienced any of the cyberbullying behaviours listed were also asked to rate their experienced distress using the same scale. Mean intended distress was 2.4 ($SD = 1.5$), with 36.1% of perpetrators indicating that they did not intend to cause the victim any distress, and 1.3% of perpetrators indicating they had intended the victim to experience severe distress. Note that experienced distress results were not reported in this study.

A recent study by Gibb and Devereux (2016) utilized the same seven-point scale, but also asked perpetrators about how much harm they *believed* they had caused the victim, as well as asking

victims about the amount of harm they had experienced from specific cyberbullying behaviours. By adding these two additional questions, the researchers were able to utilize an expanded definition of intent (i.e., requiring both the belief that the action will cause harm and the belief that the target would be motivated to avoid experiencing the behaviour; Anderson & Bushman, 2002; Bushman & Huesmann, 2010) to examine cyberbullying behaviours among college-age students. The results indicate that perpetrators ($n = 80$) intended harm to their victim ($M = 1.93$, $SD = 2.36$, 95% CI [1.46, 2.51]) and believed that their actions harmed their victim ($M = 2.62$, $SD = 2.36$, 95% CI [2.10, 3.16]). While the results were statistically significant ($ps = .001$), it is important to note that these mean scores suggest low levels of intent to harm, as well as beliefs regarding the amount of harm caused. Note, however, that participants who had been cyberbullied ($n = 199$) reported distress scores with higher means ($M = 2.70$, $SD = 2.50$, 95% CI [2.38, 3.02]) than the intent and belief distress scores, $p = .001$. This finding suggests that perceptions about the amount of harm caused are lower among perpetrators than among victims. This study did not analyze victim-bullying dyads—ratings of perpetration and victimization came from the same participant—thus, it is impossible to determine whether perpetrators and victims would have rated the distress caused by the cyberbullying event as similar. As such, it is impossible to determine whether the perpetrator's intent actually led to harm for the victim.

It is worthwhile to note the difficulties of inferring another person's intent. For instance, Dodge (2011) suggests that certain persons are conditioned to interpret another person's actions as hostile (i.e., the hostile attribution bias), and then engage in reactive aggression. As computer-mediated communication (CMC), especially as conceptualized through most social media platforms, is a low-bandwidth means of communication—that is, most forms of CMC do not support multiple linguistic and nonverbal cues to aid in the interpretation of a message (Walther, 2011)—it is possible that the meaning of a message may be misconstrued as hostile when it is, in fact, not. It may, therefore, be important to also measure whether the victim believed that the perpetrator was intending them harm, though hostile attribution biases should be controlled. In addition, as CMCs continue to evolve by increasing their abilities to support multimodal forms of interaction, intent may become more explicit and therefore easier to assess.

Intent to harm has also been difficult to demonstrate in cases of trolling, which have been linked to providing entertainment and amusement to the troll (Buckels, Trapnell, & Paulhus, 2014; Rafferty & Vander Ven, 2014). Trolling has been defined as "the attempt to hurt, humiliate, annoy,

or provoke in order to elicit an emotional response [from a person] for one's own enjoyment" (Rafferty & Vander Ven, 2014, p. 372). Studies have not clearly demonstrated the intent behind why people troll others, having presented instead a wide range of reasons for engaging in trolling, including boredom, revenge, attention seeking, pleasure, entertainment, deception, and disruption (Buckels et al., 2014; Hardaker, 2010; Shachaf & Hara, 2010, Rafferty & Vander Ven, 2014). However, Buckels and colleagues (2014) demonstrated significant positive correlations between trolling and sadism ($r = .52$, $p < .001$), Machiavellianism ($r = .37$, $p < .001$), and psychopathy ($r = .38$, $p < .001$)—the so-called Dark Triad of Personality (Paulhus & Williams, 2002). These findings are of particular note because of the strong relationship between psychopathy and proactive aggression in other studies (Baughman, Dearing, Giammarco, & Vernon, 2012; Raine et al., 2006), providing some evidence that persons engage in trolling in order to achieve certain instrumental means.

While it may be difficult to determine the intent of someone's actions, at least one study has found that higher levels of self-reported intent to harm a victim was strongly predictive of engagement in traditional bullying in home and work contexts (Goldsmid & Howie, 2014). This finding suggests that intent may be a very important predictor variable for traditional bullying among postsecondary students. In conclusion, research to date suggests that intent to harm the victim may be an important definitional component of traditional and cyberbullying.

Distress associated with victimization. While Olweus's (1994, 2010) definitions do not explicitly state distress as a necessary component, other authors argue that an assumption exists that bullying causes distress in its victims (Goldsmid & Howie, 2014); indeed, research has borne out a strong association between bullying victimization and distress, including depression, anxiety, and suicide (Isolan, Salum, Osowski, Zottis, & Manfro, 2013; Kim & Leventhal, 2008; Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007; Schneider, O'Donnell, Stueve, & Coulter, 2012). Similar results have been found for cyberbullying: A recent systematic review provided evidence that cyberbullying victimization is associated with emotional stress, lower self-esteem, greater depressive symptomatology, higher levels of social anxiety, and higher levels of suicidal ideation and suicide attempts (Bottino, Bottino, Regina, Correia, & Ribeiro, 2015). In other words, both traditional bullying and cyberbullying research provide evidence that distress is associated with experiences of victimization, suggesting that distress may be a central definitional component to both forms of bullying. However, no studies have demonstrated a particular threshold that must be

met in order for an event to qualify as distressing. While some researchers have demonstrated that certain types of cyberbullying are more distressing than others (e.g., Pieschl, Kuhlmann, & Porsch, 2015, reviewed below), no set standard has been developed to assess distress. In addition, it is possible for an event to qualify as cyberbullying without the victim having to experience distress, further obfuscating the necessity of this criterion.

Without provocation. An overlooked aspect of Olweus's (1994) definition of bullying is that bullying often occurs without provocation on the part of the victim. This view concurs with the conceptualization of bullying as a form of proactive aggression (Salmivalli & Nieminen, 2002). Research has demonstrated that displays of aggression in typically-developing individuals is often the result of direct provocation (Raine et al., 2006; Reidy, Zeichner, & Seibert, 2011). While unprovoked aggression may be witnessed in many facets of life—for instance, as exhibited through random acts of violence—it is not a feature of typical behaviour, and may be indicative of psychopathology (Reidy et al., 2011). In other words, if typically-developed persons only engage in bullying behaviours due to provocation, then it may be logical to conclude that persons who cyberbully others may either be exhibiting psychopathological behaviour, or may be responding reactively due to provocation.

For this reason, it is important to examine the relationships between bullying, cyberbullying and reactive and proactive aggression. Many studies have demonstrated that a large percentage of cyberbullying victims are also cyberbullying perpetrators (Espelage et al., 2013; Gibb & Devereux, 2014; Kowalski et al., 2014; Tokunaga, 2010), suggesting that many victims may be responding to experiences of being cyberbullied by cyberbullying others back. For instance, Faucher and colleagues (2014) indicated that one of the main reasons students cyberbullied others is because the victims had cyberbullied the perpetrators first. Therefore, determining whether cyberbullying behaviours are reactive or proactive forms of aggression is of import to better understand its relation to bullying, which is generally conceptualized as proactive aggression (Goldsmid & Howie, 2014; Griffin & Gross, 2004; Salmivalli & Nieminen, 2002). As such, the criterion of provocation is worth studying to determine its role in instances of traditional bullying and cyberbullying.

Summary of traditional bullying criteria. In summary, research to date has not supported cyberbullying being a subset of traditional bullying through failing to establish that a power differential exists in cyberbullying. In addition, cyberbullying research has, for the most part, not assessed the intent of the perpetrator to cause harm to the target. However, the one study that has

assessed the perpetrator's intent (Gibb & Devereux, 2016) provides evidence that intent can be assessed within the realm of cyberbullying through utilizing a rating scale of the perpetrator's intended distress to the victim, and, therefore, can be linked back to traditional bullying criteria. Others, however, disagree, stating that intent should be assessed from the perspective of the perpetrator, while harm should be assessed from the perspective of the victim (Patchin & Hinduja, 2015; Vandebosch & Van Cleemput, 2008).

Other definitional concerns abound, including the fact that cyberbullying researchers cannot agree whether repetition over time is a necessary component for a behaviour to be classified as cyberbullying, arguing instead that the level of harm inflicted should be used as a defining feature to classify a behaviour as cyberbullying. However, researchers have been able to demonstrate that cyberbullying victimization causes distress in some victims, as assessed by correlations between victimization and checklists of psychopathology, suggesting that the criterion of distress is mutual in both bullying and cyberbullying. Finally, it is of import to determine whether cyberbullying behaviours are reactive or proactive forms of aggression, in order to better understand the relations between bullying and cyberbullying. Based on current research, however, sufficient evidence is not yet present to demonstrate that cyberbullying is in fact a subset of traditional bullying. This conclusion may be due to a lack of cyberbullying instruments that are designed based on the traditional bullying criteria. However, this conclusion may also be due to potential unique features of cyberbullying, which may differentiate cyber from traditional instances of bullying. We now turn our attention to these unique definitional components as a means to better understand the construct of cyberbullying.

Unique Definitional Components of Cyberbullying

In addition to the three bullying criteria (e.g., power differential, repetition over time, and intent to harm), several unique features of cyberbullying have been posited by other researchers, which include: the type of electronic media to bully; anonymity, and its association with online disinhibition; accessibility to the victim and a lack of supervision online; inability to escape the bullying; the amplification of harm due to the potentially large audience and the ability to distribute the message widely; and the publicity of the event (Berne et al., 2013; Mitchell, Jones, Turner, Shattuck, & Wolak, 2016; Pieschl, Kuhlmann, & Porsch, 2015; Sticca & Perren, 2013; Tokunaga, 2010). These unique features will be discussed in light of current available research.

The type of electronic media. It is interesting to note that researchers have found that

certain types of electronic media are more likely to be linked to cyberbullying incidents. In a large European study of cyberbullying, researchers found that medium—mobile phone and Internet use from a personal computer—were significant predictors of cyberbullying victimization; however, these mediums explained only a small percentage of the total variance between students who were cyberbullied (Genta et al., 2012). Earlier studies also found differences between the medium used and cyberbullying victimization (Dehue, Bolman, & Vollink, 2008; Raskauskas & Stoltz, 2007; Smith et al., 2008); however, technology and social media platforms have evolved considerably over the past eight years, leading to a convergence of platforms that can be accessed across multiple devices (Pieschl et al., 2015).

At least two studies have found that the medium used was associated with increased levels of distress. In a study of 138 German middle-school children ($M_{age} = 12.36$, $SD_{age} = 0.89$), participants rated video-based cyberbullying vignettes as more distressing than text-based cyberbullying vignettes, suggesting that the medium may differentially impact the distress associated with cyberbullying incidents (Pieschl, Porsch, Kahl, & Klockenbusch, 2013). A follow-up study also found that the type of medium—that is, pictorially-based media—were rated as significantly more distressing than text-based media in cyberbullying incidents (Pieschl et al., 2015). The distinction between text-based and video-based incidents of cyberbullying was also highlighted in a recent Canadian study, which found that participants identified with particular modes of cyberbullying (i.e., sending a nasty text, making a cruel video), rather than particular roles (i.e., bully, victim) in cyberbullying (Law, Shapka, Hymel, Olson, & Waterhouse, 2012). While the type of technology employed (e.g., cellphone, home computer) may not necessarily be a valid distinguishing feature of cyberbullying, these findings suggest that the medium used still matters, and may indicate a unique feature of cyberbullying.

Anonymity. Anonymity has been posited as a foundational aspect of cyberbullying (Berne et al., 2013; Tokunaga, 2010). However, this criterion has been challenged by many studies which have been unable to confirm the importance of this criterion. For example, in Mishna and colleagues' (2010) study, 68% of all cyberbullying incidents were perpetrated by persons known to the victim, including their friends (36%) and a student attending the victim's school (22%). Other studies and reviews have also demonstrated that anonymity is not always a major feature of cyberbullying (Kowalski et al., 2014; Nocentini et al., 2010). However, at least one study has found that secondary students have rated anonymous cyberbullying events as more distressing than events

where the target knew the perpetrator (Sticca & Perren, 2013). Therefore, while anonymity may not be a necessary condition of cyberbullying, anonymity does seem to exacerbate the level of harm experienced by the target. As well, anonymity seems to be foundational for other forms of online harassment. For instance, Rafferty and Vander Ven (2014) found that anonymity remained important among college students engaging in trolling. In addition, Simmons, Bauman, and Ives (2016) found that college fraternities and sororities often create anonymous Facebook pages that are used to denigrate other fraternities or sororities. These findings suggest that certain online behaviours may be more reliant on anonymous interactions with victims.

It is worth noting that anonymity may have been a more salient characteristic of cyberbullying in the early 2000s, as "first-wave" social media platforms, such as Bolt or Myspace, required users to create unique usernames. However, the rise of Facebook, a behemoth of over 1.5 billion users currently, changed this trend through requiring users to use their real names; note, however, that Facebook pages can still be created that shield the identity of the page creator. However, anonymity may still serve an adaptive function in specific types of cyberbullying behaviours; therefore, additional research is necessary to determine the importance of this factor in differentiating cyberbullying from traditional bullying.

Accessibility of the victim and a lack of supervision online. Another line of argument has stated that cyberbullying is differentiated from traditional bullying due to the accessibility of the target and a lack of supervision in online settings (Tokunaga, 2010). These two elements are closely related to a sociological theory which serves as an explanatory framework for crime. Specifically, Routine Activities Theory (RAT; Cohen & Felson, 1979) posits that crime occurs when a motivated offender can access a suitable target in the absence of capable guardians; however, the odds of a crime occurring decrease if any of the three criteria are absent (Cohen & Felson, 1979). Components of RAT have been successfully applied as an explanatory framework for cyberbullying occurrences (Marcum, Higgins, & Ricketts, 2010; J. N. Navarro & Jasinski, 2012, 2013). For instance, one study found being online (i.e., accessibility; OR = 1.33, $p < .001$) and utilizing certain technologies, such as instant messaging (i.e., suitable target; OR = 3.66, $p < .001$) increased the odds of being cyberbullied; however, when parents utilized a website filter (i.e., capable guardians; OR = .77, $p < .05$), the odds of being cyberbullied decreased (J. N. Navarro & Jasinski, 2012).

However, other studies have failed to provide evidence for at least one of the three RAT components. Navarro and Jasinski (2013) found that suitability—evidenced through use of online

chat rooms (OR = 3.12, $p < .001$) and blogs (OR = 1.83, $p < .001$)—but not availability (OR = 1.0, p = n.s.) or guardianship (OR = 0.76, p = n.s.) predicted cyberbullying victimization. That is, time spent online may or may not increase one's risk of being cyberbullied, and may be dependent upon the types of activities or media that one uses. For instance, a recent study of 4,531 Korean adolescents (ages 11 to 14) found that problematic Internet use (i.e., Internet addiction) was associated with higher likelihoods of being a cyberbullying victim (OR = 2.36, $p < .001$), perpetrator (OR = 1.66, $p = .01$), or victim-perpetrator (OR = 2.38, $p < .001$; Jung et al., 2014), providing evidence that Internet usage *per se* is not necessarily predictive of cyberbullying—that is, it is possible to use the Internet without being abused by it. However, other studies have found that a combination of risky online activities (such as trying to meet new people [OR = 1.18, $p < .05$]), using certain media (such as instant messaging [OR = 1.12, $p < .05$] and chatrooms [OR = 1.23, $p < .01$]), and the amount of time spent online (OR = 1.21, $p < .01$) increased cyberbullying victimization, while parental monitoring strategies (such as jointly creating Internet usage rules or supervising the installation of different software) were significantly related to decreases in cyberbullying victimization (OR = .28, $p < .01$; R. Navarro et al., 2013), indicating that both quantity and type of Internet usage may be related to cyberbullying. This study provides additional evidence that the utility of the concept of guardianship may be a protective factor to cyberbullying victimization among adolescents; however, it is unclear whether this form of guardianship would be protective for postsecondary students—many who are the age of majority and, therefore, legally competent to care for themselves.

Of note has been the finding that adolescents who have computers in their bedrooms are more likely to be cyberbullying victims (Genta et al., 2012); guardianship, therefore, could also include removing oneself from the proximity of electronic technologies. Therefore, it is imperative to consider other forms of guardianship that may be more applicable to postsecondary students. In sum, mixed results have been found for the importance of accessibility and online supervision for cyberbullying victimization; however, results suggest that these may be promising avenues to explore, especially among adolescent youth who are still under the care of others.

Amplification of harm. The fourth unique aspect of cyberbullying is the concept of the amplification of harm due to the online context. There are several facets through which harm could potentially be amplified, including the public nature of cyberbullying events, the large audience, and the ability to harass a victim in any time and any place (Berne et al., 2013; Mitchell et al., 2016;

Pieschl et al., 2015; Sticca & Perren, 2013). Due to the potentially pervasive nature of cyberbullying, this form of bullying has received significant attention from parents, educators, and policymakers, with the number of cyberbullying interventions proliferating in recent years (Bosworth & Judkins, 2014; Cross & Barnes, 2014; Salmivalli, 2014; Yoon & Bauman, 2014)— despite the fact that verbal and social bullying are more common occurrences than physical or cyberbullying (Hymel & Swearer, 2015). However, whether cyberbullying does in fact amplify harm has been more difficult to establish within the literature.

A telephone survey of 791 youths aged 10 to 17 years found that, over the year preceding the study, 34% of the sample reported being harassed by peers (Mitchell et al., 2016). Participants who reported being harassed via technology were then asked about technological factors that could amplify harm, including the number of witnesses, whether the target felt that they could stop what was happening, and whether the target felt that they could get away or remove themselves from the situation quickly. Results indicated that 13% of targets harassed online only had a significant number of witnesses (51 or more); however, 69% of targets felt that they could stop what was happening while 81% felt that they could remove themselves quickly from the situation. When examining the emotional impact of harassment, youth who had only been harassed via technology were significantly less likely to report feeling upset, afraid, or unsafe, and had significantly lower mean emotional impact scores ($M = 15.3$, $SD = 0.9$) than participants harassed in-person ($M = 19.1$, $SD = 1.7$) or both online and in-person ($M = 23.1$, $SD = 1.2$). This study suggests that youth were able to stop events of online harassment, providing evidence of a high level of agency among certain cyberbullying victims. In addition, while technology-only events had a significantly greater audience, this feature did not seem to amplify harm for targets.

However, not all studies agree about the factors that are most associated with amplified harm. A recent three-study examination of the role of differential factors and distress levels in cyberbullying incidents found that, across all three studies, the publicity of the event was associated with greater levels of self-reported distress among middle school, high school, and young adult participants (Pieschl et al., 2015). Another study, in which Swiss middle school children ($M_{age} =$ 13.7) rated cyberbullying vignettes, found that public cyberbullying scenarios were rated as more distressing than private cyberbullying scenarios, suggesting that students attribute greater emotional distress to the potentially public nature of cyberbullying (Sticca & Perren, 2013). These mixed results provide an opportunity for additional research to determine whether publicity is a unique

feature of cyberbullying that differentiates this behaviour from traditional bullying.

Summary of potential unique components of cyberbullying. In summary, several unique features have been posited that may further differentiate cyberbullying from traditional bullying, including anonymity, the type of electronic medium used, the accessibility of the victim, and the amplification of harm. As with the definitional components of traditional bullying, studies have demonstrated mixed results in establishing the utility of these unique features. However, the type of medium used (i.e., text or pictorial), and the type of online behaviours engaged in (e.g., problematic Internet use) may serve as useful dimensions to further distinguish cyberbullying from bullying. In addition to establishing useful definitional components, reliance on theory to guide conceptualization and intervention in cyberbullying cases is also necessary. We now turn our attention to examining candidat theories to better understand cyberbullying.

Theoretical Approaches to Understanding Cyberbullying

While the field has remained largely atheoretical, recent advances have been made in terms of using explanatory frameworks to understand the phenomenon of cyberbullying. Explanatory frameworks are necessary in order to develop targeted interventions, provide an explanatory framework for how and why an intervention works, and determine factors that predict intervention success or failure (Nilsen, 2015). Explanatory frameworks to date have included RAT, the social-ecological model, the General Aggression Model, and the I^3 Model.

Routine Activities Theory. As discussed earlier, elements of RAT—the concepts of accessibility and a suitable target—have been demonstrated in select studies; however, no study has provided consistent evidence for the utility of this approach in understanding all instances of cyberbullying. In addition, the concept of capable guardians may not be applicable to university students, who are legally considered adults. While the parsimony of this theory is appealing, the evidence base for its utility to cyberbullying is sparse, making it an inappropriate candidate for evaluating cyberbullying.

Social-ecological model. One of the more popular theoretical frameworks for cyberbullying is the social-ecological model, an application of Bronfenbrenner's (1979) social ecological theory to bullying interactions, which postulates that bullying "is not just the result of individual characteristics, but is influenced by multiple relationships with peers, families, teachers, neighbors, and interactions with societal influences (e.g., media, technology)" (Swearer & Hymel, 2015, p. 344). This theory has been successfully applied by others to traditional bullying as well as

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cyberbullying (Cross et al., 2015; Espelage, 2014; Espelage, Rao, & de la Rue, 2013; Espelage & Swearer, 2010; Swearer & Espelage, 2004), demonstrating the utility of this framework. For instance, Cross and colleagues (2015) postulated that the interactions between individual-level (lack of empathic responsiveness to victims, moral disengagement, pro-bullying attitudes, poor problem-solving skills, traditional bullying perpetration and victimization), family-level (parental monitoring of online behaviours, parental understanding of online environments, parent-child relationships), peer-level (friends who cyberbully or have beliefs that support cyberbullying, normative expectations/social norms of cyberbullying, involvement in other problem behaviours [e.g., substance use, carrying weapons, cruelty to animals], school climate), online level (access/frequent use/dependence on technology, diminished censorship due to anonymity, heightened anticipation of causing harm), and community-level (transition from elementary to high school, lack of awareness of cyberbullying laws) impacted the extent of youths' cyberbullying involvement.

One cogent critique of social-ecological theory as applied to the field of environmental studies is that it fails "to recognize that essential differences in behavior, processes, and structures exist between social systems and ecological systems" (Armitage, Béné, Charles, Johnson, & Allison, 2012, p. 17); this in turn fails to capture the role of human agency in particular outcomes (Stojanovic et al., 2016). The same critique holds for the field of cyberbullying: While social-ecological theory places emphasis on individual-level factors in cyberbullying instances, attention is also diverted on the role of the larger systems (e.g., family, school, communities) that sustain or influence this behaviour. While this focus is not without merit, it fails to capture the here-and-now of the cyberbullying interaction and the roles played by perpetrators, victims, and bystanders. In addition, focusing on systems—many of which are intractable—downplays individual volition and the ability of the individuals involved to change or adapt (Stojanovic et al., 2016), and may therefore decrease the utility of certain interventions aimed at addressing systemic factors. This is not to say that the social-ecological model is without merit or utility; however, if our interest lies in understanding the *relationship* between cyberbullying perpetrator and victim, a lens focused on the microcosm of the relationship may be more useful.

General Aggression Model. The General Aggression Model (GAM; Anderson & Bushman, 2002; Anderson & Huesmann, 2003) has been utilized in many studies of aggression, and has recently been introduced to the cyberbullying world through the work of Kowalski and colleagues (2014). GAM posits that any aggressive act should be evaluated based on the degree of hostility

present, the automaticity of the actions, whether the main intent is to harm the victim or benefit the perpetrator, and the level of reflection on possible consequences of aggressive actions (DeWall & Anderson, 2011). Furthermore, this model also examines the cognitive factors within the aggressing individual, including their interpretations of their environment, their expectations regarding particular outcomes, their knowledge and beliefs about how a person acts in a particular situation (i.e., cognitive scripts), and how much agency or ability to respond the individual has (DeWall & Anderson, 2011). Finally, this theory consists of three inputs that contribute to the overall aggressive event: personal and situational inputs; inputs related to cognitions, affect, and arousal; and inputs arising from situational appraisals and decisions (Anderson & Bushman, 2002; DeWall & Anderson, 2011; Kowalski et al., 2014). The combination between environmental, situational, and cognitive factors has allowed GAM to maintain a prominent place in aggression research for many years (Allen, Anderson, & Bushman, 2018).

In their recent meta-analysis, Kowalski and colleagues (2014) propose GAM as the most suitable model for studying cyberbullying due to its three areas of inputs, arguing that GAM best accounts for personal and situational factors accounting for both cyberbullying victimization and perpetration. However, scholars critical of GAM have demonstrated that previous research conducted using this model focus almost entirely on cognitive factors, with little evidence of its sensitivity to situational or personal inputs (Ferguson & Dyck, 2012). Even the creators of GAM have conceded their theory has remained largely a social-cognitive script theory (Anderson & Bushman, 2002; Ferguson & Dyck, 2012). Moreover, Ferguson and Dyck (2012) argue that GAM is built on certain assumptions that impede the study of aggression, namely, that all aggression is bad; that aggression is mainly learned; and that aggression is largely a cognitive process.

In terms of current knowledge regarding aggression, studies have demonstrated that aggression is a natural response to threat (think here of the distinction between reactive and proactive aggression), with this response existing on a continuum of adaptive and maladaptive behaviour (Hawley & Vaughn, 2003; Smith, 2007). Aggression, therefore, is not implicitly "bad," and in many cases, is very adaptive to human survival. In addition, while social learning factors may play a role in aggression (and may reinforce the rewards related to aggression), not all aggression stems from reinforcement or learning processes, with many studies providing evidence of genetic and biological factors associated with aggression (Beaver, 2010; Carré, McKormick, & Hariri, 2011; Rhee & Waldman, 2002). Finally, aggression is not mainly a cognitive process, as evidenced by the

fact that some people respond aggressively due to goal obstruction (i.e., reactive aggression), while others aggress to achieve a particular goal (i.e., proactive aggression). Ferguson and Dyck (2012) argue that GAM's conceptualization of aggression is that it is an automatic and impulsive response, thereby precluding it from forms of aggression relying on higher-order cognition. It is easy to see how these theoretical shortcomings reduce GAM's utility in explaining cyberbullying, especially subtypes that include premeditation (such as impersonation, hacking, or trolling), and in providing a useful framework for affective motivations (including jealousy and revenge) that comprise certain acts of cyberbullying victimization and perpetration. That GAM has received little attention so far in the cyberbullying literature may indicate that other scholars also see its lack of theoretical applicability to bullying and cyberbullying.

$\mathbf{I^3}$ **Model.** I^3 model ("I-cubed-model"; Finkel, 2014) is a process-oriented metatheory which specifies how a non-aggressive interaction can become aggressive (Slotter & Finkel, 2011). Based on I^3 theory (Slotter & Finkel, 2011), this newly-expanded metatheory seeks to serve as a unifying framework for predicting behaviour in general (Finkel, 2014). The I^3 Model is based on three interrelated processes that influence aggressive behaviour: instigating triggers, impelling forces, and inhibiting forces (Slotter & Finkel, 2011). Instigating triggers refer to contextual, behaviour-promoting forces that increase the likelihood of an aggressive response (Finkel, 2014). Put differently, "instigation encompasses the effects of exposure to a particular target object in a particular context that normatively affords a certain behaviour" (Finkel, 2014, p. 11); that is, certain contexts afford an individual with certain responses to that context. Instigating triggers are further divided into dyadic—having to do with the relationship between the aggressor and victim—or third-party—associated with someone other than the victim—triggers. Slotter and Finkel (2011) suggest that direct provocation, social rejection, and goal obstruction can all serve as instigating triggers that increase the likelihood of aggressive behaviour.

Impelling forces refer to the "situational or stable factors that determine the likelihood a person will experience a proclivity to enact the afforded behaviour when encountering that target object in that context" (Finkel, 2014, p. 12). That is, impelling forces mediate the strength of the aggressive response in the presence of a proclivity to enact the response through influencing the psychological state of the individual experiencing the instigator (Finkel, 2014; Slotter & Finkel, 2011). For instance, research demonstrates that personality traits are related to aggressive responding. In a study of 126 university students (M_{age} = 21.24 years), researchers found that

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students with lower scores on the Big Five personality factor of conscientiousness were more likely than students with scores of conscientiousness to respond aggressively after receiving negative feedback from a peer (Jensen-Campbell, Knack, Waldrip, & Campbell, 2007). This example provides evidence of how personality traits (e.g., a dispositional impellor) mediate aggressive behaviour in the face of negative peer evaluations (e.g., a dyadic instigator).

Inhibiting forces refer to factors that decrease or inhibit the likelihood or intensity of an aggressive response (Slotter & Finkel, 2011). An example of an inhibiting force is the presence of empathy for the target. In a study of 318 Italian adolescents, a significant negative correlation was found between measures of bullying behaviour and empathic concern ($r = -.28$, $p < .001$) and perspective taking ($r = -.19$, $p < .01$); however, this relationship held mainly for boys (Gini, Albiero, Benelli, & Altoè, 2007). Both impelling and inhibiting forces stem from situational or stable factors, which may include evolutionary or cultural adaptations, personal attributes of the offender, dyadic factors, or situational factors (Slotter & Finkel, 2011). Figure 2-2 illustrates proposed contributors for each of the triggers and forces, and demonstrates the wide range of situational, personal, and societal factors that can contribute to an aggressive interaction.

It is important to note that I[3] Model is a metatheory, a set of foundational assumptions that provide a starting point for the development of research questions and the testing of theories (Finkel, 2014). Phrased differently, a metatheory is a "higher order theory about theories, allowing one to analyze, compare, and evaluate competing bodies of ideas" (American Psychological Association [APA], 2014, p. 213). All metatheories are derived from certain foundational assumptions or theoretical commitments (APA, 2014; Finkel, 2014). In the case of I[3] Model, a foundational assumption is that the interaction between inhibition, impellance, and instigation predicts the likelihood of some target behaviour. As metatheories serve as a framework for the generation of research, the metatheory requires derivative theories to test these underlying assumptions. Finkel (2014) posits Perfect Storm Theory, a theory that predicts that behaviour is most likely to be enacted when impelling forces and instigating triggers are strong and inhibiting forces are weak. There are various pathways which could lead to an aggressive interaction; thus, all three forces do not necessarily have to be activated for an interaction to become aggressive (see Finkel, 2014, for 12 possible pathways to aggression). However, Perfect Storm Theory provides a most likely candidate for most aggressive behaviours, and presents with face validity for cyberbullying interactions. Two studies to date have utilized I[3] Model as a candidate explanatory framework for cyberbullying.

Wong, Cheung, Xiao, and Chan (2015) conducted a study on 211 university students (females: 56.9%) to determine whether cyberbullying victimization (instigating trigger), perceived online disinhibition (impelling force), and subjective norms (inhibiting force) predicted cyberbullying perpetration, using gender as a moderator. Participants completed an online survey, with cyberbullying victimization being assessed over the preceding 12-month period by six questions targeting harassment, social exclusion, outing, and impersonation. Results indicated the utility of the I^3 Model through demonstrating relationships in the expected directions for each of the forces (cyberbullying victimization: $\beta = 0.58$, $p < .01$; perceived online disinhibition: $\beta = 0.14$, $p < .01$; subjective norms: $\beta = -0.17$, $p < .01$), and accounted for 49% of the variance in cyberbullying perpetration. In addition, gender differences were found, suggesting that instigating triggers were stronger contributors to cyberbullying for males ($\beta = 0.61$, $p < .01$) than for females ($\beta = 0.56$, $p < .01$). Alternatively, impelling forces were stronger contributors to cyberbullying perpetration for females ($\beta = 0.20$, $p < .01$) than for males ($\beta = 0.09$, $p < .01$). Also, the effect of impelling forces (i.e., online disinhibition) were stronger for females ($\beta = -0.19$, $p < .05$) than for males ($\beta = -0.18$, $p < .01$); however, the differences were marginal. This study provided evidence for Perfect Storm Theory as applied to cyberbullying victimization.

In a recent qualitative study, Myburgh, Andrie, and Hellsten (2015), examined secondary students' reasons for cyberbullying through the lens of I^3 Model. Relying on archival thematic analysis, survey data from 333 Grade 11 and 12 students ($M_{age} = 16.71$, $SD_{age} = .56$) were analyzed for evidence of instigating triggers, impelling forces, and inhibiting forces. Students' responses were grouped into three main themes of reasons for cyberbullying perpetration: situational, social-relational, and offender-based. Results provided evidence for instigating and impelling forces, but no evidence was found for inhibiting forces[5] as reasons why people cyberbully others. Specifically, offender-based reasons for cyberbullying were most often classified as impelling forces, and included elements such as the offender's internal state (e.g., personality and mental health variables), and factors such as a lack of control over their own lives and the desire to wield power and control over others. Situational factors (such as online deindividuation) and social-relational factors (including the pre-existing relationship between the victim and offender, as well as the offender and important others) were classified as both instigating triggers and impelling forces, suggesting some

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[5] This was expected, because the data being analyzed were respondents' answers to the question: "Why do you think people cyberbully others?"

Instigating Triggers

- *Dyadic*
  - Direct provocation
  - Goal obstruction
  - Social rejection
- *Third-party*
  - Direct provocation
  - Goal obstruction
  - Social rejection
  - More acceptable or desirable target

Impelling Forces

- *Evolutionary or cultural*
  - Adaptations
  - Social norms
- *Personal*
  - Dispositional hostility
  - Narcissism
  - Testosterone
- *Dyadic*
  - Power differential
  - Jealousy
  - Insecure relationship
- *Situational*
  - Uncomfortable temperatures
  - Physical pain
  - Violent media

Inhibiting Forces

- *Evolutionary or cultural*
  - Adaptations
  - Social norms
- *Personal*
  - Dispositional hostility
  - Narcissism
  - Testosterone
- *Dyadic*
  - Power differential
  - Jealousy
  - Insecure relationship
- *Situational*
  - Uncomfortable temperatures
  - Physical pain
  - Violent media

Adapted from Slotter and Finkel (2011).

Figure 2-2. Candidate triggers and forces in the I[3] Model.

overlap between the reasons for cyberbullying and their subsequent classification according to the I^3 Model. While this study had several limitations, including a small and geographically-bound sample size, as well as reliance on archival data, it did demonstrate the utility of the I^3 Model for conceptualizing cyberbullying instances.

Summary of theoretical frameworks. While several theoretical frameworks have been posited for the study of cyberbullying, few have demonstrated consistent fit with the outcomes associated with cyberbullying. Four theories were selected for critique, due to either their prominence or potential for application to the phenomenon of cyberbullying: RAT, social-ecological theory, GAM, and I^3 Model. While RAT contains useful heuristics, this theory has not provided consistent evidence for at least one of its three components across several studies. Studies utilizing social-ecological theory have demonstrated utility for cyberbullying; however, the focus on larger systems may divert attention away from the interaction between a cyberbullying perpetrator and victim. Scholars have argued for the use of GAM as a candidate theoretical framework for cyberbullying; however, certain basic assumptions to this model, in addition to its lack of focus on situational or environmental variables, makes it less than ideal for cyberbullying instances. I^3 Model, and more specifically Perfect Storm Theory, was posited as a candidate theoretical framework in order to examine how an interaction becomes aggressive, and provides a parsimonious, testable model to examine its utility for studying cyberbullying.

Summary of Gaps Within the Literature

Despite the fact that research has proliferated within this area, approaches to understanding cyberbullying remain largely atheoretical (Berne et al., 2013; Espelage et al., 2013; Tokunaga, 2010). While cyberbullying was defined within the context of the traditional bullying literature—and is therefore steeped in the theoretical underpinnings of face-to-face peer aggression—data-driven definitions are a necessary component in order to refine our understanding of this pressing societal concern (Pieschl et al., 2015). By studying the definitional components of bullying and cyberbullying, researchers will be better able to define and operationalize future studies of this phenomenon (Bauman et al., 2013). In turn, this allows for the testing of theoretical frameworks and targeted interventions (Craig et al., 2008; French et al., 2012).

As this review of the literature has demonstrated, unsatisfactory evidence has been presented to state definitively that cyberbullying is a subset of traditional bullying. In addition, several potentially unique features of cyberbullying have been identified, but research has failed

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to consistently bear out that these unique features are central to the construct of cyberbullying. In order to address these deficits, it is important to test these definitional components in order to improve the measurement of cyberbullying. It is also of import to establish the concurrent validity of bullying and cyberbullying measures through demonstrating a significant relationship between these constructs to the overarching construct of aggression, to which they are posited to belong. Finally, the scholarly literature revealed a dearth of information associated with cyberbullying among postsecondary students, especially in Canada. While a growing literature exists regarding cyberbullying among primary and secondary school children, very few studies have examined this phenomenon among postsecondary students.

The proposed study seeks to examine the occurrence of bullying and cyberbullying among a sample of postsecondary students in Saskatchewan, Canada using a cross-sectional design relying on survey methodology. Specifically, questionnaires examining the relationships between proactive and reactive aggression, bullying, and cyberbullying will be used to establish the relationships between these three constructs. The definitional features of bullying and cyberbullying will be examined to determine their utility in predicting cyberbullying victimization and perpetration. Finally, a novel theoretical framework, the I^3 Model—and more specifically, Perfect Storm Theory—will be tested to determine its utility in understanding instances of cyberbullying. Chapter Three will examine the proposed methodology for this study.

Chapter Three: Methodology

This chapter reviews the methodology of the current study, through defining the specific research questions, stating the research design and associated hypotheses, identifying the inclusion and exclusion criteria for participation, describing and critiquing the relevant measures, and outlining the procedure. Specifically, the current study sought to utilize a cross-sectional design to test relationships between the constructs of proactive and reactive aggression, bullying, and cyberbullying, while also seeking to determine whether the definitional criteria of bullying and cyberbullying were met via self-report measures. In addition, this study sought to examine the utility of the I^3 Model as a theoretical framework for cyberbullying occurrences. Throughout this chapter, ethical challenges were identified and the strategies used for minimizing harm and maximizing benefit to participants described.

Research Questions

Based on the review of the extant literature, several research questions served as the basis of inquiry for the current study:

1) What are the most common types of bullying and cyberbullying behaviours among postsecondary students in Saskatchewan?

2) How common is bullying and cyberbullying among postsecondary students in Saskatchewan, and are there specific gender differences?

3) Does the inverted-U hypothesis—that cyberbullying behaviours increase during middle school years and tapers off in high school and beyond—hold true based on the rates of cyberbullying victimization and perpetration reported among postsecondary students?

4) Is cyberbullying a unique subset of traditional bullying and proactive aggression, as evidenced by a moderate to strong relationship between these three constructs?

5) Does cyberbullying meet the definitional threshold of traditional bullying, as evidenced by the presence of repetition of the bullying behaviours, the intent to harm the victim, and the presence of a power differential between victim and perpetrator, and is this relationship evident among postsecondary students?

6) Are the unique aspects of cyberbullying—anonymity, how public the event is, amplification of harm, and victimization without provocation—unique contributors that differentiate cyberbullying from traditional bullying?

7) Does I^3 Model provide an explanatory framework for instances of cyberbullying victimization and perpetration? Specifically, is there evidence for instigating (high levels

of Internet addiction), impelling (high levels of self-rated proactive aggression), and inhibiting (high levels of subjective wellbeing [SWB]) forces for cyberbullying victimization and perpetration within a postsecondary sample?

Research Design and Hypotheses

The current study sought to expand the knowledge base of cyberbullying behaviour among postsecondary students through utilizing a cross-sectional survey to gather information regarding the experiences of cyberbullying perpetration and victimization among postsecondary students. In addition, this study sought to examine the relationship between proactive and reactive aggression, bullying, and cyberbullying, through administering measures of each in order to determine whether cyberbullying is a distinct entity from traditional bullying and/or aggression. As well, this study sought to test the importance of the definitional components of cyberbullying by asking students to identify which definitional components are most important in their experience of cyberbullying. Finally, I^3 Model was evaluated for its utility in understanding cyberbullying. Based on the research questions, several hypotheses were postulated:

Hypothesis 1: Based on current literature, it was expected that cyberbullying would be a common occurrence among postsecondary students, evidenced by high occurrence rates (> 10%) for perpetration and victimization within the past year. Specifically, flaming, harassment, and denigration were hypothesized to be the most common types of cyberbullying behaviours reported among victims and perpetrators, while impersonation and outing and trickery were hypothesized to be less common among both these groups. Finally, females were expected to report greater levels of cyberbullying victimization as compared to males.

Hypothesis 2: Stemming from the first hypothesis, it was hypothesized that evidence would not be found in favour of the inverted-U hypothesis of cyberbullying, based on high rates of cyberbullying occurrences.

Hypothesis 3: It was hypothesized that females would be more likely to report higher rates of traditional bullying victimization than males. In keeping with developmental trajectories of bullying (Naylor, 2011), it was expected that verbal and social aggression would be the most common forms of traditional bullying, while physical aggression would be least common. However, gender differences were expected: Males were expected to be more likely to engage in physical aggression, whereas females were expected to be more likely to engage in direct and indirect social aggression.

Hypothesis 4: It was expected that cyberbullying would not be a unique construct separate from proactive aggression and bullying, as evidenced by moderate ($r \geq .30$) to large ($r \geq .50$) correlations between these constructs.[6]

Hypothesis 5: It was expected that cyberbullying would not meet the definitional threshold for traditional bullying, as evidenced through modelling the differential impacts of repetition, imbalance of power, and intent to harm on the outcome of cyberbullying victimization. Specifically, it was expected that repetition and intent, but not a power differential, would be significant predictors for the outcome of cyberbullying victimization. Similarly, it was expected that repetition and intent, but not a power differential, would be significant predictors for the outcome of cyberbullying perpetration. This hypothesis was tested via hierarchical multiple regression, where the outcome variables were participants' self-reported cyberbullying victimization (CDBQ–V total score) and perpetration (CDBQ–P total score) scores.

Hypothesis 6: In order to test whether the unique features of cyberbullying were predictive of cyberbullying behaviour, a multiple hierarchical regression was conducted to test the influence of anonymity, publicity of the event, perceived victim distress, and whether the event occurred without provocation, on the outcome variables of participants' self-reported cyberbullying victimization (CDBQ–V total score) and perpetration (CDBQ–P total score) scores.

Hypothesis 7: It was hypothesized that evidence would be found for the utility of the I^3 Model as an explanatory framework for cyberbullying occurrences among university students. Moderation analyses, using gender as a moderator, were employed to test the relationships between instigating (high levels of Internet addiction), impelling (high levels of self-rated proactive aggression), and inhibiting (high levels of SWB) forces on cyberbullying victimization and perpetration.

Participants

The current study recruited students attending the University of Saskatchewan during the intersession semester of the 2016–2017 school year. This study was reviewed on ethical grounds and approved by the Behavioural Research Ethics Board of the University of Saskatchewan. In total, 423 persons completed at least 50% of the current study. Of this number, 25 students

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[6] Based on Cohen's (1988) criteria for effect sizes.

participated from postsecondary institutions other than the University of Saskatchewan. However, due to small cell sizes, these participants' data were excluded from subsequent analyses. Thus, the sample used for analysis comprised 398 participants from the University of Saskatchewan.

Questionnaires were excluded casewise from analysis if they were more than 50% incomplete overall and more than 50% incomplete in any one section, consistent with the guidelines established by the U. S. Department of Health and Human Services, Agency for Healthcare Research and Quality (2004). While statistical modelling for imputation of missing data is becoming popular (Cole, 2008; Osborne, 2013), the author has not received training in this area. Therefore, to ensure statistical procedural clarity, and to reduce statistical errors, casewise deletion was utilized when criteria above were not met and pairwise deletion was utilized when participants were missing one or two items within a scale.

Participants (M_{age} = 23.70, 95% CI [23.22, 24.18], SD_{age} = 4.83, range: 18 – 49) were predominantly female (67.59%), Caucasian (65.83%), and pursuing a bachelor (75.81%) degree. The majority of participants reported being born in Canada (74.87%). Most participants identified as either primarily (16.83%) or exclusively heterosexual (64.32%), with most being in a relationship (34.67%) or single and not dating (32.91%). From a religious perspective, most participants identified as Christian (36.68%), atheist (18.59%), or agnostic (17.08%). Over half of the sample (50.75%) indicated using social media platforms several times per day, with Facebook (54.18%) and Snapchat (21.78%) being the most common applications used. Please see Table 3-1 for full descriptive sample characteristics.

A sample size estimate, using Raosoft's (2017) online sample size calculator, was completed prior to the commencement of recruitment. As previously noted, Faucher et al. (2014) reported a cyberbullying victimization rate of 24.1% among university students. Enrollment data for the 2016–2017 fall term indicated that 21,411 students were enrolled (University of Saskatchewan Data Warehouse, 2017). Using the total number of students as the sample size,[7] with a response distribution of 24.1%, a 5% margin of error, and 95% confidence intervals, the estimated sample size for sufficient power was 278 participants.

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[7] While survey recruitment occurred only during the spring term of 2017, the use of purposive sampling made it likely that students not currently taking a class could respond to the survey. In addition, university-wide registration occurred during this time period, increasing the odds that students not currently enrolled could have responded to the survey. Therefore, it was decided to use the largest sample size in order to allow for these possibilities.

Table 3-1. *Participant Descriptive Statistics.*

	Total[8] (N = 398)		Males (n = 120)		Females (n = 269)	
	n	*%*	*n*	*%*	*n*	*%*
Degree Level						
Bachelor	301	75.82	85	71.43	207	76.95
Master	51	12.85	16	13.45	35	13.01
Doctorate	28	7.05	12	10.08	16	5.95
Other	17	4.28	6	5.04	11	4.08
Born in Canada						
Yes	298	74.87	83	69.17	208	77.32
No	100	25.13	37	30.83	61	2.68
Ethnicity						
Aboriginal	22	5.53	7	5.83	14	5.20
Black	11	2.76	2	1.67	9	3.35
East Asian	22	5.53	8	6.67	13	4.83
South Asian	38	9.55	15	12.50	22	8.18
Southeast Asian	14	3.52	3	2.50	11	4.09
West Asian	9	2.26	6	5.00	3	1.12
Latin American	9	2.26	1	0.83	8	2.97
White/Caucasian	262	65.83	77	64.17	179	66.54
Other	11	2.76	1	0.83	10	3.72
Relationship Status						
Single (dating)	80	20.10	32	26.67	44	16.36
Single (not dating)	131	32.91	36	30.00	92	34.20
In a relationship	138	34.68	35	29.17	101	37.55
Common-law/married	48	12.06	17	14.17	31	11.52
Divorced	1	0.25	0	0.00	1	0.37
Religious Orientation						
Agnostic	68	17.09	23	19.17	42	15.61
Atheist	74	18.59	32	26.67	41	15.24
Buddhist	8	2.01	1	0.83	6	2.23
Christian	146	36.68	34	28.33	111	41.26
Hindu	10	2.51	6	5.00	4	1.49
Jewish	5	1.26	1	0.83	4	1.49
Muslim	27	6.78	9	7.50	18	6.69
Other	60	15.08	14	11.67	43	15.99
Sexual Orientation						
Exclusively gay/lesbian	9	2.26	3	2.50	5	1.86
Primarily gay/lesbian	4	1.01	1	0.83	1	0.37
More gay/lesbian than heterosexual	1	0.25	0	0.00	1	0.37

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[8] Note that a small number (*n* = 7) participants identified as a gender other than male or female. However, due to their small cell size, these participants were excluded from analysis as a separate category but were retained in total group analyses.

Bisexual	18	4.52	2	1.67	16	5.95
More heterosexual than gay/lesbian	13	3.27	1	0.83	12	4.46
Primarily heterosexual	67	16.83	18	15.00	49	18.22
Exclusively heterosexual	256	64.32	84	70.00	170	63.20
Queer	10	2.51	1	0.83	5	1.86
Other	20	5.03	10	8.33	10	3.72
Social Media Use						
Several times a day	202	50.75	53	44.17	142	52.79
A few times a day	79	19.85	23	19.17	54	20.07
Once or twice a day	38	9.55	16	13.33	22	8.18
A few times a week	46	11.56	17	14.17	29	10.78
Once or twice a week	12	3.02	2	1.67	10	3.72
A few times a month	13	3.27	5	4.17	8	2.97
Once or twice a month	4	1.01	1	0.83	3	1.12
A few times a year	4	1.01	3	2.50	1	0.37
Preferred SM Platform						
Facebook	214	54.18	64	54.24	146	54.48
Instagram	16	4.05	3	2.54	13	4.85
Snapchat	86	21.77	16	13.56	69	25.75
Twitter	7	1.77	2	1.69	4	1.49
WhatsApp	12	3.04	9	7.63	3	1.12
Other	60	15.19	24	20.34	33	12.31

Notes. Percentages may not add up to 100% due to rounding. SM = social media.

Materials and Measures

Demographics questionnaire. Participants responded to 16 basic demographic variables of interest, including the year in which they were born, postsecondary institution name, years of postsecondary education, ethnicity, gender, sexual orientation, relationship status, and religious orientation. Note that many of these variables were selected because of their demonstrated link with instances of cyberbullying perpetration and victimization (Hinduja & Patchin, 2011). Please see Appendix D for the full list of questions.

Technology use questionnaire. Participants completed four questions related to their technology use, including the type of social media platform used most often to communicate with their friends, their frequency of social media use, and the types of social media platforms used within the past year. Please refer to Appendix E for the full list of questions.

Aggression measure. The Reactive-Proactive Aggression Questionnaire (RPQ; Raine et al., 2006) is a 23-item self-report measure that assesses a participant's levels of reactive (12 items) and proactive (11 items) aggression. While initially developed for use with children and adolescents, subsequent studies (Brugman et al., 2016) have provided evidence of psychometric

properties for use with adult populations. Participants respond to questions which assess reactive (e.g., "Yelled at others when they have annoyed you?") and proactive (e.g., "Had fights with others to show who was on top") aggressive behaviours using a three-point rating scale that ranges from 0 (*never*) to 2 (*often*). Scores can be summed into reactive, proactive, and total aggression scales. Higher scale scores indicate greater levels of aggression.

Evidence for the reliability and validity of this instrument has been reported by others (Brugman et al., 2016; Fite, Raine, Stouthamer-Loeber, Loeber, & Pardini, 2009). A recent study found acceptable internal consistency for the reactive ($\alpha = .84$) and proactive ($\alpha = .85$) aggression scales, while exploratory factor analysis replicated the original two-factor scale solution (Brugman et al., 2016). For the current study, this instrument demonstrated acceptable internal consistency for both the reactive ($\alpha = .77$) and proactive ($\alpha = .76$) scales, based on the criteria set forth by George and Mallery (2003).[9] Please refer to Appendix F for the full version of this measure.

Cyberbullying measure. The Cyberbullying Definitions and Behaviours Questionnaire (CDBQ) was developed by the thesis author for the current project in order assess respondents' experiences related to behaviours associated with cyberbullying perpetration and victimization. The CDBQ contains 37 items, presented from the perspective of both a cyberbullying victim (e.g., "Someone threatened me online") and cyberbullying perpetrator (e.g., "I have threatened someone online"). Items were developed based on Willard's (2007) classification of cyberbullying behaviours as falling into the broad categories of flaming (being involved in online fights or arguments; three items), harassment (sending insults or threats; 12 items), denigration (spreading rumours; four items), impersonation (pretending to be someone else online; six items), outing and trickery (revealing secrets entrusted to you; seven items), and exclusion (excluding someone from online social gatherings; five items). Response options range from *never* to *at least once a day*, and are based on respondents' experiences over the preceding 12 months. In addition, persons who endorse any behaviours associated with cyberbullying—regardless of their role—were asked an additional series of questions related to the definitional components that are associated with bullying and cyberbullying, including anonymity (e.g., "How did you know the person who did this?"), level of publicity (e.g., "How did the person distribute_____?"), perceived intent (e.g., "How much distress did the person

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[9] George and Mallery (2003) suggest the following qualitative descriptors for various ranges of coefficient alpha: $\geq$ .90: Excellent; $\geq$ .80: Good; $\geq$ .70: Acceptable; $\geq$ .60 Questionable; $\geq$ .50 Poor; $\leq$ .50: Unacceptable.

intend to cause you?"), power differential (e.g., "How popular are you compared to the person who did this to you?"), and occurring without provocation (e.g., "Do you feel you did something to initiate this behaviour?"). Finally, respondents were asked whether they classified the behaviour as cyberbullying, and the reason for their classification choice.

For the current study, the CDBQ–Victim measure demonstrated excellent internal consistency for the impersonation ($\alpha = .91$) items; good internal consistency for the flaming ($\alpha = .82$) and harassment ($\alpha = .84$) items; and acceptable internal consistency for the denigration ($\alpha = .79$), outing and trickery ($\alpha = .70$), and exclusion ($\alpha = .76$) items, based on George and Mallery's (2003) criteria. The CDBQ–Perpetrator measure demonstrated excellent internal consistency on the impersonation ($\alpha = .92$) and harassment ($\alpha = .91$) items; acceptable internal consistency on the flaming ($\alpha = .73$) and outing and trickery ($\alpha = .77$) items; questionable internal consistency on the exclusion ($\alpha = .69$) items; and poor internal consistency on the denigration ($\alpha = .57$) items. In the case of the exclusion items, it was determined that removal of one item ("I tried to turn someone's friends against them online") would increase coefficient alpha to .70. Similarly, removal of one item from the denigration items ("I gossiped about someone to others online") would increase coefficient alpha to .87. Note, however, that items were grouped together conceptually and these groupings have not been validated statistically via factor analysis; therefore, the variability displayed within certain groups is to be expected. Please refer to Appendix G for the full version of this instrument.

Bullying measure. The Bullying Behaviours among Postsecondary Students (BBPS) was developed by the thesis author for the current project in order assess respondents' experiences of and involvement in bullying behaviours. The BBPS contains eight items, presented to respondents from both the perspective of having been a victim of bullying (e.g., "Someone hit me because they were angry at me") as well as from being a perpetrator of bullying (e.g., "I hit someone because I was angry at them"). Questions were developed to examine the domains of social, verbal, and physical aggression, as per Underwood's (2003) typology, and specified that the bullying events could not have occurred online. Response options range from *never* to *at least once a day*, and are based on respondents' experiences over the preceding 12 months. For the current study, the BBPS–Victim demonstrated good internal consistency ($\alpha = .82$), while the BBPS–Perpetrator demonstrated acceptable internal consistency

($\alpha = .75$),[10] based on the criteria set out by George and Mallery (2003). Please refer to Appendix H for the full version of this instrument.

Internet addiction measure. The Internet Addiction Test (IAT; Young, 1998) is a 20-item scale that measures Internet dependency among adults. Items are scored on a five-point Likert-type scale ranging from *rarely* (1) to *always* (5); a *not applicable* (0) option is also available. Higher scores indicate greater levels of Internet dependency, with the following cut-off ranges established by extant research: 0 to 30 (normal level of Internet use), 31 to 49 (mild Internet addiction), 50 to 79 (moderate levels of Internet addiction), and 80 to 100 (severe Internet addiction). Sample items include questions such as, "How often do you prefer the excitement of the Internet over intimacy with your partner?" and, "How often do you snap, yell, or act annoyed if someone bothers you while you are online?" A recent meta-analysis (Frangos, Frangos, & Sotiropolous, 2012) reported that the overall internal consistency for this measure, as determined by the process of reliability generalization, is very good ($\alpha = .88$). For the current study, this instrument demonstrated very good internal consistency ($\alpha = .88$), based on the criteria set out by George and Mallery (2003). Please refer to Appendix I for the full version of this instrument.

Subjective wellbeing measure. The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) is a five-item questionnaire designed to measure a respondent's cognitive judgments of their SWB. Example questions include, "In most ways my life is close to my ideal," and "I am satisfied with my life." Items are answered on a seven-point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (7), with higher scores indicating greater cognitive judgements of SWB. Previous studies have provided reliability and validity evidence for this instrument (Pavot, Diener, Colvin & Sandvik, 1991). For instance, Pavot and colleagues (1991) found that the SWLS demonstrated reasonable internal consistency ($\alpha = .83$) and convergent validity ($r = .81$, $p < .01$) with another measure of SWB (i.e., the Life Satisfaction Inventory–A; Neugarten, Havighurst, & Tobin, 1961). For the current study, this instrument demonstrated excellent internal consistency ($\alpha = .91$), based on the criteria set out by George and Mallery (2003). Please refer to Appendix J for the full version of this instrument.

Procedure

An electronic survey containing all the measures was created using Voxco survey

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[10] Due to a low (i.e., two) number of items per type of aggression, coefficient alpha was calculated based on the total number of items within each respective version of this measure.

software. Students were recruited through the University of Saskatchewan's "Announcements" feature in their Personalized Access to Web Services (PAWS) account, as well as through the use of purposive (snowball) sampling via social media. Specifically, the author sent an invitation to his Facebook friends to complete the survey, which included a link to the electronic survey (refer to Appendix A for the Facebook and PAWS scripts). Persons who received the invitation were asked to pass the survey invitation on to their friends. In addition, participants who completed the survey were sent a thank-you email, which encouraged them to pass the survey link on to their friends (refer to Appendix A for the full text of the email). While it is possible that purposive sampling may have decreased participants' anonymous participation in the survey, this risk was mitigated in that no identifying information was collected that could link two participants (e.g., unique invitation codes, unique survey links, etc.). In addition, risk to anonymity was decreased through inviting prospective participants to complete an electronic, rather than pencil-and-paper, survey.

The survey began with a page that provided study information for participants so that participants could provide informed consent. At the bottom of this page, participants were provided with an opportunity to provide consent through clicking a button (please refer to Appendix B). Demographic information was presented next (Appendix D), followed by questions about participants' technology use (Appendix E). Participants then completed the RPQ (Appendix F), and the two conditions (i.e., victim and perpetrator) of the CDBQ (Appendix G). In order to decrease survey response time, the survey was programmed so that participants who had not experienced and/or perpetrated cyberbullying behaviours within the past 12 months did not complete that particular section of the CDBQ. Next, participants completed a questionnaire about bullying behaviours and experiences (Appendix H), a questionnaire about behaviours associated with Internet addiction (Appendix I), and then completed the SWLS (Appendix J). Upon completion of these measures, participants were given the option of entering their email address so that they could be entered for a draw of $250. After this, participants were taken to a final screen, which thanked them for their participation and provided them with links to more information regarding cyberbullying prevention and intervention. This page also provided contact information for participants who may have experienced distress from participation in the current study. On average, participants took approximately 30 minutes to complete the survey. Please refer to Appendix C for the debriefing form used.

Summary

      This chapter reviewed the methodology employed for the current research endeavour. Research questions were stated, and corresponding hypotheses were generated. A cross-sectional research design (i.e., survey methodology) was chosen in order to explore the relationships between aggression, bullying, and cyberbullying, as well as the utility of a novel theoretical framework (i.e., the I^3 Model) in conceptualizing cyberbullying behaviours. In total, 398 university students completed the online survey, which consisted of seven scales and questionnaires. The procedures for establishing consent and conducting the survey were reviewed. Finally, statistical techniques were specified in order to test the hypotheses. Chapter Four will review the results of the current study.

Chapter Four: Results

This chapter reviews the results of the statistical analyses employed to test the hypotheses set out in Chapter Three. This chapter reviews the survey response and completion rates, preliminary analyses and testing of assumptions related to the most appropriate statistical techniques to be employed, as well as a detailed summary of each statistical test employed to test the hypotheses. Specifically, the frequency of cyberbullying and traditional bullying victimization and perpetration were evaluated, the relationships between the constructs of aggression, bullying, and cyberbullying were measured via correlations, and the definitional components of cyberbullying were tested utilizing hierarchical multiple regression. This chapter concludes by reporting on efforts to test the utility of the I^3 Model for understanding cyberbullying occurrences through modelling the interactions between instigating, impelling, and inhibiting forces using moderation analyses.

Response and Completion Rate

Calculating the survey response rate is difficult, based on the fact that the author does not have an estimate of how many persons from the university made contact with the survey invitation. In total, 535 persons accessed the online survey and completed at least one of the questions. Of this number, 341 completed the survey in its entirety, while 194 dropped out at some point during the survey. Based on this information, the survey completion rate was 63.74%. Assuming that all university students ($N = 21,411$) had equal opportunity to encounter the survey invitation, the survey response rate is estimated to be 1.59%. Note that this figure is likely a significant underestimation of the actual response rate, which likely does not actually reflect how many university students viewed the survey.

However, another possible method of quantifying the response rate is to use the number of persons who clicked on the link—in this case, 1,827 participants—which would then indicate that the survey response rate was 18.67%. Note, however, that this response rate is still lower than what has been reported with other undergraduate students (e.g., Kaplowitz, Hadlock, & Levine, 2004). Certain guidelines suggest that a 30% response rate is necessary for adequate sampling coverage (Saldivar, 2012). As such, it is important to take into account that results from the current sample may not necessarily be generalizable to the entire University of Saskatchewan student population.

Preliminary Analysis and Testing of Assumptions

Using SPSS version 24, statistical analyses were conducted in order to test the influence

of the independent variable (gender) on the dependent variables (bullying victimization and perpetration, cyberbullying victimization and perpetration), and to examine the magnitude and directionality of relationships between the variables of aggression, cyberbullying perpetration/victimization, bullying victimization/perpetration, and SWB. Data were examined in order to determine whether assumptions related to parametric tests—that is, additivity and linearity, normality, homoscedasticity of variance, and independence (Field, 2013)—were not violated.

Visual inspection of the data (e.g., histograms, Q-Q plots), as well as the Kolmogorov-Smirnoff test statistic, determined that all variables were distributed non-normally. While the Kolmogorov-Smirnoff statistic lacks specificity in large samples (Field, 2013), the data nonetheless indicated significant positive skew and leptokurtosis. This finding is due to the phenomenon of the sample variance exceeding the mean—a commonly-occurring issue in criminological research (Hope & Norris, 2013; McDowall, 2010). As can be seen from Table 4-1, standard deviations are higher than the mean on the RPQ–Proactive, both versions of the CDBQ, and both versions of the BBPS, indicating that the majority of participants endorsed low levels of aggressive and bullying behaviours, with a small minority engaging in greater intensity in these behaviours. In addition, the distribution of frequencies for victimization and perpetration illustrate the skewed distribution of the data, as is evident from Tables 3 and 4.

In order to address this threat to the assumption of normality, robust statistical techniques (i.e., bootstrapping) were employed. Specifically, bootstrapping is "a statistical technique to estimate the variance of a parameter when standard assumptions about the shape of the data set are not met" (APA, 2014, p. 31). The variance is estimated through resampling the data a specified number of times (usually 1,000 times or more), calculating the mean of the resampled data, and compiling the resampled data into a bootstrapped distribution (Hesterberg, 2014). The bootstrapped confidence interval is the confidence interval for this distribution. This resampling method does not rely on the assumption of normality; it also assumes that the sample distribution approximates the population distribution and is therefore representative of the population in question (Ong, 2014).

While nonparametric designs are generally used when data is non-normally distributed, certain researchers (e.g., Field, 2013; Norman, 2010) have pointed out that parametric designs often remain robust even when assumptions of normality have been violated. In addition, the small number of nonparametric tests limits the types of analyses that can be conducted on data.

In order to test the hypotheses of the current study, parametric designs with bootstrapping were utilized to analyze the data from this study.

Table 4-1. *Descriptive Statistics for Measures Used.*

	n	*M* (*SD*)	95% CI	# Items	Poss. Range	Act. Range
RPQ	371	7.40 (4.53)	6.93, 7.86	23	0 – 46	0 – 37
Proactive	376	1.23 (1.96)	1.03, 1.42	11	0 – 22	0 – 18
Reactive	374	6.16 (3.14)	5.84, 6.48	12	0 – 24	0 – 19
CDBQ						
Victim	332	10.43 (12.19)	9.11, 11.74	37	0 – 185	0 – 75
Perpetrator	303	4.91 (9.82)	3.79, 6.02	37	0 – 185	0 – 126
BBPS						
Victim	319	3.49 (4.16)	3.04, 3.95	8	0 – 40	0 – 28
Perpetrator	322	1.43 (2.54)	1.15, 1.71	8	0 – 40	0 – 26
IAT	313	34.81 (11.05)	33.59, 36.04	20	0 – 100	0 – 78
SWLS	316	25.04 (6.93)	24.27, 25.80	5	5 – 35	5 – 35

Notes. Poss. Range = possible range for scale scores; Act. Range = actual range of scale scores; RPQ = Reactive-Proactive Aggression Questionnaire; CDBQ = Cyberbullying Definitions and Behaviours Questionnaire; BBPS = Bullying Behaviours among Postsecondary Students; IAT = Internet Addiction Test; SWLS = Satisfaction with Life Scale.

Occurrence Rates of Bullying and Cyberbullying

Cyberbullying victimization. In order to calculate the number of incidents of cyberbullying, responses on the CDBQ–V were coded dichotomously to reflect either no self-reported incidents of cyberbullying (0) or at least one incident of cyberbullying over the past 12 months (1). Of the sample, 15.30% (*n* = 54) reported no experiences of cyberbullying over the past 12 months, while the remaining 84.9% reported a minimum of one instance (range: 1–37). In addition, 25.78% (*n* = 91) of the sample recorded the highest frequency of experiencing a particular cyberbullying behaviour was at least once a year, while 31.73% (*n* = 112) indicated that the highest frequency of experiencing a particular cyberbullying behaviour was at least once every few months. Refer to Tables 4-2 and 4-3 for full descriptive statistics regarding the frequencies of self-reported victimization. Due to the small cell size (*n* = 7) of persons identifying as other than male or female, these participants were excluded from subsequent gender-based analyses but were included when conducting total sample analyses.

Responses were analyzed using chi-square tests to examine demographic variables against experiences of cyberbullying victimization. There were no associations between gender

and cyberbullying victimization, $\chi^2 (1) = .63$, $p = .43$. Chi-square analyses were also conducted to determine whether the type of cyberbullying behaviour was associated with gender. No significant associations were found between gender and flaming, $\chi^2 (1) = .06$, $p = .81$, harassment, $\chi^2 (1) = .18$, $p = .71$, denigration, $\chi^2 (1) = 1.20$, $p = .28$, impersonation, $\chi^2 (1) = .35$, $p = .62$, outing and trickery, $\chi^2 (1) = .28$, $p = .63$, or exclusion, $\chi^2 (1) = .49$, $p = .52$.

In order to determine whether there were significant group differences between males and females in the frequency of specific cyberbullying behaviours, bootstrapped independent samples *t*-tests with 1,000 samples and bias-corrected and accelerated confidence intervals (Efron & Tibshirani, 1993) were calculated for all items of the CDBQ–V. Note that others (i.e., Norman, 2010) have pointed out that the use of independent samples *t*-tests is appropriate for the analysis of Likert-type data, suggesting that this statistical procedure—in conjunction with employing robust statistical parameter estimates—is suitable for the following series of analyses.

Comparison of mean differences between males and females revealed important distinctions on variables related to being threatened online (items 7, 15, and 32), having been trolled online (item 2), having one's social media account hacked (items 11 and 17), and receiving unwanted sexual messages and pictures or videos (items 26 and 27). As can be noted from Table 4-4, males ($M = .59$, $SD = 1.06$) were significantly more likely than females ($M = .36$, $SD = .71$) to have been trolled online, $t(134.14) = 2.04$, $p < .05$, equal variances not assumed, Cohen's $d = .25$ (small effect size).[11] Across three different questions (items, 7, 15, and 32), males were significantly more likely to report having been threatened online, though effect sizes, as measured by Cohen's d, were small (.27–.44). Two items (item 11 and 17) on the CDBQ–V pertain to having one's social media account hacked. In both instances, males were significantly more likely to report having their social media accounts hacked, though effect sizes were small (.25–.36).

Females reported significantly higher rates of receiving unwanted sexual communication. Females ($M = .62$, $SD = .99$) were significantly more likely than males ($M = .41$, $SD = .80$) to report receiving unwanted sexual messages, $t(232.59) = -2.07$, $p < .05$, equal variances not assumed, $d = .23$ (small effect size). Similarly, females ($M = .55$, $SD = .90$) were also more likely than males ($M = .35$, $SD = .76$) to report receiving unwanted sexual pictures or videos, $t(221.52) = -2.01$, $p < .05$, equal variances not assumed, $d = .24$ (small effect size).

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[11] Cohen's (1988) criteria were used to qualitatively describe the magnitude of an effect size.

Table 4-2. *Frequencies of Cyberbullying Occurrences in Past 12 Months (Victim and Perpetrator).*

	Male				Female				Other				Total			
	Victim		Perpetrator		Victim		Perpetrator		Victim		Perpetrator		Victim		Perpetrator	
#	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
0	13	12.75	23	27.71	39	16.05	62	29.11	2	28.57	3	50.00	54	15.30	89	29.37
1	14	13.73	16	19.28	29	11.93	39	18.31	0	–	0	–	43	12.18	55	18.15
2	11	10.78	11	13.25	10	4.12	25	11.74	0	–	0	–	21	5.95	36	11.88
3	14	13.73	13	15.66	17	7.00	22	10.33	0	–	1	16.67	31	8.78	36	11.88
4	7	6.86	4	4.82	15	6.17	19	8.92	0	–	2	33.33	22	6.23	25	8.25
5	1	0.98	3	3.61	16	6.58	17	7.98	1	14.29	0	–	18	5.10	20	6.60
6	5	4.90	1	1.20	18	7.41	12	5.63	1	14.29	0	–	24	6.80	13	4.29
7	5	4.90	1	1.20	12	4.94	6	2.82	0	–	0	–	17	4.82	7	2.31
8	3	2.94	2	2.41	16	6.58	2	0.94	1	14.29	0	–	21	5.95	4	1.32
9	7	6.86	2	2.41	9	3.70	4	1.88	0	–	0	–	16	4.53	6	1.98
10	3	2.94	0	–	8	3.29	3	1.41	0	–	0	–	11	3.12	3	0.99
11	1	0.98	2	2.41	4	1.65	0	–	0	–	0	–	5	1.42	2	0.66
12	0	–	1	1.20	11	4.53	0	–	0	–	0	–	11	3.12	1	0.33
13	2	1.96	1	1.20	4	1.65	0	–	0	–	0	–	6	1.70	1	0.33
14	2	1.96	0	–	11	4.53	0	–	0	–	0	–	13	3.68	0	–
15	1	0.98	0	–	4	1.65	0	–	0	–	0	–	5	1.42	0	–
16	1	0.98	0	–	2	0.82	0	–	0	–	0	–	3	0.85	0	–
17	0	–	0	–	3	1.23	1	0.47	1	14.29	0	–	4	1.13	1	0.33
18	3	2.94	0	–	3	1.23	0	–	1	14.29	0	–	7	1.98	0	–
20	0	–	0	–	0	–	1	0.47	0	–	0	–	0	–	1	0.33
21	1	0.98	0	–	1	0.41	0	–	0	–	0	–	2	0.57	0	–
22	2	1.96	0	–	2	0.82	0	–	0	–	0	–	4	1.13	0	–
23	0	–	0	–	2	0.82	0	–	0	–	0	–	2	0.57	0	–
24	0	–	0	–	1	0.41	0	–	0	–	0	–	1	0.28	0	–
25	1	0.98	0	–	3	1.23	0	–	0	–	0	–	4	1.13	0	–
26	0	–	0	–	1	0.41	0	–	0	–	0	–	1	0.28	0	–
27	1	0.98	0	–	0	–	0	–	0	–	0	–	1	0.28	0	–
28	0	–	0	–	1	0.41	0	–	0	–	0	–	1	0.28	0	–
34	1	0.98	0	–	0	–	0	–	0	–	0	–	1	0.28	0	–
35	0	–	0	–	0	–	0	–	0	–	0	–	0	–	0	–
36	1	0.98	0	–	0	–	0	–	0	–	0	–	1	0.28	0	–
37	2	1.96	3	3.61	1	0.41	0	–	0	–	0	–	1	0.28	3	0.99
	102	100%	83	100%	243	100%	213	100%	7	100%	6	100%	353	100%	303	100%

Notes. # denotes the number of cyberbullying incidents reported by the participant. Empty rows (e.g., 19, 29-33) deleted.

Table 4-3. *Highest Self-Reported Frequency of Cyberbullying Victimization and Perpetration in Past 12 Months.*

	Males				Females				Total Sample			
	Victim		Perpetrator		Victim		Perpetrator		Victim		Perpetrator	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Never	13	12.75	23	27.71	39	16.05	62	29.11	54	15.30	89	29.37
At least once a year	27	26.47	26	31.33	63	25.93	55	25.82	91	25.78	81	26.73
At least once every few months	32	31.37	18	21.69	78	32.10	50	23.47	112	31.73	69	22.77
At least once a month	16	15.69	5	6.02	40	16.46	32	15.02	59	16.71	38	12.54
At least once a week	13	12.75	8	9.64	19	7.82	13	6.10	32	9.07	22	7.26
At least once a day	1	0.98	3	3.61	4	1.65	1	0.47	5	1.42	4	1.32
Total	102	100%	83	100%	243	100%	213	100%	353	100%	303	100%

Table 4-4. *CDBQ–Victim Descriptive Statistics and t-test Results.*

Description		Male (n = 102)	Female (n = 243)	t	d
1) Someone started an argument with me online because of something I posted.	M (SD)	.78 (1.20)	.53 (.79)	1.925[a]	.24
	BCa 95% CI	.55, 1.03	.43, .63		
	Range	0–5	0–3		
2) Someone trolled me because of things I shared online.	M (SD)	.59 (1.06)	.36 (.71)	2.04[a]*	.25
	BCa 95% CI	.40, .81	.27, .44		
	Range	0–4	0–3		
3) Someone spread rumours about me online.	M (SD)	.27 (.66)	.26 (.56)	0.23	.01
	BCa 95% CI	.16, .40	.20, .33		
	Range	0–4	0–4		
4) Someone created a social media account and pretended to be me.	M (SD)	.15 (.55)	.07 (.25)	1.35[a]	.18
	BCa 95% CI	.06, .24	.04, .10		
	Range	0–4	0–1		
5) Someone posted inappropriate pictures of me online without my permission.	M (SD)	.17 (.56)	.09 (.30)	1.23[a]	.17
	BCa 95% CI	.07, .29	.06, .13		
	Range	0–4	0–2		
6) Someone purposely unfriended/unfollowed me on social media because they were mad at me.	M (SD)	.53 (.80)	.72 (.78)	−2.03	−.24
	BCa 95% CI	.39, .68	.63, .83		
	Range	0–4	0–4		
7) Someone threatened me online.	M (SD)	.41 (.89)	.16 (.46)	2.59[a]*	.35
	BCa 95% CI	.26, .58	.11, .23		
	Range	0–4	0–4		
8) Someone hacked into one of my social media accounts and pretended to be me.	M (SD)	.23 (.64)	.10 (.36)	1.87[a]	.25
	BCa 95% CI	.12, .34	.06, .15		
	Range	0–4	0–3		
9) Someone verbally attacked me for something I posted online.	M (SD)	.38 (.87)	.26 (.60)	1.30[a]	.16
	BCa 95% CI	.23, .57	.19, .33		
	Range	0–5	0–3		
10) Someone gossiped to others about me online.	M (SD)	.50 (.93)	.57 (.86)	−0.71	−.07
	BCa 95% CI	.32, .69	.47, .68		
	Range	0–4	0–4		
11) Someone hacked in to one of my social media accounts and posted inappropriate things to other people.	M (SD)	.15 (.52)	.04 (.22)	2.09[a]*	.27
	BCa 95% CI	.06, .26	.02, .06		
	Range	0–3	0–2		
12) Someone trolled my updates or pictures to friends.	M (SD)	.21 (.60)	.15 (.47)	0.91[a]	.11
	BCa 95% CI	.11, .33	.09, .21		
	Range	0–3	0–3		

13) Someone took a picture or video of me and posted it without my permission.	M (SD)	.57 (.87)	.39 (.74)	1.80[a]	.22
	BCa 95% CI	.41, .74	.30, .47		
	Range	0–3	0–4		
14) Someone has tried to turn my friends against me online.	M (SD)	.20 (.54)	.20 (.50)	−0.04[a]	0.0
	BCa 95% CI	.10, .30	.14, .27		
	Range	0–3	0–3		
15) Someone online threatened to harm me.	M (SD)	.4 (.87)	.10 (.38)	3.42[a]**	.44
	BCa 95% CI	.25, .57	.05, .15		
	Range	0–4	0–3		
16) Someone picked a fight with me online.	M (SD)	.53 (1.06)	.37 (.69)	1.42[a]	.17
	BCa 95% CI	.34, .73	.28, .45		
	Range	0–5	0–4		
17) Someone hacked into one of my social media accounts and posted things I wouldn't post.	M (SD)	.19 (.55)	.04 (.19)	2.63[a]*	.36
	BCa 95% CI	.09, .30	.02, .06		
	Range	0–4	0–2		
18) Someone made hurtful comments to me about a status update or post I shared.	M (SD)	.30 (.72)	.22 (.50)	1.06[a]	.12
	BCa 95% CI	.18, .44	.16, .29		
	Range	0–4	0–2		
19) Someone made hurtful comments to me about a picture or video I shared online.	M (SD)	.27 (.64)	.20 (.49)	0.99[a]	.12
	BCa 95% CI	.16, .39	.14, .28		
	Range	0–3	0–2		
20) A former partner shared intimate pictures and/or videos of me online.	M (SD)	.10 (.47)	.02 (.14)	1.60[a]	.23
	BCa 95% CI	.03, .19	.00, .04		
	Range	0–4	0–1		
21) Someone has excluded me from online groups or messages because they don't like me.	M (SD)	.37 (.82)	.45 (.74)	−0.83	−.10
	BCa 95% CI	.24, .54	.35, .55		
	Range	0–4	0–4		
22) Someone sent me nasty, mean, and/or insulting messages.	M (SD)	.50 (.91)	.33 (.64)	1.77[a]	.21
	BCa 95% CI	.34, .66	.25, .42		
	Range	0–4	0–3		
23) Someone sent me nasty, mean, and/or insulting pictures or videos.	M (SD)	.28 (.75)	.14 (.46)	1.74[a]	.22
	BCa 95% CI	.16, .40	.09, .19		
	Range	0–4	0–3		
24) Someone befriended me online in order to get private information from me.	M (SD)	.21 (.47)	.21 (.52)	.01	0.0
	BCa 95% CI	.13, .30	.15, .26		
	Range	0–2	0–3		
25) A person randomly attacked me online for something I liked or shared.	M (SD)	.42 (1.01)	.22 (.60)	1.85[a]	.24
	BCa 95% CI	.23, .61	.15, .30		
	Range	0–5	0–4		

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26) Someone sent me unwanted sexually explicit messages.	*M* (*SD*) BCa 95% CI Range	.41 (.80) .26, .57 0–3	.62 (.99) .50, .76 0–5	−2.07[a]*	−.23
27) Someone sent me unwanted sexually explicit pictures or videos.	*M* (*SD*) BCa 95% CI Range	.35 (.76) .22, .51 0–4	.55 (.90) .43, .67 0–4	−2.01[a]*	−.24
28) Someone tried to stir up trouble between me and another person by sharing false information.	*M* (*SD*) BCa 95% CI Range	.24 (.61) .14, .34 0–3	.22 (.55) .16, .29 0–3	.19	.03
29) Someone kept hacking into my social media accounts.	*M* (*SD*) BCa 95% CI Range	.11 (.48) .03, .20 0–3	.06 (.34) .02, .10 0–4	.95[a]	.12
30) Someone has shared confidential information online that I trusted them with.	*M* (*SD*) BCa 95% CI Range	.25 (.71) .13, .40 0–4	.12 (.40) .07, .17 0–2	1.68[a]	.22
31) Someone has deliberately ignored my online messages to them.	*M* (*SD*) BCa 95% CI Range	.91 (1.09) .71, 1.12 0–5	.93 (1.14) .79, 1.08 0–5	−0.14	−.01
32) Someone online threatened my life.	*M* (*SD*) BCa 95% CI Range	.25 (.67) .13, .40 0–4	.09 (.46) .04, .16 0–5	2.14[a]*	.27
33) Someone continually spread the same rumour about me online.	*M* (*SD*) BCa 95% CI Range	.12 (.38) .05, .20 0–2	.08 (.34) .04, .13 0–3	0.96	.11
34) Someone set up a social media account and pretended to be me.	*M* (*SD*) BCa 95% CI Range	.11 (.44) .04, .21 0–4	.03 (.16) .01, .05 0–1	1.75[a]	.24
35) Someone took personal information about me and shared it online without my permission.	*M* (*SD*) BCa 95% CI Range	.15 (.49) .07, .24 0–3	.07 (.26) .04, .10 0–2	1.57[a]	.20
36) Someone has deliberately not accepted my friend requests online in order to exclude me.	*M* (*SD*) BCa 95% CI Range	.32 (.70) .21, .44 0–3	.32 (.57) .24, .39 0–3	0.10	0.0
37) Someone took a screenshot of a private photo or video I sent them that was meant to disappear (i.e., a Snapchat).	*M* (*SD*) BCa 95% CI Range	.55 (.99) .37, .74 0–4	.72 (1.09) .59, .86 0–5	−1.33	−.16

Notes. [a] Equal variances not assumed; * *p* < .05; ** *p* < .01; range value interpretation: 0 (never), 1 (at least once a year), 2 (at least once every few months), 3 (at least once a month), 4 (at least once a week), 5 (at least once a day); Cohen's *d* calculated using Becker's (1999) online calculator.

Cyberbullying perpetration. In order to calculate the number of incidents of cyberbullying, responses to the CDBQ–P were coded dichotomously to reflect either no self-reported incidents of cyberbullying perpetration (0) or at least one incident of cyberbullying perpetration over the past 12 months (1). Of the sample, 29.37% (n = 89) reported not engaging in cyberbullying behaviours over the past 12 months, while the remaining 70.6% reported engaging in at least one instance (range: 1–37). In addition, 26.73% (n = 81) of the sample recorded the highest frequency of engaging in a particular cyberbullying behaviour was at least once a year, while 22.77% (n = 69) indicated that the highest frequency of engaging in a particular cyberbullying behaviour was at least once every few months. Refer to Tables 3 and 4 for full descriptive statistics regarding the frequencies of self-reported victimization.

Responses were analyzed using chi-square tests to examine demographic variables against experiences of cyberbullying perpetration. There were no gender differences in cyberbullying perpetration over the past 12 months, χ^2 (1) = .05, p = .88. Chi-square analyses were also conducted to determine whether the type of cyberbullying behaviour was associated with gender. There was a significant association between gender and flaming, χ^2 (1) = 7.29, p = .009. Based on the odds ratio, males were 1.97 times more likely to cyberbully others through flaming than females. There was also a significant association between harassment and gender, χ^2 (1) = 9.14, p = .003. Based on the odds ratio, males were 2.30 times more likely to cyberbully others through harassment than females. There was a significant association between gender and impersonation, χ^2 (1) = 12.62, p = .001, suggesting that males were more likely to perpetrate cyberbullying through impersonation than females; however, one cell was below the minimum expected frequency of five, indicating that this result may not be interpretable. Finally, there was a significant association between gender and exclusion, χ^2 (1) = 5.33, p = .02. Based on the odds ratio, females were 3.15 times more likely to cyberbully others through exclusion than males. No significant associations were found between gender and denigration, χ^2 (1) = .35, p = .56, or outing and trickery, χ^2 (1) = .57, p = .48.

CDBQ–P results were then analyzed to determine mean differences between cyberbullying perpetration items and gender, using bootstrapped independent samples t-tests with 1,000 samples and bias-corrected and accelerated confidence intervals. Table 4-5 demonstrates the restriction of range in responses from female participants pertaining to items related to impersonation (items 8, 11, 17, and 29), sharing intimate pictures or videos of a former partner (item 20), or threatening someone's life online (item 32).

Comparison of mean differences between genders also yielded other important information concerning cyberbullying perpetration. Males scored significantly higher on two items (1, 25) pertaining to flaming. That is, males ($M = .75$, $SD = 1.13$) were significantly more likely than females ($M = .36$, $SD = .70$) to start an argument online with others, $t(121.56) = 3.07$, $p = .003$, equal variances not assumed, $d = .41$ (small effect size). As well, males ($M = .22$, $SD = .84$) were significantly more likely than females ($M = .00$, $SD = .06$) to randomly attack someone online, $t(93.47) = 2.51$, $p = .01$, equal variances not assumed, $d = .36$ (small effect size).

Males also scored significantly higher on six items (2, 7, 12, 22, 23, and 27) pertaining to harassment. Specifically, males were found to be significantly more likely to engage in trolling (Cohen's d range: .32–.41), threatening others online ($d = .31$), sending insulting messages ($d = .44$) and pictures or videos ($d =. 37$), and sending unwanted sexually explicit pictures or videos ($d = .34$). These findings suggest that harassment is a common cyberbullying behaviour for males, confirmed by the chi-square analysis above.

On three items pertaining to impersonation on the CDBQ–P (item 4, 8, and 17), males scored significantly higher than females. Specifically, males ($M = .12$, $SD = .41$) were significantly more likely than females ($M = .02$, $SD = .19$) to create a social media account and pretend to be someone else, $t(109.48) = 2.15$, $p = .03$, equal variances not assumed, $d = .31$ (small effect size). Results for items 8 and 17 (both involving hacking into another person's social media account) were significant; however, this is due to the fact that no female participants endorsed ever engaging in these behaviours. This again speaks to gender differences in cyberbullying perpetration, and suggests that this instrument may require different items to better capture the range of female cyberbullying behaviours.

Table 4-5. *CDBQ – Perpetrator Descriptive Statistics and t-test Results.*

Description		Male (*n* = 98)	Female (*n* = 202)	*t*	*d*
1) I started an argument with someone online because of something they posted.	M (SD)	.75 (1.13)	.36 (.70)	3.07[a]**	.41
	BCa 95% CI	.55, 1.00	.28, .46		
	Range	0–5	0–4		
2) I trolled someone because of things they shared online.	M (SD)	.44 (.97)	.09 (.37)	3.40[a]**	.47
	BCa 95% CI	.28, .64	.04, .14		
	Range	0–5	0–3		
3) I spread rumours about someone online.	M (SD)	.10 (.49)	.03 (.20)	1.34[a]	.18
	BCa 95% CI	.02, .18	.00, .05		

	Range	0–4	0–2		
4) I created a social media account and pretended to be someone else.	M (SD)	.12 (.41)	.02, (.19)	2.15[a]*	.31
	BCa 95% CI	.05, .20	.00, .05		
	Range	0–3	0–2		
5) I posted inappropriate pictures of someone online without their permission.	M (SD)	.11 (.49)	.01 (.11)	1.80[a]	.28
	BCa 95% CI	.03, .20	.00, .03		
	Range	0–4	0–1		
6) I purposefully unfriended/unfollowed someone on social media because I was mad at them.	M (SD)	.42 (.72)	.48 (.71)	–0.66	–.08
	BCa 95% CI	.29, .56	.39, .56		
	Range	0–3	0–3		
7) I threatened someone online.	M (SD)	.10 (.44)	.00 (.06)	1.99[a]*	.31
	BCa 95% CI	.02, .18	.00, .01		
	Range	0–3	0–1		
8) I hacked into someone's social media accounts and pretended to be them.	M (SD)	.10 (.41)	.00 (.00)	2.22[a]*	.34
	BCa 95% CI	.03, .17	–		
	Range	0–3	**0**		
9) I verbally attacked someone for something they posted online.	M (SD)	.18 (.70)	.06 (.30)	1.59[a]	.22
	BCa 95% CI	.07, .33	.03, .10		
	Range	0–5	0–3		
10) I gossiped about someone to others online.	M (SD)	.33 (.78)	.45 (.91)	–1.12[a]	–.14
	BCa 95% CI	.19, .51	.34, .57		
	Range	0–4	0–4		
11) I hacked into someone's social media accounts and posted inappropriate things to other people.	M (SD)	.10 (.53)	.00 (.00)	1.75[a]	.26
	BCa 95% CI	.01, .21	–		
	Range	0–4	**0**		
12) I trolled someone's updates or pictures to friends.	M (SD)	.27 (.93)	.05 (.27)	2.24[a]*	.32
	BCa 95% CI	.11, .47	.02, .08		
	Range	0–5	0–2		
13) I took a picture or video of someone and posted it online without their permission.	M (SD)	.18 (.67)	.04 (.22)	1.94[a]	.28
	BCa 95% CI	.07, .33	.02, .07		
	Range	0–4	0–2		
14) I tried to turn someone's friends against them online.	M (SD)	.08 (.45)	.01 (.11)	1.31[a]	.21
	BCa 95% CI	.01, .18	.00, .03		
	Range	0–4	0–1		
15) I threatened harm to someone online.	M (SD)	.12 (.67)	.01 (.09)	1.56[a]	.23
	BCa 95% CI	.01, .27	.00, .02		
	Range	0–5	0–1		
16) I picked a fight with someone online.	M (SD)	.24 (.83)	.15 (.43)	1.00[a]	.13
	BCa 95% CI	.10, .40	.10, .21		

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		0–5	0–2		
	Range	0–5	0–2		
17) I hacked into someone's social media accounts and posted things they wouldn't post.	M (SD)	.11 (.45)	.00 (.00)	2.28[a]*	.34
	BCa 95% CI	.04, .20	–		
	Range	0–3	**0**		
18) I made hurtful comments to someone about a status update or post they shared.	M (SD)	.17 (.72)	.02 (.13)	2.06[a]*	.28
	BCa 95% CI	.04, .33	.00, .04		
	Range	0–5	0–1		
19) I made hurtful comments to someone about a picture or video they shared.	M (SD)	.20 (.79)	.04 (.21)	1.93[a]	.27
	BCa 95% CI	.06, .37	.01, .07		
	Range	0–5	0–2		
20) I shared intimate pictures and/or videos of a former partner online.	M (SD)	.10 (.49)	.00 (.00)	1.90[a]	.28
	BCa 95% CI	.02, .19	–		
	Range	0–4	**0**		
21) I excluded someone from online groups or messages because I don't like them.	M (SD)	.19 (.59)	.28 (.64)	−1.19[a]	−.14
	BCa 95% CI	.10, .30	.20, .37		
	Range	0–4	0–4		
22) I sent someone nasty, mean, and/or insulting messages.	M (SD)	.28 (.78)	.03 (.19)	3.01[a]**	.44
	BCa 95% CI	.14, .42	.01, .05		
	Range	0–4	0–2		
23) I sent someone nasty, mean, and/or insulting pictures or videos.	M (SD)	.20 (.72)	.01 (.09)	2.57[a]*	.37
	BCa 95% CI	.08, .34	.00, .02		
	Range	0–4	0–1		
24) I befriended someone online in order to get private information from them.	M (SD)	.11 (.47)	.07 (.35)	.84	.09
	BCa 95% CI	.03, .19	.03, .11		
	Range	0–3	0–3		
25) I randomly attacked someone for something they liked or shared online.	M (SD)	.22 (.84)	.00 (.06)	2.51[a]*	.36
	BCa 95% CI	.09, .38	.00, .01		
	Range	0–5	0–1		
26) I sent someone unwanted sexually explicit messages.	M (SD)	.09 (.40)	.02 (.21)	1.53[a]	.21
	BCa 95% CI	.02, .17	.00, .04		
	Range	0–3	0–3		
27) I sent someone unwanted sexually explicit pictures or videos.	M (SD)	.12 (.43)	.01 (.14)	2.25[a]*	.34
	BCa 95% CI	.04, .21	.00, .03		
	Range	0–3	0–2		
28) I tried to stir up trouble between someone and another person online through sharing false information.	M (SD)	.06 (.38)	.00 (.06)	1.49[a]	.22
	BCa 95% CI	.00, .14	.00, .01		
	Range	0–3	0–1		
29) I kept hacking in to someone's social media accounts.	M (SD)	.06 (35)	.00 (.00)	1.75[a]	.24
	BCa 95% CI	.01, .14	–		

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	Range	0–3	**0**		
30) I shared confidential information online that someone trusted me with.	M (SD)	.12 (.52)	.02 (.16)	1.80[a]	.25
	BCa 95% CI	.03, .23	.00, .04		
	Range	0–4	0–2		
31) I deliberately ignored someone's online messages to me.	M (SD)	.77 (1.34)	.96 (1.20)	−1.24	−.14
	BCa 95% CI	.51, 1.04	.81, 1.12		
	Range	0–5	0–5		
32) I threatened someone's life online.	M (SD)	.12 (.60)	.00 (.00)	1.88[a]	.28
	BCa 95% CI	.02, .23	–		
	Range	0–4	**0**		
33) I continually spread the same rumour about someone online.	M (SD)	.14 (.69)	.00 (.06)	1.85[a]	.28
	BCa 95% CI	.03, .27	.00, .01		
	Range	0–5	0–1		
34) I set up a social media account and pretended to be someone else.	M (SD)	.10 (.44)	.02 (.27)	1.50[a]	.21
	BCa 95% CI	.03, .18	.00, .06		
	Range	0–3	0–4		
35) I took personal information about someone and shared it online without their permission.	M (SD)	.07 (.39)	.00 (.06)	1.71[a]	.25
	BCa 95% CI	.01, .16	.00, .01		
	Range	0–3	0–1		
36) I deliberately did not accept someone's friend requests online in order to exclude them.	M (SD)	.33 (.76)	.32 (.68)	0.05	.01
	BCa 95% CI	.20, .48	.23, .41		
	Range	0–3	0–4		
37) I took a screenshot of a private picture or video someone sent me that is meant to disappear (i.e., a Snapchat).	M (SD)	.38 (.84)	.45 (.93)	−0.62	−.07
	BCa 95% CI	.23, .53	.32, .59		
	Range	0–4	0–5		

Notes. [a] Equal variances not assumed; * $p < .05$; ** $p < .01$; range value interpretation: 0 (never), 1 (at least once a year), 2 (at least once every few months), 3 (at least once a month), 4 (at least once a week), 5 (at least once a day); Cohen's *d* calculated using Becker's (1999) online calculator.

Traditional bullying victimization. In order to calculate the number of incidents of traditional bullying, responses to the BBPS–V were coded dichotomously to reflect either no self-reported incidents of bullying victimization (0) or at least one incident of bullying victimization over the past 12 months (1). Of the sample, 25.08% ($n = 80$) reported not having experienced bullying behaviours over the previous 12 months, while the remaining 74.92% reported experiencing at least one instance (range: 0–8). In addition, 24.22% ($n = 78$) of the sample recorded the highest frequency of experiencing a particular bullying behaviour was at least once a year, while 15.84% ($n = 51$) indicated that the highest frequency of experiencing a particular bullying behaviour was at least once every few months. Full descriptive statistics,

separated by gender, are available on Tables 7 and 8.

Responses were analyzed using chi-square tests to examine demographic variables against experiences of cyberbullying perpetration. There were no associations between gender and bullying victimization, $\chi^2(1) = .08$, $p = .77$. Chi-square analyses were also conducted to determine whether the type of bullying behaviour (e.g., physical aggression, direct social aggression, indirect social aggression, and verbal aggression) was associated with gender. There was a significant association between gender and bullying through physical aggression, $\chi^2(1) = 8.66$, $p = .004$. Based on the odds ratio, males were 2.24 times more likely to be bullied through physical aggression as compared to females.

There was also a significant association between gender and bullying through indirect social aggression, $\chi^2(1) = 4.05$, $p = .04$. Based on the odds ratio, females were 1.67 times more likely to be bullied through indirect social aggression as compared to males. No significant associations were found between gender and direct social aggression, $\chi^2(1) = 1.68$, $p = .20$, or verbal aggression, $\chi^2(1) = .96$, $p = .38$.

Results from the BBPS–V were then analyzed to determine mean differences between bullying victimization items and gender using bootstrapped independent samples t-tests with 1,000 samples and bias-corrected and accelerated confidence intervals. As can be seen on Table 4-8, males reported higher levels of bullying victimization. For instance, males ($M = .42$, $SD = .80$) were significantly more likely than females ($M = .18$, $SD = .49$) to report having been hit by someone out of anger, $t(120.65) = 2.72$, $p = .007$, equal variances not assumed, $d = .36$ (small effect). Males ($M = .48$, $SD = .92$) were also more likely than females ($M = .23$, $SD = .56$) to report having been threatened, $t(120.65) = 2.38$, $p = .01$, equal variances not assumed, $d = .31$ (small effect). As well, males ($M = .21$, $SD = .60$) were significantly more likely than females ($M = .07$, $SD = .36$) to report having been blackmailed over the past year, $t(118.76) = 2.00$, $p = .04$, equal variances not assumed, $d = .28$ (small effect). While other items failed to demonstrate significant mean differences, it is important to note that males and females reported similar levels of being socially excluded, having rumours spread about them, being pushed or shoved out of anger, and experiencing relationship manipulation. Note as well that, while the mean scores suggest that these experiences occur rather infrequently, some participants indicated these behaviours occurred on a monthly or weekly basis.

Table 4-6. *Frequencies of Bullying Occurrences in Past 12 Months (Victim and Perpetrator).*

	Male				Female				Other				Total			
	Victim		Perpetrator		Victim		Perpetrator		Victim		Perpetrator		Victim		Perpetrator	
#	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
0	21	23.08	51	54.84	56	25.34	118	53.15	3	50.00	5	83.33	80	25.08	175	54.35
1	23	25.27	17	18.28	41	18.55	44	19.82	1	16.67	1	16.67	66	20.69	62	19.25
2	15	16.48	8	8.60	40	18.10	38	17.12	0	–	0	–	55	17.24	46	14.29
3	6	6.59	8	8.60	33	14.93	11	4.95	1	16.67	0	–	40	12.54	19	5.90
4	5	5.49	4	4.30	24	10.86	7	3.15	1	16.67	0	–	30	9.40	11	3.42
5	3	3.30	2	2.15	12	5.43	2	0.90	0	–	0	–	15	4.70	4	1.24
6	10	10.99	0	–	5	2.26	2	0.90	0	–	0	–	15	4.70	2	0.62
7	4	4.40	1	1.08	7	3.17	0	–	0	–	0	–	11	3.45	1	0.31
8	4	4.40	2	2.5	3	1.36	0	–	0	–	0	–	7	2.19	2	0.62
	91	100%	93	100%	221	100%	222	100%	6	100%		100%	319	100%	322	100%

Note. # denotes the number of cyberbullying incidents reported by the participant.

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Table 4-7. *Highest Self-Reported Frequency of Bullying Victimization and Perpetration in Past 12 Months.*

	Males				Females				Total Sample			
	Victim		Perpetrator		Victim		Perpetrator		Victim		Perpetrator	
	n	%	n	%	n	%	n	%	n	%	n	%
Never	21	23.08	51	54.84	56	25.34	118	53.15	80	25.08	175	54.35
At least once a year	31	34.07	18	19.35	70	31.67	60	27.03	103	32.29	78	24.22
At least once every few months	22	24.18	13	13.98	61	27.60	38	17.12	84	26.33	51	15.84
At least once a month	8	8.79	5	5.38	28	12.67	4	1.80	36	11.29	9	2.80
At least once a week	8	8.79	5	5.38	3	1.36	2	0.90	12	3.76	7	2.17
At least once a day	1	1.10	1	1.08	3	1.36	0	–	4	1.25	2	0.62
Total	91	100%		100%	221	100%	222	100%	319	100%	322	100%

Table 4-8. *BBPS–Victim Descriptive Statistics and t-test Results.*

Description		Male (n = 91)	Female (n = 221)	t	d
1) Someone hit me because they were angry with me.	M (SD)	.42 (.80)	.18 (.49)	2.72[a]**	.36
	BCa 95% CI	.27, .59	.12, .25		
	Range	0–4	0–3		
2) Someone threatened me (but not online).	M (SD)	.48 (.92)	.23 (.56)	2.38[a]*	.31
	BCa 95% CI	.31, .66	.16, .31		
	Range	0–4	0–4		
3) Someone excluded me from social outings.	M (SD)	.87 (1.06)	.98 (.96)	−0.88	−.10
	BCa 95% CI	.66, 1.09	.86, 1.10		
	Range	0–4	0–4		
4) Someone spread rumours about me (but not online).	M (SD)	.49 (.90)	.56 (.78)	−0.67	−.08
	BCa 95% CI	.31, .68	.46, .65		
	Range	0–4	0–3		
5) Someone pushed or shoved me out of anger.	M (SD)	.36 (.72)	.21 (.61)	1.73[a]	.22
	BCa 95% CI	.22, .51	.14, .29		
	Range	0–4	0–5		
6) Someone called me inappropriate names (but not online).	M (SD)	.90 (1.26)	.78 (1.11)	0.88	.10
	BCa 95% CI	.66, 1.16	.63, .92		
	Range	0–5	0–5		
7) Someone tried to get my friends to turn against me (but not online).	M (SD)	.37 (.76)	.28 (.62)	1.05	.12
	BCa 95% CI	.22, .52	.21, .36		
	Range	0–4	0–3		
8) Someone blackmailed me (but not online).	M (SD)	.21 (.60)	.07 (.36)	2.00[a]*	.28
	BCa 95% CI	.09, .34	.03, .12		
	Range	0–3	0–3		

Notes. [a] Equal variances not assumed; * $p < .05$; ** $p < .01$; range value interpretation: 0 (never), 1 (at least once a year), 2 (at least once every few months), 3 (at least once a month), 4 (at least once a week), 5 (at least once a day); Cohen's *d* calculated using Becker's (1999) online calculator.

Traditional bullying perpetration. In order to calculate the number of incidents of traditional bullying, responses to the BBPS–P were coded dichotomously to reflect either no self-reported incidents of bullying perpetration (0) or at least one incident of bullying perpetration over the past 12 months (1). Of the sample, 54.35% (n = 175) reported not engaging in bullying behaviours over the past 12 months, while the remaining 45.65% reported engaging in at least one instance (range: 0–8). In addition, 24.22% (n = 78) of the sample recorded the highest frequency of experiencing a particular bullying behaviour was at least once a year, while 15.84%

($n = 51$) indicated that the highest frequency of experiencing a particular bullying behaviour was at least once every few months. Refer to Tables 4-6 and 4-7 for full sample descriptive statistics.

Responses were analyzed using chi-square tests to examine demographic variables against experiences of cyberbullying perpetration. There were no associations between gender and bullying perpetration, $\chi^2(1) = .07$, $p = .80$. Chi-square analyses were also conducted to determine whether the type of bullying behaviour (e.g., physical aggression, direct social aggression, indirect social aggression, and verbal aggression) was associated with gender. No significant associations were found between gender and the type of aggression perpetrated: physical aggression, $\chi^2(1) = 0.46$, $p = .55$, direct social aggression, $\chi^2(1) = 0.28$, $p = .60$, indirect social aggression, $\chi^2(1) = 0.01$, $p = .99$, or verbal aggression, $\chi^2(1) = 2.39$, $p = .13$.

Mean differences of bullying perpetration between males and females were then analyzed using bootstrapped independent samples t-tests with 1,000 samples and bias-corrected and accelerated confidence intervals. As can be seen on Table 4-9, males indicated higher levels of bullying perpetration on two items querying verbal aggression. Specifically, males ($M = .16$, $SD = .47$) were significantly more likely than females ($M = .02$, $SD = .14$) to report threatening someone, $t(99.70) = 2.77$, $p = .007$, equal variances not assumed, $d = .40$ (small effect size). As well, males ($M = .71$, $SD = 1.17$) were significantly more likely than females ($M = .38$, $SD = .73$) to report calling someone inappropriate names, $t(122.55) = 2.48$, $p = .01$, equal variances not assumed, $d = .33$ (small effect size). It is interesting to note that mean differences were not found for items related to physical aggression, direct social aggression, or indirect social aggression, indicating that females in the current sample engaged in these forms of bullying at similar levels to their male counterparts.

Table 4-9. *BBPS–Perpetrator Descriptive Statistics and t-test Results.*

Description		Male ($n =$)	Female ($n =$)	t	d
1) I hit someone because I was angry with them.	M (SD)	.11 (.49)	.08 (.34)	0.53	.07
	BCa 95% CI	.03, .22	.04, .12		
	Range	0–4	0–3		
2) I threatened someone (but not online).	M (SD)	.16 (.47)	.02 (.14)	2.77[a]**	.40
	BCa 95% CI	.08, .27	.00, .04		
	Range	0–3	0–1		
3) I excluded someone from social outings.	M (SD)	.43 (.78)	.46 (.74)	−0.36	−.03
	BCa 95% CI	.28, .61	.37, .56		
	Range	0–4	0–4		

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4) I spread rumours about someone (but not online).	*M* (*SD*)	.16 (.55)	.13 (.42)	0.53	.06
	BCa 95% CI	.06, .29	.08, .18		
	Range	0–3	0–3		
5) I pushed or shoved someone out of anger.	*M* (*SD*)	.14 (.54)	.08 (.32)	0.91[a]	.13
	BCa 95% CI	.05, .24	.04, .13		
	Range	0–4	0–2		
6) I called someone inappropriate names (but not online).	*M* (*SD*)	.71 (1.17)	.38 (.73)	2.48[a]*	.33
	BCa 95% CI	.48, .98	.29, .47		
	Range	0–5	0–4		
7) I tried to get my friends to turn against someone (but not online).	*M* (*SD*)	.13 (.55)	.06 (.30)	1.08[a]	.15
	BCa 95% CI	.04, .24	.03, .10		
	Range	0–3	0–3		
8) I blackmailed someone (but not online).	*M* (*SD*)	.09 (.40)	.01 (.13)	1.78[a]	.26
	BCa 95% CI	.02, .17	.00, .03		
	Range	0–3	0–2		

Notes. [a] Equal variances not assumed; * $p < .05$; ** $p < .01$; range value interpretation: 0 (never), 1 (at least once a year), 2 (at least once every few months), 3 (at least once a month), 4 (at least once a week), 5 (at least once a day); Cohen's *d* calculated using Becker's (1999) online calculator.

Relationships Between Aggression, Bullying, and Cyberbullying

In order to evaluate the relationships between proactive and reactive aggression, traditional bullying, and cyberbullying, bootstrapped Pearson's product-moment correlation coefficients with 1,000 samples and bias-corrected and accelerated confidence intervals were calculated for each of the variables of interest.   Correlations were conducted on the sample as a whole and were also conducted based on reported gender in order to increase the sensitivity to detecting differences in the variables of interest between males and females. Results separated by gender are reported in Table 4-10. For the full sample ($n = 267$), proactive aggression, as measured by the proactive aggression subscale of the RPQ, was significantly associated with cyberbullying perpetration, $r = .41$, 95% BCa CI [.21, .57], $p < .001$, and traditional bullying perpetration, $r = .36$, 95% BCa CI [.23, .50], $p < .001$. Similarly, cyberbullying victimization was positively associated with cyberbullying perpetration, $r = .67$, 95% BCa CI [.52, .78], $p < .001$, traditional bullying victimization, $r = .58$, 95% BCa CI [.47, .68], $p < .001$, and traditional bullying perpetration, $r = .48$, 95% BCa CI [.34, .60], $p < .001$, providing evidence of the interrelatedness of these constructs. Similar to the results of the main sample analysis, male participants' ratings of proactive aggression were significantly associated with cyberbullying perpetration, $r = .54$, 95% BCa CI [.21, .76], $p < .001$, and traditional bullying perpetration, $r =$

.48, 95% BCa CI [.26, .68], $p < .001$. Female participants' ratings of proactive aggression were also significantly associated with cyberbullying perpetration, $r = .24$, 95% BCa CI [.04, .45], $p < .01$, and traditional bullying perpetration, $r = .25$, 95% BCa CI [.08, .40], $p < .01$. Note, however, the decrease in magnitude between the correlation coefficients between male and female participants.

Modelling the Relationships Between Bullying and Cyberbullying Components

       Analysis of cyberbullying victimization. In order to determine whether cyberbullying would meet the definitional threshold for traditional bullying, a hierarchical multiple regression was conducted to test the influence of the predictors (intent to harm, power imbalance) on the outcome of cyberbullying victimization frequency (repetition), as measured by participants' scores on the CDBQ–V. Repetition was taken from participants' highest endorsed frequency of cyberbullying victimization, and were dummy coded into five categories (Never v. At least once a year, Never v. At least once every few months, Never v. At least once a month, Never v. At least once a week, Never v. At least once a day). Intent to harm was taken from participants' ratings of how much harm their perpetrator intended to inflict on them, a continuous variable ranging from 1 (*did not intend distress*) to 10 (*intended extreme distress*). The power imbalance variable was tested through dummy coding participants' responses to their perceived popularity (e.g., "How popular are you as compared to the person who did this?"), physical strength (e.g., "How physically strong are you as compared to the person who did this?"), intelligence (e.g., "How intelligent are you as compared to the person who did this?"), and technological skills (e.g., "How technologically skilled [e.g., website building, coding, hacking] are you as compared to the person who did this?") in order to determine their relative impact on the outcome variable (response options: *less _____ than*, *equally as _____*, and *more _____ than*).

       Specifically, six models were tested: Model 1 (repetition), Model 2 (repetition + intent), Model 3 (repetition + intent + power imbalance: popularity), Model 4 (repetition + intent + power imbalance: popularity + power imbalance: physical strength), Model 5 (repetition + intent + power imbalance: popularity + power imbalance: physical strength + power imbalance: intelligence) and Model 6 (repetition + intent + power imbalance: popularity + power imbalance: physical strength + power imbalance: intelligence + power imbalance: technological skills). The regression equation was significant for all six models, with each one demonstrating an increase in the R^2 statistic (refer to Table 4-11 for specific values). In total, 66 participants contributed data to the predictor and outcome variables. The model accounting for the most variance in

Table 4-10. *Matrix of Correlation Coefficients, Separated by Gender.*

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. RPQ Total	–	.84 [.75, .89]	.93 [.89, .95]	.45 [.22, .63]	.50 [.28, .66]	.42 [.21, .59]	.46 [.26, .62]	.29* [.05, .50]	−.14ns [−.38, .13]
2. RPQ – Proactive	.74 [.65, .81]	–	.58 [.43, .69]	.51 [.21, .75]	.54 [.21, .76]	.48 [.21, .68]	.48 [.26, .68]	.24* [.00, .49]	−.13ns [−.37, .11]
3. RPQ – Reactive	.95 [.93, .97]	.50 [.38, .61]	–	.33** [.14, .50]	.38** [.21, .52]	.31** [.13, .49]	.37** [.16, .55]	.28* [.03, .49]	−.12ns [−.33, .13]
4. CDBQ – Victim	.20* [.04, .36]	.12ns [−.06, .32]	.21** [.06, .35]	–	.77 [.48, .90]	.58 [.37, .76]	.58 [.37, .77]	.32** [.00, .58]	−.18ns [−.40, .03]
5. CDBQ – Perpetrator	.26 [.10, .41]	.24** [.04, .45]	.22** [.08, .36]	.60 [.44, .74]	–	.36** [.11, .63]	.58 [.32, .84]	.45** [.19, .68]	−.06ns [−.27, .10]
6. BBPS – Victim	.17* [.03, .31]	.09ns [−.07, .26]	.18* [.05, .31]	.59 [.44, .72]	.39 [.23, .52]	–	.68 [.51, .80]	.23* [−.00, .45]	−.30** [−.47, −.10]
7. BBPS – Perpetrator	.28 [.16, .42]	.25** [.08, .40]	.25** [.08, .40]	.43 [.28, .56]	.59 [.48, .69]	.54 [.35, .69]	–	.40 [.13, .61]	−.12ns [−.31, .07]
8. IAT	.30 [.16, .44]	.31 [.15, .48]	.25** [.10, .39]	.27 [.07, .45]	.37 [.19, .53]	.16* [.00, .30]	.21** [.06, .36]	–	−.18 [−.42, .07]
9. SWLS	−.19* [−.36, −.08]	−.18* [−.33, −.01]	−.16* [−.33, .01]	−.16* [−.32, −.01]	−.15* [−.32, .05]	−.24** [−.42, −.07]	−.18 [−.15, .11]	−.20** [−.37, −.02]	–

Notes. All correlations significant at *p* < .001, unless otherwise noted. ns non-significant; * *p* < .05; ** *p* < .01. Correlations reported above the diagonal are male participants (*n* = 78); correlations below the diagonal are female participants (*n* = 183). BCa bootstrap 95% CIs reported in brackets. RPQ: Reactive-Proactive Aggression Questionnaire; CDBQ: Cyberbullying Definitions and Behaviours Questionnaire; BBPS: Bullying Behaviours among Postsecondary Students Questionnaire; IAT: Internet Addiction Test; SWLS: Satisfaction with Life Scale.

cyberbullying victimization was the final model containing all predictors, R^2 = .47, adjusted R^2 =
.33, $F(13, 52)$ = 3.48, p = .001. For this model, being cyberbullied at least once a month, $t(52)$ =
2.35, p = .02, being cyberbullied at least once a week, $t(52)$ = 4.01, p < .001, and intended
distress, $t(52)$ = 2.03, p = .04, were the only significant predictors on the outcome variable.

Follow-up analyses were conducted in order to determine whether assumptions
underlying this statistical test were violated. The Durbin-Watson case statistic was 2.06,
suggesting that errors in the model were independent of each other. All VIF values were well
below 10 (range: 1.25 – 2.24) and all tolerance statistics were well above 0.2 (range: 0.44 –
0.79), indicating a lack of multicollinearity in the data. Three statistics were used to examine for
influential cases in the model: Cook's distance, leverage values, and Mahalanobis distances. The
Cook's distance statistic indicated that no cases were greater than 1, suggesting that there were
no influential cases in the overall sample utilizing this statistic. Fourteen cases were found with
leverage values greater than 0.227[12], indicating that there were a significant number of cases with
above-average leverage values. Mahalanobis distances greater than 23.68[13] were flagged; in the
current sample, three cases were found to have values in excess of the critical value. Covariance
ratios below –0.318 and greater than 1.681[14] were noted; in the current sample, three cases were
greater than the upper bound while none fell below the lower bound. These findings suggest that
there are influential cases in the overall model. This finding is not surprising, considering the
fact that, as previously stated, the victimization data is positively skewed, with a small
percentage of persons experiencing significant levels of victimization.

Examination of scatterplots indicated that the data violated the assumptions of linearity
and homogeneity of variance, in that the distribution of scores did not appear to be random and
the P-P plot of the standardized residual was not linear. As these assumptions were violated, a
robust multiple regression model was calculated, utilizing bootstrapping with 1,000 samples[15]
and bias-corrected and accelerated confidence intervals; these results are reported in Table 4-11.
Note that in the robust analysis, the only variable that significantly predicted greater diversity of
cyberbullying experiences in Model 6 was being cyberbullied every day. Due to insufficient

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[12] Based on Field's (2014) guidelines, average leverage values are defined as $(k + 1)/n$, where k is equal to the
number of predictors and n is the number of participants. In the current case, there were 14 predictors and 66
participants, which would lead to a value of 0.227.
[13] Based on a chi-square distribution with 14 degrees of freedom, p < .05 (critical values provided by Field, 2014).
[14] Boundaries calculated as per Field's (2014) instructions. Upper bound: $1 + [3(k +1)/n]$ = 1.681; lower bound: $1 –
[3(k +1)/n]$ = –0.318.
[15] Due to missing data, the actual number of bootstrapped samples ranged between 270 to 275 samples per model.

sample size, subscale analyses were not conducted.

Analysis of cyberbullying perpetration. A hierarchical multiple regression was also conducted to determine whether the traditional components of bullying (repetition, intent to harm, power differential) were significant in predicting cyberbullying perpetration, as evidenced by participants' CDBQ–P scores. Repetition was taken from participants' highest endorsed frequency of cyberbullying perpetration, and were dummy coded into five categories (Never v. At least once a year, Never v. At least once every few months, Never v. At least once a month, Never v. At least once a week, Never v. At least once a day). Intent to harm was taken from participants' ratings of how much harm they intended to inflict on their victim, a continuous variable ranging from 1 (*did not intend distress*) to 10 (*intended extreme distress*). The power imbalance variable was tested through dummy coding participants' responses to their perceived popularity (e.g., "How popular are you as compared to the target?"), physical strength (e.g., "How physically strong are you as compared to the target?"), intelligence (e.g., "How intelligent are you as compared to the target?"), and technological skills (e.g., "How technologically skilled [e.g., website building, coding, hacking] are you as compared to the target?") in order to determine their relative impact on the outcome variable (response options: *less ____ than*, *equally as ____*, and *more ____ than*).

Again, six models were tested: Model 1 (repetition), Model 2 (repetition + intent), Model 3 (repetition + intent + power imbalance: popularity), Model 4 (repetition + intent + power imbalance: popularity + power imbalance: physical strength), Model 5 (repetition + intent + power imbalance: popularity + power imbalance: physical strength + power imbalance: intelligence) and Model 6 (repetition + intent + power imbalance: popularity + power imbalance: physical strength + power imbalance: intelligence + power imbalance: technological skills). The model which explained the most variance was Model 3, $R^2 = .45$, adjusted $R^2 = .36$, $F(6, 35) = 4.80$, $p = .001$. For this model, cyberbullying others at least once a week, $t(35) = 3.97$, $p < .001$, was the only significant predictor of participants' total cyberbullying perpetration score.[16] Complete statistics for each model are reported in Table 4-12.

Follow-up analyses were conducted in order to determine whether assumptions underlying this statistical test were violated. The Durbin-Watson case statistic was 2.68, suggesting that errors in the model were independent of each other. All VIF values were well

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[16] In fact, this variable was the only significant variable across all models. Note that, due to missing data, the dummy variable "Never v. At least once a day" was not tested for any of these models.

below 10 (range: 1.08 – 2.34) and all tolerance statistics were well above 0.2 (range: 0.43 – 0.87), indicating a lack of multicollinearity in the data. Three statistics were used to examine for influential cases in the model: Cook's distance, leverage values, and Mahalanobis distances. The Cook's distance statistic indicated that one case had a statistic greater than 1, suggesting that one influential case within the overall sample. Four cases were found with leverage values greater than 0.357.[17] No cases were found with Mahalanobis distances greater than 23.68.[18] Covariance ratios below 0.071 and greater than 2.071[19] were noted; in the current sample, four cases were greater than the upper bound while two fell below the lower bound. These findings suggest that there are influential cases in the overall model.

Examination of scatterplots indicated that the data violated the assumptions of linearity and homogeneity of variance, in that the distribution of scores did not appear to be random and the P-P plot of the standardized residual was not linear. As these assumptions were violated, a robust multiple regression model was calculated, utilizing bootstrapping with 1,000 samples[20] and bias-corrected and accelerated confidence intervals; these results are reported in Table 4-12. Note that in the robust analysis, no predictors were found to be significant. Due to insufficient sample size, subscale analyses were not conducted.

Testing the Unique Features of Cyberbullying

Cyberbullying victimization. In order to examine whether the unique variables of cyberbullying—namely anonymity, the publicity of the event, perceived victim distress, and whether the event occurred without provocation—predicted the outcome of cyberbullying victimization, a hierarchical multiple regression was conducted. Anonymity was tested through the use of dummy coding (friend v. person known from school, friend v. person known from community, friend v. person known online, friend v. anonymous person). Level of publicity was taken from dummy coding participants' self-reports of how public the event was (private v. semi-privately, private v. publicly, private v. multiple venues). Level of perceived victim distress was taken from participants' ratings of how much distress they experienced from the cyberbullying incident. Whether the event occurred without provocation was taken from the

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[17] Based on Field's (2014) guidelines, average leverage values are defined as $(k + 1)/n$, where k is equal to the number of predictors and n is the number of participants. In the current case, there were 14 predictors and 42 participants, which would lead to a value of 0.357.

[18] Based on a chi-square distribution with 14 degrees of freedom, $p < .05$ (critical values provided by Field, 2014).

[19] Boundaries calculated as per Field's (2014) instructions. Upper bound: $1 + [3(k + 1)/n] = 2.071$; lower bound: $1 – [3(k + 1)/n] = 0.071$.

[20] Due to missing data, the actual number of bootstrapped samples ranged between 310 to 324 samples per model.

Table 4-11. *Linear Model of Predictors of the Change in Cyberbullying Victimization Scores.*

Step	R^2 (Adj. R^2)	F		b	SE B	ß	p
1	.328 (.284)	(4, 61) = 7.43***					
			Constant	9.18 [7.07, 11.86]	1.16		.004
			R: Never v. At least once a year	0.60 [−3.77, 5.10]	2.42	.02	.841
			R: Never v. At least once a month	8.81 [2.25, 19.28]	4.56	.27	.080
			R: Never v. At least once a week	27.21 [2.64, 45.65]	10.57	.55	**.029**
			R: Never v. At least once a day	12.81 [10.25, 14.88]	1.16	.12	.266
2	.363 (.310)	(5, 60) = 6.84***	Constant	5.81[1.12, 10.41]	1.92		.011
			R: Never v. At least once a year	−1.42 [−6.10, 3.80]	2.67	−.05	.696
			R: Never v. At least once a month	8.08 [1.93, 18.82]	4.61	.25	.098
			R: Never v. At least once a week	24.83 [1.63, 43.97]	10.50	.50	**.029**
			R: Never v. At least once a day	12.08 [9.47, 14.68]	1.28	.11	**.004**
			I: Distress intended by perpetrator	0.82 [−0.10, 1.58]	0.45	.20	.116
3	.391 (.318)	(7, 58) = 5.33***	Constant	8.91 [3.61, 14.96]	2.91		.004
			R: Never v. At least once a year	−1.43 [−6.33, 3.98]	2.78	−.05	.699
			R: Never v. At least once a month	8.98 [1.56, 21.33]	4.95	.28	.101
			R: Never v. At least once a week	25.96 [−0.02, 46.24]	10.89	.52	**.029**
			R: Never v. At least once a day	13.39 [8.68, 17.94]	2.25	.12	**.004**
			I: Distress intended by perpetrator	0.79 [−0.13, 1.65]	0.48	.19	.145
			P-P: More popular v. Equally popular	−5.28 [−13.56, 3.16]	4.10	−.19	.239
			P-P: More popular v. Less popular	−4.26 [−11.32, 3.52]	3.77	−.15	.297
4	.425 (.333)	(9, 56) = 4.61***	Constant	12.57 [3.86, 23.09]	4.66		.011
			R: Never v. At least once a year	−2.09 [−6.88, 3.13]	2.57	−.07	.464
			R: Never v. At least once a month	8.37 [0.96, 19.82]	4.77	.26	.112
			R: Never v. At least once a week	23.53 [−2.67, 44.60]	10.97	.47	.069
			R: Never v. At least once a day	14.02 [6.70, 20.77]	3.66	.13	**.018**
			I: Distress intended by perpetrator	0.75 [−0.11, 1.43]	0.49	.18	.170
			P-P: More popular v. Equally popular	−3.48 [−10.15, 3.91]	3.78	−.12	.424
			P-P: More popular v. Less popular	−3.04 [−9.39, 4.60]	3.53	−.11	.424
			P-H: Stronger v. Equally as strong	−5.29 [−15.73, 4.66]	4.67	−.17	.308
			P-H: Stronger v. Weaker	−5.87 [−14.55, 0.54]	3.71	−.22	.127
5	.442 (.328)	(11, 54) = 3.88***	Constant	10.77 [2.88, 22.52]	4.50		.026
			R: Never v. At least once a year	−2.23 [−7.20, 3.52]	2.82	−.08	.465

				B [95% CI]	SE	β	p
			R: Never v. At least once a month	8.31 [0.00, 20.08]	4.85	.26	.125
			R: Never v. At least once a week	24.06 [–2.51, 44.65]	10.72	.48	.052
			R: Never v. At least once a day	15.35 [5.69, 22.86]	4.27	.14	**.030**
			I: Distress intended by perpetrator	0.81 [0.79, 1.25]	0.50	.20	.144
			P-P: More popular v. Equally popular	–4.93 [–13.78, 2.89]	4.33	–.18	.306
			P-P: More popular v. Less popular	–3.48 [–10.33, 4.63]	3.59	–.13	.391
			P-H: Stronger v. Equally as strong	–4.68 [–16.60, 8.42]	4.64	–.15	.373
			P-H: Stronger v. Weaker	–4.97 [–13.14, 2.65]	3.58	–.19	.188
			P-I: More intelligent v. Equally intelligent	3.74 [–1.68, 9.01]	3.26	.14	.306
			P-I: More intelligent v. Less intelligent	3.12 [–6.90, 19.66]	6.18	.06	.587
6	.466 (.332)	(13, 52) = 3.48**	Constant	8.68 [0.90, 18.82]	4.56		.092
			R: Never v. At least once a year	–2.10 [–6.91, 3.97]	3.00	–.07	.517
			R: Never v. At least once a month	8.98 [–0.39, 22.15]	5.11	.28	.122
			R: Never v. At least once a week	23.27 [–0.56, 43.14]	10.71	.47	.074
			R: Never v. At least once a day	18.60 [9.19, 28.84]	4.59	.17	**.015**
			I: Distress intended by perpetrator	0.94 [0.20, 1.47]	0.49	.23	.103
			P-P: More popular v. Equally popular	–5.46 [–14.85, 3.80]	4.78	–.19	.306
			P-P: More popular v. Less popular	–3.99 [–12.16, 4.69]	3.69	–.14	.314
			P-H: Stronger v. Equally as strong	–5.99 [–15.48, 4.06]	4.85	–.19	.310
			P-H: Stronger v. Weaker	–4.99 [–13.83, 2.70]	3.85	–.19	.203
			P-I: More intelligent v. Equally intelligent	3.02 [–3.10, 7.76]	3.06	.11	.365
			P-I: More intelligent v. Less intelligent	3.07 [–8.50, 22.63]	7.14	.06	.631
			P-T: More tech skills v. Equal tech skills	4.87 [–2.18, 12.38]	3.81	.18	.240
			P-T: More tech skills v. Less tech skills	0.66 [–6.86, 6.92]	3.96	.02	.863

Notes. R: repetition, *I:* intent, *P-P:* power imbalance–popularity, *P-H:* power imbalance–physical strength, *P-I:* power imbalance–intelligence, *P-T:* power imbalance–technological skills. * $p < .05$, ** $p < .01$, *** $p < .001$. 95% BCa CIs reported in parentheses. Standard errors and significance levels based on bootstrapped results. Results based on 270 to 275 bootstrapped samples.

Table 4-12. *Linear Model of Predictors of the Change in Cyberbullying Perpetration Scores.*

Step	R^2 (Adjusted R^2)	F		b	SE B	ß	p
1	.327 (.274)	(3, 38) = 6.15[**]					
			Constant	3.06 [1.94, 4.44]	0.54		.063
			R: Never v. At least once every few months	6.29 [2.21, 3.58]	3.01	.15	.239
			R: Never v. At least once a month	7.49 [4.49, 0.98]	1.62	.16	.093
			R: Never v. At least once a week	45.60 [6.26, 123.40]	34.73	.60	.439
2	.392 (.326)	(4, 37) = 5.95[**]					
			Constant	−5.17 [−22.65, 4.57]	4.88		.478
			R: Never v. At least once every few months	4.45 [−1.35, 12.61]	3.35	.11	.400
			R: Never v. At least once a month	8.41 [4.15, 12.90]	2.12	.18	.099
			R: Never v. At least once a week	41.29 [5.28, 120.15]	32.68	.54	.445
			I: Distress intended to target	3.13 [0.36, 4.87]	1.79	.26	.352
3	.452 (.358)	(6, 35) = 4.80[**]					
			Constant	3.12 [−2.86, 9.53]	3.39		.374
			R: Never v. At least once every few months	2.06 [−6.11, 10.66]	4.16	.05	.718
			R: Never v. At least once a month	6.36 [−3.30, 11.95]	3.37	.13	.172
			R: Never v. At least once a week	40.78 [5.25, 117.65]	34.14	.54	.433
			I: Distress intended to target	2.88 [0.28, 4.78]	1.64	.24	.328
			P-P: More popular v. Equally popular	−10.17 [−24.78, 1.20]	5.94	−.26	.359
			P-P: More popular v. Less popular	−10.28 [−21.33, 1.32]	6.08	−.15	.307
4	.474 (.346)	(8, 33) = 3.71[**]					
			Constant	7.52 [2.83, 11.51]	4.76		.280
			R: Never v. At least once every few months	3.07 [−6.52, 12.93]	4.85	.07	.618
			R: Never v. At least once a month	7.22 [−2.16, 14.89]	4.14	.15	.172
			R: Never v. At least once a week	39.48 [2.20, 114.91]	30.77	.52	.440
			I: Distress intended to target	2.57 [0.14, 4.52]	1.50	.22	.311
			P-P: More popular v. Equally popular	−9.34 [−25.46, 1.11]	6.15	−.24	.403
			P-P: More popular v. Less popular	−9.07 [−20.67, 1.84]	6.39	−.14	.348
			P-H: Stronger v. Equally as strong	−5.91 [− , −]	4.22	−.15	.332
			P-H: Stronger v. Weaker	−7.21 [−22.88, 6.99]	5.38	−.17	.338
5	.486 (.320)	(10, 31) = 2.93[**]					
			Constant	7.50 [2.96, .99]	4.93		.305

	R^2 (SE)	F	Predictor	B [95% CI]	SE	β	p
			R: Never v. At least once every few months	2.61 [−6.41, 14.40]	4.81	.06	.662
			R: Never v. At least once a month	7.80 [−3.03, 19.64]	4.85	.16	.148
			R: Never v. At least once a week	42.32 [−2.34, 17.25]	33.22	.56	.450
			I: Distress intended to target	2.44 [0.12, 4.71]	1.53	.21	.328
			P-P: More popular v. Equally popular	−8.46 [−24.28, 1.08]	4.91	−.22	.312
			P-P: More popular v. Less popular	−8.70 [−20.82, 2.36]	6.59	−.13	.376
			P-H: Stronger v. Equally as strong	−5.89 [− , −]	4.70	−.15	.357
			P-H: Stronger v. Weaker	−7.03 [−25.53, 7.65]	6.17	−.17	.434
			P-I: More intelligent v. Equally intelligent	0.69 [−12.16, 9.86]	3.65	.02	.871
			P-I: More intelligent v. Less intelligent	−8.80 [−68.74, 15.71]	21.41	−.12	.756
6	.494 (.284)	(12, 29) = 2.36**					
			Constant	8.55 [1.10, 15.25]	6.85		.338
			R: Never v. At least once every few months	1.66 [−9.93, 14.71]	6.05	.04	.826
			R: Never v. At least once a month	7.61 [−4.21, 20.96]	5.68	.16	.235
			R: Never v. At least once a week	41.70 [−2.82, 117.47]	34.01	.55	.476
			I: Distress intended to target	2.51 [−0.09, 5.45]	1.88	.21	.412
			P-P: More popular v. Equally popular	−8.13 [−28.27, 7.19]	6.06	−.21	.434
			P-P: More popular v. Less popular	−8.15 [−24.55, 4.81]	7.69	−.12	.453
			P-H: Stronger v. Equally as strong	−6.06 [− , −]	5.38	−.15	.434
			P-H: Stronger v. Weaker	−7.29 [−27.37, 10.40]	6.66	−.17	.453
			P-I: More intelligent v. Equally intelligent	1.00 [−12.17, 10.28]	4.45	.02	.859
			P-I: More intelligent v. Less intelligent	−8.25 [−71.87, 15.77]	22.36	−.11	.785
			P-T: More tech skills v. Equal tech skills	−3.06 [−17.90, 7.99]	6.32	−.08	.740
			P-T: More tech skills v. Less tech skills	1.09 [−13.06, 14.79]	8.82	.02	.936

Notes. R: repetition, I: intent, P-P: power imbalance–popularity, P-H: power imbalance–physical strength, P-I: power imbalance–intelligence, P-T: power imbalance–technological skills. * $p < .05$, ** $p < .01$, *** $p < .001$. 95% BCa CIs reported in parentheses. Standard errors and significance levels based on bootstrapped results. Results based on 310 to 324 bootstrapped samples.

question, "Do you feel that you did something to provoke initiate this behaviour/response from the other person?" with response options being binary (yes/no). Four models were tested: Model 1 (anonymity of the event), Model 2 (anonymity + publicity), Model 3 (anonymity + publicity + perceived victim distress), and Model 4 (anonymity + publicity + perceived victim distress + level of provocation). The regression equations were not significant for any model, Model 1: R^2 = .01, adjusted R^2 = –.01, $F(4, 198) = 0.45$, $p = .775$; Model 2: R^2 = .02, adjusted R^2 = –.02, $F(7, 195) = 0.56$, $p = .790$; Model 3: R^2 = .05, adjusted R^2 = .01, $F(8, 194) = 1.32$, $p = .233$; Model 4: R^2 = .06, adjusted R^2 = .01, $F(9, 193) = 1.30$, $p = .236$. The only predictor found to be significant in any model was perceived distress from cyberbullying, Model 3, $t(193) = 2.56$, $p = .01$, and Model 4, $t(193) = 2.54$, $p = .01$. In total, 203 participants contributed data to the predictor and outcome variables.

Follow-up analyses were conducted in order to determine whether assumptions underlying this statistical test were violated. The Durbin-Watson case statistic was 1.93, suggesting that errors in the model were not independent of each other. All VIF values were well below 10 (range: 1.09 – 1.25) and all tolerance statistics were well above 0.2 (range: 0.80 – 0.93), indicating a lack of multicollinearity in the data. Three statistics were used to examine for influential cases in the model: Cook's distance, leverage values, and Mahalanobis distances. The Cook's distance statistic indicated that no cases were greater than 1, suggesting that there were no influential cases in the overall sample utilizing this statistic. Thirty-five cases were found with leverage values greater than 0.049[21], indicating that there were a significant number of cases with above-average leverage values. Mahalanobis distances greater than 16.92[22] were flagged; in the current sample, 11 cases were found to have values in excess of the critical value. Covariance ratios below –0.852 and greater than 1.148[23] were noted; in the current sample, four cases were greater than the upper bound while none fell below the lower bound. Taken together, these findings suggest that there were several influential cases in the overall model.

Examination of scatterplots indicated that the data violated the assumptions of linearity and homogeneity of variance, in that the distribution of scores did not appear to be random and the P-P plot of the standardized residual was not linear. As these assumptions were violated, a

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[21] Based on Field's (2014) guidelines, average leverage values are defined as $(k + 1)/n$, where k is equal to the number of predictors and n is the number of participants. In the current case, there were 9 predictors and 203 participants, which would lead to a value of 0.049.

[22] Based on a chi-square distribution with 9 degrees of freedom, $p < .05$ (critical values provided by Field, 2014).

[23] Boundaries calculated as per Field's (2014) instructions. Upper bound: $1 + [3(k + 1)/n] = 1.148$; lower bound: $1 – [3(k + 1)/n] = –0.852$.

robust multiple regression model was calculated, utilizing bootstrapping with 1,000 samples and bias-corrected and accelerated confidence intervals. In the robust regression, the only predictor found to reach significance was perceived victim distress; no other predictors significantly predicted the outcome of participants' cyberbullying victimization score. Due to insufficient sample size, subscale analyses were not conducted.

Cyberbullying perpetration. In order to examine whether the unique variables of cyberbullying—namely anonymity, the publicity of the event, perceived victim distress, and whether the event occurred without provocation—predicted the outcome of cyberbullying perpetration, a hierarchical multiple regression was conducted. Anonymity was tested through the use of dummy coding (friend v. person known from school, friend v. person known from community, friend v. person known online, friend v. anonymous person). Level of publicity was taken from dummy coding participants' self-reports of how public the event was (private v. semi-privately, private v. publicly, private v. multiple venues). Level of perceived victim distress was taken from participants' ratings of how much distress they believed the victim experienced from the cyberbullying incident. Whether the event occurred without provocation was taken from the question, "Do you feel that the target did something to provoke initiate this behaviour/response from you?" with response options being binary (yes/no). Four models were tested: Model 1 (anonymity of the event), Model 2 (anonymity + publicity), Model 3 (anonymity + publicity + perceived victim distress), and Model 4 (anonymity + publicity + perceived victim distress + level of provocation).   The regression equations were not significant for any model, Model 1: $R^2 = .03$, adjusted $R^2 = -.05$, $F(4, 53) = 0.36$, $p = .833$; Model 2: $R^2 = .05$, adjusted $R^2 = -.08$, $F(7, 50) = 0.40$, $p = .898$; Model 3: $R^2 = .07$, adjusted $R^2 = -.08$, $F(8, 49) = 0.48$, $p = .864$; Model 4: $R^2 = .09$, adjusted $R^2 = -.08$, $F(9, 48) = 0.52$, $p = .850$. In addition, no predictors were found to be significant in any model. In total, 58 participants contributed data to the predictor and outcome variables.

Follow-up analyses were conducted in order to determine whether assumptions underlying this statistical test were violated. The Durbin-Watson case statistic was 2.01, suggesting that errors in the model were independent of each other. All VIF values were well below 10 (range: 1.09 – 1.80) and all tolerance statistics were well above 0.2 (range: 0.56 – 0.92), indicating a lack of multicollinearity in the data. Three statistics were used to examine for influential cases in the model: Cook's distance, leverage values, and Mahalanobis distances. The Cook's distance statistic indicated that no cases were greater than 1, suggesting that there were

no influential cases in the overall sample utilizing this statistic. Fourteen cases were found with leverage values greater than 0.172[24], indicating that there were a significant number of cases with above-average leverage values. Mahalanobis distances greater than 16.92[25] were flagged; in the current sample, three cases were found to have values in excess of the critical value. Covariance ratios below -0.483 and greater than 1.517[26] were noted; in the current sample, 10 cases were greater than the upper bound while none fell below the lower bound. Taken together, these findings suggest that there were several influential cases in the overall model.

Examination of scatterplots indicated that the data violated the assumptions of linearity and homogeneity of variance, in that the distribution of scores did not appear to be random and the P-P plot of the standardized residual was not linear. As these assumptions were violated, a robust multiple regression model was calculated, utilizing bootstrapping with 1,000 samples and bias-corrected and accelerated confidence intervals. In the robust regression, none of the predictors significantly predicted the outcome of participants' cyberbullying perpetration score. Due to insufficient sample size, subscale analyses were not conducted.

Testing the I^3 Model as an Explanatory Framework for Cyberbullying

The final hypothesis tested the I^3 Model as an explanatory framework for understanding cyberbullying behaviours among university students. Specifically, moderation analyses tested for the presence of instigating (Internet addiction, as measured by the IAT), impelling (proactive aggression, as measured by the RPQ), and inhibiting (high levels of subjective well-being, as measured by the SWLS) forces on cyberbullying victimization and perpetration total scores, moderated by gender. In all, six models moderated by gender were tested: Model 1 (IAT on CDBQ–V), Model 2 (RPQ proactive subscale on CDBQ–V), Model 3 (SWLS on CDBQ–V), Model 4 (IAT on CDBQ–P), Model 5 (RPQ proactive subscale on CDBQ–P), and Model 6 (SWLS on CDBQ–P). Data were analyzed using PROCESS version 2.16 (Hayes, 2013).

As can be seen on Table 4-13, four of the six models were significant; Models 3 and 6, testing the relationship between subjective well-being and cyberbullying victimization and perpetration, were non-significant. However, none of the interaction terms were significant for any model, suggesting that the relationships between the independent and dependent variables

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[24] Based on Field's (2014) guidelines, average leverage values are defined as $(k + 1)/n$, where k is equal to the number of predictors and n is the number of participants. In the current case, there were 9 predictors and 58 participants, which would lead to a value of 0.172.
[25] Based on a chi-square distribution with 9 degrees of freedom, $p < .05$ (critical values provided by Field, 2014).
[26] Boundaries calculated as per Field's (2014) instructions. Upper bound: $1 + [3(k + 1)/n] = 1.517$; lower bound: $1 - [3(k + 1)/n] = -0.483$.

were not moderated by gender. However, there were several noteworthy findings when examining gender on each set of relationships. In Model 1, there was a non-significant positive relationship for males between Internet addiction and cyberbullying victimization, $b = 0.285$, 95% CI [–0.052, 0.622], $t = 1.66$, $p = .097$. For females, there was a significant positive interaction between Internet addiction and cyberbullying victimization, $b = 0.299$, 95% CI [0.093, 0.506], $t = 2.85$, $p = .004$. In Model 2, there was a significant positive relationship for males between proactive aggression and cyberbullying victimization, $b = 3.693$, 95% CI [1.418, 5.969], $t = 3.19$, $p = .001$. For females, there was a non-significant positive relationship between proactive aggression and cyberbullying victimization, $b = 1.205$, 95% CI [–0.265, 2.674], $t = 1.61$, $p = .107$. In Model 3, there was a non-significant negative relationship for males between SWB and cyberbullying victimization, $b = –0.315$, 95% CI [–0.761, 0.131], $t = –1.39$, $p = .166$. For females, there was a significant negative relationship between SWB and cyberbullying victimization, $b = –0.255$, 95% CI [–0.510, –0.001], $t = –1.97$, $p = .049$.

In Model 4, there was significant positive relationship for males between Internet addiction and cyberbullying perpetration, $b = 0.635$, 95% CI [0.07, 1.19], $t = 2.24$, $p = .026$. For females, there was significant positive relationship between Internet addiction and cyberbullying perpetration, $b = 0.157$, 95% CI [0.052, 0.262], $t = 2.95$, $p = .003$. In Model 5, there was a significant positive relationship for males between proactive aggression and cyberbullying perpetration, $b = 4.636$, 95% CI [0.407, 8.865], $t = 2.16$, $p = .031$. For females, there was a significant positive relationship between proactive aggression and cyberbullying perpetration, $b = 0.945$, 95% CI [0.045, 1.845], $t = 2.06$, $p = .039$. In Model 6, there was a non-significant positive relationship for males between SWB and cyberbullying perpetration, $b = 0.336$, 95% CI [–0.449, 1.122], $t = 0.843$, $p = .400$. For females, there was a non-significant negative relationship between SWB and cyberbullying perpetration, $b = –0.103$, 95% CI [–0.234, 0.028], $t = –1.54$, $p = .125$.

Chapter Summary

This chapter reviewed the results of the statistical analyses employed to test the hypotheses set out in Chapter Three. The survey response and completion rates suggest that participation was lower than expected, as compared to previous studies with similar populations. Assumption testing of the data indicated that the data were non-normally distributed; however, a rationale was put forward for the use of parametric tests, complemented by robust analytic methods, to reduce data bias. Each of the seven hypotheses were tested statistically, providing

various levels of support for the hypotheses. The following chapter will discuss the results and seek to interpret the findings based on current knowledge about bullying and cyberbullying within the literature.

Table 4-13. *Moderation Analyses for Cyberbullying Victimization (Models 1–3) and Cyberbullying Perpetration (Models 4–6).*

Model	R^2	F		b	SE B	t	p
1	.072	(3, 283) = 3.86**					
			Constant	10.18 [8.79, 11.58]	0.71	14.36	.000
			Internet addiction (centred)	0.295 [0.12, 0.47]	0.09	3.29	.001
			Gender (centred)	−0.91 [−4.99, 2.59]	1.77	−0.51	.610
			Internet addiction X Gender	0.01 [−0.38, 0.41]	0.20	0.07	.942
2	.155	(3, 317) = 4.36**					
			Constant	10.17 [8.92, 11.42]	0.63	16.01	.000
			Proactive aggression (centred)	1.96 [0.72, 3.19]	0.63	3.12	.002
			Gender (centred)	0.14 [−2.55, 2.83]	1.37	0.10	.919
			Proactive aggression X Gender	−2.48 [−5.20, 0.22]	1.38	−1.81	.072
3	.027	(3, 286) = 2.30ns					
			Constant	9.95 [8.55, 11.35]	0.71	14.01	.000
			Subjective wellbeing (centred)	−0.27 [−0.49, −0.05]	0.11	−2.41	.016
			Gender (centred)	−1.10 [−4.56, 2.34]	1.75	−0.63	.527
			Subjective wellbeing X Gender	0.06 [−0.45, 0.57]	0.26	0.23	.821
4	.197	(3, 273) = 4.58**					
			Constant	4.77 [3.74, 5.80]	0.52	9.09	.000
			Internet addiction (centred)	0.28 [0.12, 0.46]	0.09	3.32	.001
			Gender (centred)	−2.65 [−6.04, 0.75]	1.72	−1.53	.125
			Internet addiction X Gender	−0.48 [−1.05, 0.09]	0.29	−1.65	.099
5	.496	(3, 290) = 3.29*					
			Constant	4.45 [3.71, 5.19]	0.37	11.84	.000
			Proactive aggression (centred)	1.99 [0.63, 3.34]	0.69	2.88	.004
			Gender (centred)	−0.81 [−2.70, 1.07]	0.96	−0.85	.396
			Proactive aggression X Gender	−3.69 [−8.01, 0.63]	2.19	−1.68	.094
6	.041	(3, 278) = 2.19ns					
			Constant	4.95 [3.65, 6.25]	0.66	7.52	.000

Subjective wellbeing (centred)	0.02 [−0.22, 0.26]	0.12	0.18	.859
Gender (centred)	−3.52 [−7.79, 0.75]	2.17	−1.62	.106
Subjective wellbeing X Gender	−0.44 [−1.24, 0.36]	0.40	−1.08	.278

Notes. [ns] non-significant, [*] $p < .05$, [**] $p < .01$, [***] $p < .001$.

Chapter Five: Discussion

This chapter discusses the results from Chapter Four and interprets them through the current literature on cyberbullying. Each hypothesis was evaluated in terms of whether evidence was found to support its claims, the strength of the evidence presented, and whether these findings support or disconfirm our existing knowledge regarding cyberbullying. This chapter also considers the particular limitations of the current endeavour, including its limited generalizability due to sampling and design, and proposes several recommendations for future studies on this topic. Finally, this chapter closes by examining the unique contributions of the current project to the larger literature base on cyberbullying.

Evaluation of Hypothesis 1

The first hypothesis postulated that cyberbullying victimization and perpetration would be a common occurrence among postsecondary students, occurring in greater than 10% of the sample within the past 12 months. In addition, it was postulated that specific types of cyberbullying behaviours—specifically flaming, harassment, and denigration—would be most common among victims. As well, females were expected to report higher rates of cyberbullying victimization than males, in line with previous research that found such differences (Kowalski & Limber, 2007; Sourander et al., 2010).

The data indicated that cyberbullying victimization (84.70%) and perpetration (70.63%) were very common among this sample over the preceding 12-month period, providing evidence for the first part of this hypothesis. Overall, no associations were found between gender and cyberbullying victimization or perpetration rates, suggesting that males and females experienced cyberbullying at the same rates. This finding is in contrast to other studies that have reported that females were significantly more likely to have been cyberbullied (e.g., Kowalski & Limber, 2007; Sourander et al., 2010). Some researchers (e.g., Genta et al., 2010) have posited that the medium used may be more useful for detecting differences in cyberbullying between males and females; however, as previously argued, the high level of integration of media may make this line of investigation redundant. However, the current study did find gender differences are present when examining subtypes of cyberbullying. While no associations were found between gender and cyberbullying victimization, males were significantly more likely to cyberbully others through flaming (OR = 1.97) and harassment (OR = 2.30), while females were significantly more likely to cyberbully others through social exclusion (OR = 3.15). In addition, chi-square analyses suggested a possible association that indicated males were more likely to

engage in impersonation as a cyberbullying strategy; however, greater cell sizes were needed to test this association. It is interesting to note that denigration was not as common a form of cyberbullying behaviour as hypothesized; however, the spreading of rumours may be considered as too juvenile a form of cyberbullying that may be more common among younger children. Indeed, Naylor (2011) suggested that bullying becomes more covert and complex as humans develop; therefore, the questions on the CDBQ may not have been adequate to detect more covert forms of rumour-spreading.

When examining differences at the item level, males were significantly more likely to be cyberbullied through harassment (trolling, being threatened online) and impersonation (having their social media account hacked). Females also differed significantly from males on two items pertaining to harassment (receiving unwanted sexual messages, receiving unwanted sexual pictures and/or videos); however, these findings suggest that the category of "harassment" may be too broad to capture nuanced differences between specific cyberbullying behaviours and gender. For instance, future iterations of the CDBQ should consider including subcategories of harassment, including sexual harassment and criminal (i.e., uttering threats) harassment. Further refinement of the current instrument would therefore increase its utility for future studies.

When examining perpetration, it is interesting to note the restriction in range in responses from female participants. For instance, Table 4-5 reflects that females in the current sample never engaged in certain types of impersonation, sharing intimate pictures or videos of a former partner, or threatening someone's life online. This suggests that females are more likely to engage in other forms of cyberbullying behaviours, such as social exclusion, and that additional items may have to be generated for the CDBQ to more accurately capture females' experiences of and engagement in cyberbullying.

In summation, partial evidence was found for the first hypothesis: Cyberbullying victimization and perpetration rates suggest that cyberbullying was a common occurrence for students in the current sample. Specific forms of cyberbullying behaviours were important for perpetration, but not for victimization. Finally, females did not significantly differ from males in terms of the amount of cyberbullying victimization.

Evaluation of Hypothesis 2

The second hypothesis postulated that evidence would not be found for the inverted-U hypothesis of cyberbullying—that cyberbullying is lower during the early school years, increases to its highest point during late middle to beginning secondary school, and decreases towards the

end of secondary school (Dooley et al., 2009). Based on the findings reported, evidence in favour of the inverted-U hypothesis of cyberbullying was not found. Overall, only 15.30% of current participants had not experienced cyberbullying victimization over the preceding 12 months, and only 29.37% had not perpetrated cyberbullying in that same timeframe. Given that the majority of participants in the sample were undergraduate students, the inverted-U hypothesis would predict low levels of cyberbullying behaviours in this group. The data, however, tell a different story. Like most other studies in the area of victimization research, the distribution of scores for both victimization and perpetration are skewed, suggesting that a majority of participants only experienced or engaged in a handful of cyberbullying behaviours. However, other studies have demonstrated that repetition is not a sufficient indication of cyberbullying severity (Kota et al., 2014); therefore, these few instances may still be the cause of great distress for the victims.

In addition, the rates of cyberbullying victimization and perpetration in the current study are significantly higher than those reported from other secondary (Beran et al., 2015; Kowalski et al., 2014) and postsecondary (Aricak, 2009; Wensley & Campbell, 2012) samples. While rates are naturally inflated due to the use of a 12-month period (Ybarra, 2013), rates are still high compared to other studies involving postsecondary students. As previously noted, Faucher and colleagues (2014) reported a 12-month cyberbullying victimization rate of 24.1%; the current study estimated a rate of 84.7% over the same time period. The reason for this discrepancy is unclear; however, one possible explanation may lie in the fact that Faucher and colleagues' rates of cyberbullying were significantly lower due to defining cyberbullying at the beginning of their survey. Providing a definition may limit the types of behaviours considered by respondents to equate cyberbullying through limiting the definitional boundaries of what constitutes cyberbullying. For instance, the definition provided by Faucher and colleagues focused exclusively on the criterion of harm, without consideration of the other definitional components of bullying or cyberbullying. The use of such a limited definition may therefore reflect the lower reporting rate of cyberbullying in that study as compared to the present study.

Note as well that the rate of victimization in the current study (84.7%) is almost identical to that of the 2016 study by Doane and colleagues (84.9%), indicating some agreement with other 12-month studies assessing cyberbullying among postsecondary students. In both of these studies, cyberbullying behaviours were queried without the provision of a definition of cyberbullying. In addition, the measurement of cyberbullying in these studies was guided by

grouping behaviours into theoretically-derived[27] taxonomies, rather than using a checklist of behaviours purported to be part of the construct of cyberbullying. Reliance on theory to guide instrument development may therefore also account for greater sensitivity to detecting cyberbullying victimization as compared to Faucher and colleagues' (2014) study.

Taken in sum, the findings of the current study do not support an inverted-U hypothesis for cyberbullying, based on the high rates of cyberbullying perpetration and victimization at the postsecondary level. In addition, the frequencies of cyberbullying perpetration and victimization suggest that it remains a common occurrence in the lives of many university students.

Evaluation of Hypothesis 3

The third hypothesis postulated that traditional bullying behaviours would reflect complex development, moving from physical aggression to relying on acts of social and verbal aggression. However, gender differences were expected in that males would be more likely to engage in physical aggression, while females would be more likely to engage in social (direct and indirect) forms of aggression (Bartol & Bartol, 2014; Dilmac, 2009).

In terms of traditional bullying victimization, males were significantly more likely to be bullied through physical aggression (OR = 2.24), while females were more likely to be bullied through indirect social aggression (OR = 1.67). Mean differences on the BBPS–V suggested that males were more likely to report having been hit, threatened, and blackmailed. While female participants' mean scores did not differ significantly from those of their male counterparts, it is worthwhile to note that these two groups reported similar levels of indirect social aggression.

No significant associations were found between gender and the type of aggression (e.g., physical, verbal, direct social, indirect social) used to bully others. However, mean differences on the BBPS–P indicated that males were more likely to engage in verbal aggression, while no differences were found between males and females on items pertaining to physical, direct social, and indirect social aggression. The finding that males were more likely to engage in verbal aggression is in contrast to the postulated hypothesis, but is in line with developmental research which states that bullying behaviours become more complex throughout the course of human development (Naylor, 2011). In retrospect, given the population under investigation— university-educated young adults—a more appropriate hypothesis would have taken this developmental trajectory into account. It is, however, interesting to note that males self-reported

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[27] Doane and colleagues (2016) also relied on factor analysis for the grouping of their items; Faucher and colleagues (2014) did not.

significantly greater levels of physically aggressive acts directed at themselves, providing evidence that physical aggression is still common among this age group. An oversight of the survey is that the current study did not inquire into the gender of the perpetrator; as such, it is impossible to state whether physical aggression is perpetrated by males towards other males; future studies should address this limitation.

It is also worthwhile noting areas where no gender differences were found between males and females. For instance, no differences were found between these two groups when examining items related to social exclusion, indicating that males and females in the current sample socially excluded another person at least once a week. This finding is in line with developmental research regarding the use of more complex forms of bullying in later developmental stages, but also speaks to how common this bullying strategy is employed among university students. Future research regarding the reasons for social exclusion among university students may be important to better understand how bullying functions at the postsecondary level.

Evaluation of Hypothesis 4

The fourth hypothesis postulated that cyberbullying would not be a unique construct separate from proactive aggression and traditional bullying, evidenced by moderate to strong correlations between these constructs. Moderate correlations were found between proactive aggression, cyberbullying perpetration ($R^2 = .168$), and traditional bullying perpetration ($R^2 = .129$), providing evidence for the interrelatedness of these constructs. In addition, moderate to large correlations were found between cyberbullying victimization, cyberbullying perpetration ($R^2 = .448$), traditional bullying victimization ($R^2 = .336$), and traditional bullying perpetration ($R^2 = .230$).

Note, however, the impact of gender on the magnitude of correlation coefficients when examining aggression and other variables of interest. For females, non-significant relationships were found between proactive aggression and cyberbullying victimization ($R^2 = .014$) and proactive aggression and traditional bullying victimization ($R^2 = .008$); however, proactive aggression was found to significantly correlate with traditional ($R^2 = .062$) and cyberbullying ($R^2 = .057$) perpetration. For males, proactive aggression was found to be significantly associated with traditional bullying victimization ($R^2 = .230$) and perpetration ($R^2 = .230$), as well as cyberbullying victimization ($R^2 = .260$) and perpetration ($R^2 = .292$). These findings suggest that, in the current sample, proactive aggression is lower in females than in males.

This finding is not unexpected, especially because females tend to engage in more

indirect forms of aggression (Kowalski et al., 2014; Dilmac, 2009)—something that is not necessarily captured well in the RPQ. When comparing the RPQ to Underwood's (2003) typology, it is evident that the items in this scale focus on verbally and physically aggressive acts, to the complete exclusion of social and relational forms of aggression. While studies have found that the RPQ two-factor structure does not change depending on gender (Baker et al., 2008; Cima, Raine, Meesters, & Popma, 2013; Pechorro, Kahn, Ray, Raine, & Abrunhosa Gonçalves, 2017), no definitive answer has been provided as to the differences in aggressive tactics employed by males and females. It is possible that the reason for these equivocal findings is largely in part due to inadequate construct representation by focusing primarily on physical and verbal aggression. Future studies should examine the impact of greater construct coverage in instruments measuring proactive and reactive aggression.

Despite these findings, the evidence found within the current study indicates that the constructs of aggression, bullying, and cyberbullying are meaningfully interrelated, providing evidence that cyberbullying is not unique from these other constructs.

Evaluation of Hypothesis 5

The fifth hypothesis stated postulated that cyberbullying would not meet the threshold of traditional bullying, evidenced through poor model fit based on the differential impacts of repetition, intent to harm, and imbalance of power on participants' cyberbullying victimization (CDBQ–V) and perpetration (CDBQ–P) scores. Relying on hierarchical regression utilizing bootstrapping with 1,000 samples and bias-corrected and accelerated confidence intervals, results indicated that only repetition and intent to harm were significant predictors of a participant's total cyberbullying victimization score. Specifically, repetition was found to be significant for participants who reported being cyberbullied at least once a month or at least once a week in the uncorrected model, while being cyberbullied at least once a day was significant in the bootstrapped model.

Additionally, participants' ratings of how much distress the perpetrator intended the victim were found to be significant in predicting a participant's cyberbullying victimization score in the uncorrected model; this relationship did not hold in the bootstrapped model. Across both models, no evidence was found to substantiate the importance of a power differential, evidenced through ratings of popularity, physical strength, intelligence, and technological abilities. Evidence, therefore, was only found for repetition being a significant predictor for cyberbullying victimization within the current sample. Note, however, that missing data led to only 66

participants within the overall study being used to conduct analyses. In addition, definitional issues could also have impacted the results. Specifically, repetition was coded based on participants' highest reported frequency of cyberbullying victimization, which may have inflated the global cyberbullying rates reported by participants. In addition, intent to harm was based on participants' ratings of how much harm the perpetrator intended to inflict on them—a subjective task further complicated by being unable to establish intent from the perpetrator's perspective. Finally, the model that accounted for the most variance could only explain 33% of the variance in cyberbullying victimization scores to the linear combination of the predictors, indicating that 67% of the variance in scores was attributable to other factors. This finding may indicate that the survey questions and response formats were not set up to accurately measure the definitional components, or that vital definitional components were missing from our measurements.

In regards to cyberbullying perpetration, cyberbullying others at least once a week was the only significant predictor of participants' total cyberbullying score in the uncorrected model; no predictors were significant in the bootstrapped model. Similar to the limitations above, a small sample size, coupled with definitional issues, may be partly responsible for null results. Finally, the model that accounted for the most variance could only explain 36% of the variance in cyberbullying perpetration scores to the linear combination of the predictors, indicating that 64% of the variance in scores was attributable to other factors. This finding again indicates either a lack of measurement specificity or a lack of critical definitional components not accurately captured in this study.

It is interesting to note that intentionality was not found to be a significant predictor in the current endeavour, especially due to its centrality in theoretical conceptualizations of bullying. Gibb and Devereaux (2016) found that repetition and intent were found to be significant indicators in their measurement of cyberbullying among college students, thus providing evidence for cyberbullying being related to traditional bullying. However, it is also important to note that establishing intent to harm is impossible without corroboration from the perpetrator. As such, it is important to consider alternate methods of measuring intent in order to better understand how (and if) cyberbullying differs from traditional bullying, such as measuring intent and perceived distress in actual perpetrator-victim dyads.

The current study also attempted to measure the presence of a power differential by examining physical strength, technological prowess, social standing, and intelligence as possible indicators of such a difference. It is interesting that none of these items were found to predict

cyberbullying victimization or perpetration scores, indicating that future studies should consider operationalizing power differentials differently in order to capture the online context in a more ecologically valid manner. Alternatively, the results could indicate that the online world is the "great equalizer," providing opportunities for anyone to assert their dominance. The second conclusion is supported by Law and colleagues' (2012) findings, which indicated that participants' aggressive acts online were not differentiated between reactive and proactive reasons for aggressing. Cyberbullying, therefore, may not be dependent on the need for a power differential in order to predict an aggressive interaction; instead, a more theoretically useful approach may be to look at the interactions between instigating, impelling, and inhibiting forces in predicting aggressive events, rather than specific definitional components related to the act.

While remaining mindful of the limitations expressed regarding the measurement of this hypothesis, the current study found that cyberbullying did not meet the threshold of traditional bullying, as evidenced by the importance of repetition, but not intent or the presence of a power differential, as predictor for cyberbullying victimization.

Evaluation of Hypothesis 6

The sixth hypothesis postulated that the unique features of cyberbullying—including anonymity, how public the event is, perceived victim distress, and whether the event occurred without provocation—would be predictive of cyberbullying victimization and perpetration. The publicity of the event was hypothesized to be a significant predictor, while anonymity was not thought to be a significant predictor. The results indicated that the unique features of cyberbullying were not significant in predicting victimization scores across four different models. Specifically, the only predictor found to be significant in regards to cyberbullying victimization was perceived victim distress, although the models associated with this predictor were not significant.

For cyberbullying perpetration, none of the models, as well as none of the predictors, proved to be significant in predicting participants' self-reported levels of cyberbullying perpetration. However, it should be noted that only 58 participants contributed data towards the predictor and outcome variables, which decreased the robustness of this statistical test. It is interesting, however, that these unique variables failed to significantly predict cyberbullying perpetration or victimization, especially considering that other studies have found these variables to be predictive. For example, Pieschl and colleagues (2015) found that the more public an event was, the greater the level of self-reported distress. It is possible that the difference in results are

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due to the age of the samples (e.g., middle school v. university), and that developmentally, university students have more cognitive and social resources to cope with incidents of cyberbullying.

Evaluation of Hypothesis 7

The final hypothesis in this study was that gender would be found as a moderator for the relationships between instigating, impelling, and inhibiting forces in cyberbullying victimization and perpetration. This was tested by examining the impact of Internet addiction (instigating trigger), proactive aggression (impelling force), and subjective wellbeing (SWB; inhibiting force) on cyberbullying victimization and perpetration. While all but two of the models produced significant results overall, none of the interactions between gender and the specified variables were significant, indicating that gender may not have been a meaningful moderator variable. This in turn suggests that gender is not predictive of cyberbullying victimization and perpetration based on the variables of Internet addiction, proactive aggression, and SWB, and provides additional evidence that the role of gender may not have global ramifications for cyberbullying victimization or perpetration.

Some evidence, however, was garnered for the utility of the predictor variables on both cyberbullying victimization and perpetration. In regards to Internet addiction, females with higher scores on the IAT were significantly more likely to have been cyberbullied. In addition, both males and females with higher IAT scores were also more likely to have perpetrated cyberbullying. This finding confirms what has been found in other studies (e.g., Jung et al., 2014)—namely, that problematic Internet use serves as a situational force that may increase the likelihood of cyberbullying incidents. Future studies should focus on the measurement of additional instigators. For instance, a recent review of ostracism provides evidence that ostracism leads to aggression (Ren, Wesselmann, & Williams, 2017), providing a useful framework for understanding why (and how) cyberbullying victimization leads to cyberbullying perpetration. Ostracism as a potential instigating trigger should be explored in future studies.

Evidence was also found for proactive aggression as an impellor: Males with high levels of proactive aggression were significantly more likely to report cyberbullying victimization. As well, both males and females with high levels of proactive aggression were significantly more likely to report cyberbullying perpetration. If cyberbullying is, in fact a subset of bullying (and therefore a form of proactive aggression), a significant relationship is expected between these variables. The fact that gender did not moderate the relationship between cyberbullying

victimization, perpetration, and proactive aggression, provides evidence that males and females relied similarly on proactive strategies for aggressing against others. The results from the current study, therefore, supports the notion that cyberbullying is a form of proactive aggression. What remains a mystery, however, is the cognitive processes associated with cyberbullying as a form of proactive aggression. One study has examined the utility of the I^3 Model in understanding normative beliefs about aggression among university students (Li, Nie, Boardley, Dou, & Situ, 2015), which provided evidence that normative beliefs about aggression predicted aggressive behaviour in the presence of an instigating trigger in a laboratory setting. However, future studies should focus on ecologically valid (i.e., online and *in vivo*) assessments of the interactions of instigating and impelling forces, in order to better understand the cognitions associated with cyberbullying.

Results for an inhibiting force—specifically, SWB—were less compelling, as evidenced by non-significant relationships between cyberbullying victimization and perpetration and SWB. Unsurprisingly, females with low levels of SWB reported significantly higher levels of cyberbullying victimization, providing correlational evidence of the negative relationship between cyberbullying and wellbeing. Moderation analyses examining the impact of gender on the relationship between SWB and cyberbullying victimization and perpetration produced non-significant results, suggesting that SWB may not serve a protective function against involvement in cyberbullying. Given this information, evidence was not provided for SWB as an impelling force against cyberbullying perpetration.[28]

However, conceptualizing the relationship between wellbeing and cyberbullying may be more complex than this. For instance, research supports the notion that SWB is a stable trait, with little variability in life satisfaction attributable to situational factors (Eid & Diener, 2004; Fujita & Diener, 2005; Li, Yin, Jiang, Wang, & Cai, 2015; Lucas & Donnellan, 2007). While it is generally assumed that cyberbullying leads to lower levels of life satisfaction, another plausible explanation that is more consistent with the trait theory of SWB would suggest that low SWB leads to cyberbullying. Given that this study's research design cannot control for causality, it is impossible to verify whether this is the case. It is interesting to note that, for females, almost every single variable—with the exception of traditional bullying perpetration—was negatively

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[28] It is interesting to note, however, that SWB was negatively correlated with traditional bullying victimization for both males, $r(78) = -.30$, $p < .01$, and females, $r(183) = -.24$, $p < .01$, suggesting that our measurement of SWB was perhaps more sensitive to traditional instances of bullying, rather than cyberbullying *per se*. Refer to Table 10.

correlated with life satisfaction (see Table 10). This pattern of results may support a trait interpretation of the interaction of SWB with victimization. However, the same pattern of results did not hold for male participants: The only two variables negatively correlated with life satisfaction were traditional bullying victimization and Internet addiction.

It is also important to note the limitations of the current measurement of SWB. Specifically, SWB consists of three distinct components: Life satisfaction, high levels of positive affect, and low levels of negative affect (Li et al., 2015); however, the current study only measured one aspect of this construct. For the purposes of the current study, measurement of life satisfaction was thought to be a more "pure" reflection of a participant's overall satisfaction with life, as life satisfaction is not a direct measurement of emotion, but rather a cognitive evaluation of one's life (Diener, 2009). Measurement of just one component of SWB, however, may be problematic. A recent study (Li et al., 2015) found that, while SWB appears to be a trait, measurements of life satisfaction were more variable over the span of one year than measurements of positive affect and negative affect, indicating that fluctuations in terms of self-reported life satisfaction may be more common than fluctuations in positive and negative affect. Given this information, participants' ratings of life satisfaction—especially after having been primed to think about their own experiences with aggression, bullying, and cyberbullying—may have been impacted.   Future studies should correct for this limitation through measuring positive and negative affect, and utilizing randomized questionnaire section presentation to control for the impact of priming effects.

Limitations of Current Study and Future Directions

The current study is not without its limitations, attributable to issues with sampling, design, and measurement. The current study only recruited university students from one large university in Saskatchewan. In order to make the results generalizable to a wider audience, recruitment from other postsecondary institutions, including trade schools, community colleges, and private colleges, is necessary for generalization of results to all postsecondary students in Saskatchewan. In regards to issues of design, the current study relied on a cross-sectional design, limiting our results to the time at which the survey was conducted. Future studies should consider longitudinal methods in order to determine how (and whether) cyberbullying changes over time. Of particular interest would be the measurement of how cyberbullying changes at several junctures: a) at the time a child begins using social media; b) at the transition from elementary school to high school; c) at the transition from high school to postsecondary; and d)

at the transition from postsecondary into the workforce. Therefore, the use of a longitudinal cohort model may be of particular interest to cyberbullying researchers.

Our measurement of cyberbullying may have been impacted by the fact that instruments were created, but not psychometrically validated, for use in the current study. While measures of postsecondary bullying (Goldsmid & Howie, 2014) and cyberbullying (Doane, Kelley, Chiang, & Padilla, 2013) are available, they were not used in order to establish evidence for the validity or reliability of the instruments created by the thesis author. The decision to not include additional instruments—or to use alternate instruments—was largely driven by balancing the desire for rigour with the practicalities of survey response rates. In addition, the CDBQ and BBPS were not subjected to expert review, which likely impacted the quality and content of the measures, or factor analysis, leaving the overall factor structure of these measures unknown. However, both instruments were derived from theoretical models of the constructs of bullying and cyberbullying (e.g., Underwood, 2003; Willard, 2007), and contain similar content to that of other measures of bullying and cyberbullying (Calvete et al., 2010; Dredge et al., 2014; Goldsmid & Howie, 2014; Holfeld & Leadbeater, 2015; Leung & McBride-Chang, 2013; Newey et al., 2011). Future studies should examine the factor structure, as well as the content of these instruments in order to determine their utility and accuracy in encapsulating their purported constructs within a postsecondary sample. As well, the inclusion of subcategories may improve sensitivity to different forms harassment (e.g., sexual, criminal).

As previously mentioned, future measurement improvements should also focus on other instruments used in the current study. In brief, these improvements should include a more thorough measurement of proactive aggression that does not just primarily focus on physical and verbal aggression. Our findings suggest that expanding the measurement of proactive aggression to include direct and indirect social exclusion may improve the overall measurement of aggression, especially among female participants. Alternatively, measurement may be improved through the use of a measure of aggression with better psychometric properties, as well as ecological validity, for aggression among females. Future studies should also inquire as to the gender of the perpetrator, as this may allow for more thorough evaluation of gender differences in cyberbullying instances. SWB should be measured as a tripartite construct, consisting of life satisfaction, positive affect, and negative affect; future studies should also control for priming effects in reporting both victimization/perpetration and life satisfaction. Finally, in order to test a theoretical model for cyberbullying, greater attention should be paid to the inclusion of other

variables that may serve as instigating, impelling, and inhibiting forces. Focus on the measurement of specific instigators, such as social ostracism, and specific impellors, such as normative beliefs about aggression, may provide a clearer understanding of the pathway from victimization to perpetration. The use of qualitative interviews may shed light on the important factors associated with cyberbullying perpetration and victimization. Additionally, longitudinal designs may allow for a more comprehensive review of these forces by allowing researchers to see how these forces are shaped over time and across life circumstances.

Unique Contributions of Current Research

Despite the previously-stated limitations, this study provided insightful information regarding cyberbullying behaviours among university students attending a large university in Saskatchewan. In addition, this study is the second to test a novel theoretical framework for better understanding cyberbullying among university students. While gender did not moderate the variables of interest as hypothesized, this study did provide valuable information regarding the role of Internet addiction and proactive aggression as they relate to instigating triggers and impelling forces within the I^3 Model. Finally, this study is one of the first to examine all the proposed definitional components of cyberbullying in order to establish the most important definitional components of a cyberbullying event. The current research endeavour suggests that repetition is the most significant predictor of cyberbullying victimization, providing useful information in understanding this phenomenon. This research also demonstrates that there is room to improve future studies of cyberbullying through paying more attention to sampling, design, and measurement strategies, in order to improve the utility of our findings on this pressing social concern.

Chapter Summary

The focus of the current chapter was to review the results from Chapter Four and synthesize these findings based on the current knowledge regarding cyberbullying. Each hypothesis was evaluated in regards to the evidence found, the strength of the evidence found, and the meaning of these results within the larger literature on cyberbullying and aggression. The limitations of the current study were discussed, focusing primarily on concerns related to sampling, research design, and issues pertaining to the measurement of various constructs. Several proposals for future research studies were provided, including the improvement of measurement related to proactive aggression and cyberbullying. Despite these limitations, the unique contributions of the current study—including the testing of a novel framework of

aggression and examination of the critical definitional components of cyberbullying—provide new opportunities for exploration in this area of public concern.

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Facebook Recruitment Script

Dear Facebook friends,

As you may know, I am in the last year of my master's degree. Some of you also know that I have been studying the topic of cyberbullying as part of my thesis research. I'm asking for your help today in recruiting postsecondary students who live in Saskatchewan to consider taking part in my study on cyberbullying among postsecondary students in Saskatchewan. As we all know, cyberbullying is a major concern among youth, but very little research has explored how cyberbullying is impacting students at the college/university level.

Would you be willing to either a) take part in this survey, and/or b) share the link to this survey with your applicable friends? The survey should take no longer than 30 minutes, and all responses will be kept anonymous and confidential. As always, your participation is completely voluntary.

Your help is very much appreciated! If you have any questions, please don't hesitate to send me a message here or email me at john.myburgh@usask.ca This study has also been approved by the Research Ethics Boards of the University of Saskatchewan (Beh 17-92) and University of Regina (2017-059). The survey can be found at https://na1se.voxco.com/SE/90/SKpostsecondarycyberbullying/. Thanks so much for your help!

PAWS Announcement Invitation

We would like to invite you to participate in an online survey designed to ask about your perceptions and experiences of cyberbullying and bullying among postsecondary students. The survey should take between 15 to 30 minutes, and at the end, you will have an opportunity to enter your name for a draw for a $250 gift card. As well, one of the measures used in this study measures problematic Internet use. At the completion of the survey, you will receive feedback about your Internet use. Your responses will be kept completely confidential and anonymous, and your participation is voluntary.

This study has been approved by the Research Ethics Boards of the University of Saskatchewan (Beh 17-92) and University of Regina (2017-059). If you have any questions regarding any aspect of this study, please contact one of the researchers listed below.

If you are willing to participate, please click the survey link here:
https://na1se.voxco.com/SE/90/SKpostsecondarycyberbullying/

Thank you very much for your help.

For more information contact:
John-Etienne Myburgh (john.myburgh@usask.ca)
Dr. Laurie Hellsten (laurie.hellsten@usask.ca)

Email Follow-Up

To: [undisclosed recipients]

Subject: Thanks for participating in our study! (Usask Beh 17-92)

Hi there,

You had left your email address to enter a gift draw associated with our study, Perceptions of Cyberbullying among Postsecondary Students in Saskatchewan (Beh 17-92).

We just wanted to personally thank you for taking the time to complete our survey. We recognize that this survey required a substantial time commitment, and appreciate that you took the time to help our team with our research—thank you.

Because so little research has been done looking at cyberbullying and bullying in postsecondary schools, we are trying to do our best to gather a representative sample. Would you consider passing on the survey link to any friends you may have that are attending postsecondary (trade school, regional college, private college, university) in Saskatchewan? The survey can be accessed at https://na1se.voxco.com/SE/90/SKpostsecondarycyberbullying/

Your email address has been entered for the $250 cash card draw. The draw will take place at the end of August, 2017.

Again, thank you very much for helping our team learn more about cyberbullying and bullying in Saskatchewan.

Sincerely,

John-Etienne Myburgh & Dr. Laurie Hellsten

Project Name: Perceptions and Experiences of Cyberbullying among Postsecondary Students in Saskatchewan

Researchers:

John-Etienne Myburgh, M. Ed. (cand.)   john.myburgh@usask.ca
Graduate Student-Researcher
College of Education
University of Saskatchewan

Laurie Hellsten, Ph.D.
Full Professor   laurie.hellsten@usask.ca   (306) 966-7723
College of Education
University of Saskatchewan

Purpose and Procedure:
We are asking you to participate in an online survey examining your perceptions of, and experiences with, cyberbullying in a postsecondary setting. A secondary purpose of this study is to train the graduate student-researcher in the methods of behavioural research. The total time to complete the survey should take no longer than 30 minutes. The survey will consist of a series of questions about technology and Internet use, your experiences with bullying and cyberbullying as a postsecondary student, aggressive behaviours you may engage in, your current satisfaction with your life, your perceptions about yourself, and a short section of demographic questions. After the survey, a debriefing form will be provided to you. While some of the questions may ask about sensitive information, please remember that your responses will be anonymous and will only be used to help inform our research on the experiences of cyberbullying among postsecondary students. After completing the survey, you will have an opportunity to enter your name for a $250 gift card. The survey software we are using will redirect you from the original survey to enter your name into the draw; this is done so that your name and contact information will not be linked to your survey responses.

Potential Risks:
There are no known or anticipated risks associated with completing this study. However, if any part of your participation in this study has made you feel uncomfortable, distressed, or upset, we encourage you to access one of the following resources based on the institution you are attending:

- University of Saskatchewan: Student Counselling Centre (306-966-4920), located on the 3rd floor of Place Riel Student Centre.
- University of Regina: Counselling Services (306-585-4491), located on the 2nd floor of the Riddell Centre.
- (*Contact information for counselling services at other consenting postsecondary institutions will also be listed*)

In the event that your institution does not provide student counselling services, we encourage you to access one of the following resources based on your geographical location:

- (North Saskatchewan) Northeast Crisis Line: 1-800-611-6349

- Prince Albert Mobile Crisis Unit: (306) 764-1011
- Regina Mobile Crisis Services – Crisis Line: (306) 525-5333
- Saskatoon Crisis Intervention Service: (306) 933-6200
- West Central Crisis and Family Support Centre: (306) 933-6200
- National Suicide Prevention LifeLine: 1-800-273-8255
- First Nations and Inuit Hope for Wellness Line: 1-855-242-3310

Potential Benefits:
You may receive no personal benefits from participating in this study. However, one of the measures used in this study measures problematic Internet use. At the completion of the survey, you will receive feedback about your Internet use. In addition, your responses will help with the continuing study of cyberbullying within the province of Saskatchewan.

Confidentiality:
Your data will be kept completely confidential and no personally identifying information will be linked to your data. Data will be coded using arbitrary participant numbers that will not be associated with any names or personally identifying information. Consent forms will not be linked with the data. All data will be summarized in aggregate form. No identifying information will be collected. The survey software being used hosts their servers in Canada.

Storage of Data:
The data and consent forms will be stored securely at the University of Saskatchewan by the primary investigator, Dr. Laurie Hellsten, in her laboratory. The data will be securely saved and stored for a minimum of five (5) years. In instances where the data are published in an academic journal and/or presented at a professional conference, the data will be stored for a minimum of five years after completion of the study. When the data are no longer required, it will be destroyed beyond recovery.

Right to Withdraw:
Participation in this survey is voluntary, and you can decide not to participate at any time by closing your browser, or choose not to answer any questions you don't feel comfortable with. Survey responses will remain anonymous. Since the survey is anonymous, once it is submitted it cannot be removed.

Follow-Up:
To obtain results from this study, please contact one of the researchers listed above after September 01, 2017. In addition, your postsecondary institution may have requested a formal presentation from the researchers in regards to the results of this project—please contact the researchers to inquire whether your institution will be hosting such an event.

Questions:
This project was reviewed on ethical grounds by the Research Ethics Boards of the University of Saskatchewan and the University of Regina. Any questions regarding your rights as a participant may be addressed to that committee through the Research Ethics Office at ethics.office@usask.ca or (306) 966-2975. Out-of-town participants may call toll-free at (888) 966-2975.

If you are interested in learning more about this study, please contact one of the researchers listed,

through the contact information provided above.

Consent to Participate:
Please note that completing and submitting this questionnaire will constitute your consent to participate in this study and for the researchers to use the data gathered in the manner described above. Do you wish to participate in this study?

YES   NO

Appendix C: Debriefing Information

Thank you very much for your participation in this study. Through completing this survey, you are helping us to find out more about how cyberbullying is impacting postsecondary students in Saskatchewan. While many studies have shown how widespread cyberbullying is among primary and secondary students, very little attention has been paid to how cyberbullying is impacting university students. Because of the negative impacts that cyberbullying has on academic achievement and mental health, it is more important than ever to find ways to help address this growing concern. Your participation in this study is one way to help further knowledge about how cyberbullying is impacting our students here in Saskatchewan. Thank you for your help!

If any part of your participation in this study has made you feel uncomfortable, distressed, or upset, we encourage you to access one of the following resources based on the institution you are attending:

- University of Saskatchewan: Student Counselling Centre (306-966-4920), located on the 3rd floor of Place Riel Student Centre.
- University of Regina: Counselling Services (306-585-4491), located on the 2nd floor of the Riddell Centre.
- (*Contact information for counselling services at other consenting postsecondary institutions will also be listed*)

In the event that your institution does not provide student counselling services, we encourage you to access one of the following resources based on your geographical location:

- (North Saskatchewan) Northeast Crisis Line: 1-800-611-6349
- Prince Albert Mobile Crisis Unit: (306) 764-1011
- Regina Mobile Crisis Services - Crisis Line: (306) 525-5333
- Saskatoon Crisis Intervention Service: (306) 933-6200
- West Central Crisis and Family Support Centre: (306) 933-6200
- National Suicide Prevention LifeLine: 1-800-273-8255
- First Nations and Inuit Hope for Wellness Line: 1-855-242-3310

We have taken the utmost care to conduct this study in the most ethical manner possible. In addition, this study has been approved by the Research Ethics Boards of the University of Saskatchewan and the University of Regina. However, if any aspect of this study has caused you unease, or if you would like to express your concerns about any aspect of how this study was conducted, please do not hesitate to contact the committee through the Research Ethics Office at ethics.office@usask.ca or (306) 966-2975. Out-of-town participants may call toll-free at (888) 966-2975.

If you are interested in learning more about this study, please contact one of the researchers listed, through the contact information provided above.

If you are interested in the results of this study, please do not hesitate to contact one of the researchers listed below for a summary of our findings. Our full report is expected to be

available in September 2017.

John-Etienne Myburgh   john.myburgh@usask.ca
Dr. Laurie Hellsten   laurie.hellsten@usask.ca

Thank you again for participating in this study!

Appendix D: Demographics Questionnaire

This survey is open to postsecondary students who are attending a Saskatchewan postsecondary institution (e.g., university, trade school, regional college, private college). The following examples can be used to determine whether you are considered a postsecondary student for the purposes of this study:

- *You have completed at least one semester of postsecondary studies and are planning on returning for the next semester;*
- *You are enrolled on a part-time or full-time basis at a postsecondary institution;*
- *You have completed your postsecondary coursework but have not received your degree;*
- *You are an apprentice in a trades program but have not completed your coursework.*

1. Are you currently a student attending a postsecondary institution (e.g., university, college, trade school) in Saskatchewan?
    Y / N [*IF "No," participant was screened out and thanked for their participation*]

2. Which institution are you attending?
    ☐ University of Saskatchewan
    ☐ University of Regina
    ☐ Saskatchewan Polytechnic
    ☐ Gabriel Dumont Institute
    ☐ Saskatchewan Indian Institute of Technologies
    ☐ Carlton Trail College
    ☐ Cumberland College
    ☐ Great Plains College
    ☐ Lakeland College
    ☐ Northlands College
    ☐ North West College
    ☐ Parkland College
    ☐ Southeast College
    ☐ Other (please specify):_____

3. What type of program are you currently attending?
    ☐ Apprenticeship (e.g., journeyperson trades program)
    ☐ Certificate
    ☐ Diploma
    ☐ Bachelor degree
    ☐ Master's degree
    ☐ Doctoral degree
    ☐ Other (please specify):_____

4. How many years of postsecondary education have you completed?
   - [ ] Less than 1
   - [ ] 1
   - [ ] 2
   - [ ] 3
   - [ ] 4
   - [ ] 5+

5. In what year were you born?

6. Were you born in Canada?
   - [ ] Yes   [ ] No

7. [*If "No" to Q6, participants were shown Q7*]: If you were NOT born in Canada, how long have you lived in Canada?
   - [ ] Less than 1 year
   - [ ] 1 to 2 years
   - [ ] 3 to 4 years
   - [ ] 5 years or more

8. What is your gender?
   - [ ] Male
   - [ ] Female
   - [ ] Transgender (MTF)
   - [ ] Transgender (FTM)
   - [ ] Other

9. [*If "Other" for Q8, participants were shown Q9*]: For the previous question regarding gender, you selected "Other." Please tell us how you describe yourself:

10. What is your ethnicity?
    - [ ] Aboriginal (e.g., First Nations, Métis, Inuit)
    - [ ] Black (e.g., African, African American, African Canadian, Caribbean)
    - [ ] East Asian (e.g., Chinese, Japanese, Korean, Polynesian)
    - [ ] Latin American (e.g., Mexican, Indigenous Central and South American)
    - [ ] South Asian (e.g., Indian, Pakistani, Sri Lankan, Bangladeshi)
    - [ ] Southeast Asian (e.g., Burmese, Cambodian, Filipino, Laotian, Malaysian, Thai, Vietnamese)
    - [ ] West Asian (e.g., Arabian, Armenian, Iranian, Israeli, Lebanese, Palestinian, Syrian, Turkish)
    - [ ] White/Caucasian/European
    - [ ] Other

11. [*If "Other" for Q10, participants were shown Q11*]: For the previous question regarding ethnicity, you selected "Other." Please tell us how you describe yourself:

12. What is your current relationship status?
- [ ] Single (dating)
- [ ] Single (not dating)
- [ ] In a relationship
- [ ] Common-law/married
- [ ] Divorced
- [ ] Widowed
- [ ] Other (please specify):_____

13. What is your religious orientation?
- [ ] Christian
- [ ] Muslim
- [ ] Hindu
- [ ] Jewish
- [ ] Buddhist
- [ ] Atheist
- [ ] Agnostic
- [ ] I don't know
- [ ] Other

14. [*If "Other" for Q13, participants were shown Q14*]: For the previous question regarding religious orientation, you selected "Other." Please tell us how you describe yourself:

15. What is your sexual orientation? Generally, do you identify as:
- [ ] Exclusively gay/lesbian
- [ ] Primarily gay/lesbian
- [ ] More gay/lesbian than heterosexual
- [ ] Bisexual
- [ ] More heterosexual than gay/lesbian
- [ ] Primarily heterosexual
- [ ] Exclusively heterosexual
- [ ] Don't know
- [ ] I prefer not to use labels
- [ ] Queer
- [ ] Other

16. *If "Other" for Q15, participants were shown Q16*]: For the previous question regarding sexual orientation, you selected "Other." Please tell us how you describe yourself:

Appendix E: Technology Use Questionnaire

1. Which social media platform do you use most often to communicate with your friends?

2. How often do you use [*answer from Q1*] to communicate with your friends?
   - ☐ Several times a day
   - ☐ A few times a day
   - ☐ Once or twice a day
   - ☐ A few times a week
   - ☐ Once or twice a week
   - ☐ A few times a month
   - ☐ Once or twice a month
   - ☐ A few times a year

3. Within the past year, have you used any of the following social media platforms? Check all that apply:

	Several times a day	A few times a day	Once or twice a day	A few times a week	Once or twice a week	A few times a month	Once or twice a month	A few times a year	Never use
Ask.fm	☐	☐	☐	☐	☐	☐	☐	☐	☐
Burn Note	☐	☐	☐	☐	☐	☐	☐	☐	☐
Blendr	☐	☐	☐	☐	☐	☐	☐	☐	☐
Chatroulette	☐	☐	☐	☐	☐	☐	☐	☐	☐
Facebook	☐	☐	☐	☐	☐	☐	☐	☐	☐
Hot or Not	☐	☐	☐	☐	☐	☐	☐	☐	☐
Instagram	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kik	☐	☐	☐	☐	☐	☐	☐	☐	☐
LinkedIn	☐	☐	☐	☐	☐	☐	☐	☐	☐
MeetMe	☐	☐	☐	☐	☐	☐	☐	☐	☐
MyLOL	☐	☐	☐	☐	☐	☐	☐	☐	☐
Omegle	☐	☐	☐	☐	☐	☐	☐	☐	☐
ooVoo	☐	☐	☐	☐	☐	☐	☐	☐	☐
Poke	☐	☐	☐	☐	☐	☐	☐	☐	☐
Reddit	☐	☐	☐	☐	☐	☐	☐	☐	☐
Shots of Me	☐	☐	☐	☐	☐	☐	☐	☐	☐
Skout	☐	☐	☐	☐	☐	☐	☐	☐	☐
Snapchat	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tinder	☐	☐	☐	☐	☐	☐	☐	☐	☐
Tumblr	☐	☐	☐	☐	☐	☐	☐	☐	☐
Twitter	☐	☐	☐	☐	☐	☐	☐	☐	☐
Viber	☐	☐	☐	☐	☐	☐	☐	☐	☐
Vine	☐	☐	☐	☐	☐	☐	☐	☐	☐
Voxer	☐	☐	☐	☐	☐	☐	☐	☐	☐
WhatsApp	☐	☐	☐	☐	☐	☐	☐	☐	☐
	Several	A few	Once	A few	Once	A few	Once	A few	Never

	times a day	times a day	or twice a day	times a week	or twice a week	times a month	or twice a month	times a year	use
Whisper	☐	☐	☐	☐	☐	☐	☐	☐	☐
Yik Yak	☐	☐	☐	☐	☐	☐	☐	☐	☐
4chan	☐	☐	☐	☐	☐	☐	☐	☐	☐
9Gag	☐	☐	☐	☐	☐	☐	☐	☐	☐

4. Are there any other social media platforms you regularly use that were not listed above? Please write them in the text box below:

Appendix F: Reactive-Proactive Aggression Questionnaire

(RPQ; Raine et al., 2006)

Instructions. There are times when most of us feel angry, or have done things we should not have done. Rate each of the items below by putting a circle around 0 (never), 1 (sometimes), or 2 (often). Do not spend a lot of time thinking about the items—just give your first response. Make sure you answer all the items (see below).

Never	Sometimes	Often
0	1	2

How often have you...

1. Yelled at others when they have annoyed you
2. Had fights with others to show who was on top
3. Reacted angrily when provoked by others
4. Taken things from other students
5. Gotten angry when frustrated
6. Vandalized something for fun
7. Had temper tantrums
8. Damaged things because you felt mad
9. Had a gang fight to be cool
10. Hurt others to win a game
11. Become angry or mad when you don't get your way
12. Used physical force to get others to do what you want
13. Gotten angry or mad when you lost a game
14. Gotten angry when others threatened you
15. Used force to obtain money or things from others
16. Felt better after hitting or yelling at someone
17. Threatened and bullied someone
18. Made obscene phone calls for fun
19. Hit others to defend yourself
20. Gotten others to gang up on someone else
21. Carried a weapon to use in a fight
22. Gotten angry or mad or hit others when teased
23. Yelled at others so they would do things for you

Note: Permission to use this scale provided by authors in their 2006 article.

Appendix G: Cyberbullying Definitions and Behaviours Questionnaire

(CDBQ; Myburgh, 2017)

CDBQ – Victim

Over the past year, please indicate how often you have experienced the following behaviours online:[29]

0	1	2	3	4	5
Never	At least once a year	At least once every few months	At least once a month	At least once a week	At least once a day

1) Someone started an argument with me online because of something I posted.
2) Someone trolled me because of things I shared online.
3) Someone spread rumours about me online.
4) Someone created a social media account and pretended to be me.
5) Someone posted inappropriate pictures of me online without my permission.
6) Someone purposely unfriended/unfollowed me on social media because they were mad at me.
7) Someone threatened me online.
8) Someone hacked into one of my social media accounts and pretended to be me.
9) Someone verbally attacked me for something I posted online.
10) Someone gossiped about me to others online.
11) Someone hacked into one of my social media accounts and posted inappropriate things to other people.
12) Someone trolled my updates or pictures to friends.
13) Someone took a picture or video of me and posted it without my permission.
14) Someone has tried to turn my friends against me online.
15) Someone online threatened to harm me.
16) Someone picked a fight with me online.
17) Someone hacked into one of my social media accounts and posted things I wouldn't post.
18) Someone made hurtful comments to me about a status update or post I shared. or picture/video that I shared.
19) Someone made hurtful comments to me about a picture or video I shared online.
20) A former partner shared intimate pictures and/or videos of me online.
21) Someone has excluded me from online groups or messages because they don't like me.
22) Someone sent me nasty, mean, and/or insulting messages.
23) Someone sent me nasty, mean, and/or insulting pictures or videos.
24) Someone befriended me online in order to get private information from me.
25) A person randomly attacked me online for something I liked or shared.
26) Someone sent me unwanted sexually explicit messages.
27) Someone sent me unwanted sexually explicit pictures or videos.

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[29] Format for both victim and perpetrator versions adapted from Goldsmid & Howie (2014); content adapted from Calvete et al. (2010); Dredge et al. (2014); Holfeld & Leadbeater (2015); Leung & McBride-Chang (2013); Newey et al. (2011).

28) Someone tried to stir up trouble between me and another person online by sharing false information.
29) Someone kept hacking in to my social media accounts.
30) Someone has shared confidential information online that I trusted them with.
31) Someone has deliberately ignored my online messages to them.
32) Someone online threatened my life.
33) Someone continually spread the same rumour about me online.
34) Someone set up a social media account and pretended to be me.
35) Someone took personal information about me and shared it online without my permission.
36) Someone has deliberately not accepted my friend requests online.
37) Someone took a screenshot of a private picture or video I sent them that is meant to disappear (i.e., a Snapchat).

[*If participant endorsed any of the behaviours in this version of the CDBQ, they were asked to select one item they endorsed to answer the following series of questions*]:

Thinking of the **most recent** time you experienced the online behaviour you identified:

On which social media platform did this occur? (**Medium**)
Please specify: _____

How did you know the person who did this? (**Anonymity**)
☐ A friend of mine
☐ A person I know from school
☐ A person I know from my community
☐ A person I know online, but have not met in person
☐ I don't know who did it

Did the behaviour occur (check all that apply)… (**Level of publicity**)
☐ Privately (i.e., they sent you a private message)
☐ Semi-privately (i.e., they posted something on the wall of a closed group)
☐ Publicly (i.e., they shared it for everyone to see)

How much distress did this occurrence cause you? (**Outcome – wellbeing**)
1 = No distress ←→ 10 = Extreme distress

How much distress did the person who did this intend to cause you? (**Intent**)
1 = Did not intend distress ←→ 10 = Intended extreme distress

Was the act targeting any of the following? Check all that apply: (**Situational factors**)
☐ Your race/ethnicity
☐ Your sexual orientation (e.g., because you are gay, straight, lesbian, bisexual)
☐ Your gender (e.g., because you are transgender, female)
☐ Your physical appearance
☐ Your disability or exceptionality
☐ Your religious beliefs
☐ Your academic abilities

☐ Your social group or friends
☐ Other reason (please specify): _____

How popular are you as compared to the person who did this? (**Power differential**)
☐ More popular
☐ Equally popular
☐ Less popular
☐ Don't know

How physically strong are you as compared to the person who did this? (**Power diff.**)
☐ Stronger than
☐ Equally as strong
☐ Weaker than
☐ Don't know

How intelligent are you as compared to the person who did this? (**Power diff.**)
☐ More intelligent
☐ Equally intelligent
☐ Less intelligent
☐ Don't know

How technologically skilled (e.g., website building, coding, hacking) are you as compared to the person who did this? (**Power diff.**)
☐ More technologically skilled
☐ Equally technologically skilled
☐ Less technologically skilled
☐ Don't know

Do you feel that you did something to provoke or initiate this behaviour/response from the other person? (**Without provocation**)
☐ Yes (please explain): _____
☐ No
☐ I don't know

Would you classify this event as cyberbullying? (**Definitional understanding of event**)
☐ Yes (please explain): _____
☐ No (please explain): _____
☐ I don't know

CDBQ – Perpetrator

Over the past year, please indicate how often you have engaged in the following behaviours online:

0	1	2	3	4	5
Never	At least once a year	At least once every few months	At least once a month	At least once a week	At least once a day

1) I started an argument with someone online because of something they posted.
2) I trolled someone because of things they shared online.
3) I spread rumours about someone online.
4) I created a social media account and pretended to be someone else.
5) I posted inappropriate pictures of someone online without their permission.
6) I purposefully unfriended/unfollowed someone on social media because I was mad at them.
7) I threatened someone online.
8) I hacked into someone's social media accounts and pretended to be them.
9) I verbally attacked someone for something they posted online.
10) I gossiped about someone to others online.
11) I hacked into someone's social media accounts and posted inappropriate things to other people.
12) I trolled someone's updates or pictures to friends.
13) I took a picture or video of someone and posted it online without their permission.
14) I tried to turn someone's friends against them online.
15) I threatened harm to someone online.
16) I picked a fight with someone online.
17) I hacked into someone's social media accounts and posted things they wouldn't post.
18) I made hurtful comments to someone about a status update or post they shared.
19) I made hurtful comments to someone about a picture or video they shared.
20) I shared intimate pictures and/or videos of a former partner online.
21) I excluded someone from online groups or messages because I don't like them.
22) I sent someone nasty, mean, and/or insulting messages.
23) I sent someone nasty, mean, and/or insulting pictures or videos.
24) I befriended someone online in order to get private information from them.
25) I randomly attacked someone for something they liked or shared online.
26) I sent someone unwanted sexually explicit messages.
27) I sent someone unwanted sexually explicit pictures or videos.
28) I tried to stir up trouble between someone and another person online through sharing false information.
29) I kept hacking in to someone's social media accounts.
30) I shared confidential information online that someone trusted me with.
31) I deliberately ignored someone's online messages to me.
32) I threatened someone's life online.
33) I continually spread the same rumour about someone online.
34) I set up a social media account and pretended to be someone else.
35) I took personal information about someone and shared it online without their permission.
36) I deliberately did not accept someone's friend requests online in order to exclude them.

37) I took a screenshot of a private picture or video someone sent me that is meant to disappear (i.e., a Snapchat).

[*If participant endorsed any of the behaviours in this version of the CDBQ, they were asked to select one item they endorsed to answer the following series of questions*]:

Thinking of the **most recent** time you experienced the online behaviour you identified:

On which social media platform did this occur? (**Medium**)
Please specify: _____

How did you know the target? (**Anonymity**)
☐ A friend of mine
☐ A person I know from school
☐ A person I know from my community
☐ A person I know online, but have not met in person
☐ I don't know them

Did the behaviour occur (check all that apply)… (**Level of publicity**)
☐ Privately (i.e., you sent a private message to them)
☐ Semi-privately (i.e., you posted something on the wall of a closed group)
☐ Publicly (i.e., you shared it for everyone to see)

How much distress did this occurrence cause your target? (**Outcome – wellbeing**)
1 = No distress ←→ 10 = Extreme distress

How much distress did you intend to cause your target? (**Intent**)
1 = Did not intend distress ←→ 10 = Intended extreme distress

Was the act targeting any of the following? Check all that apply: (**Situational factors**)
☐ Their race/ethnicity
☐ Their sexual orientation (e.g., because they identify as gay, straight, lesbian, bisexual)
☐ Their gender (e.g., because they identify as transgender, female)
☐ Their physical appearance
☐ Their disability or exceptionality
☐ Their religious beliefs
☐ Their academic abilities
☐ Their social group or friends
☐ Other reason (please specify): _____

How popular are you as compared to the target? (**Power differential**)
☐ More popular
☐ Equally popular
☐ Less popular
☐ Don't know

How physically strong are you as compared to the target? (**Power diff.**)

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□ Stronger than
□ Equally as strong
□ Weaker than
□ Don't know

How intelligent are you as compared to the target? (**Power diff.**)
□ More intelligent
□ Equally intelligent
□ Less intelligent
□ Don't know

How technologically skilled (e.g., website building, coding, hacking) are you as compared to the target? (**Power diff.**)
□ More technologically skilled
□ Equally technologically skilled
□ Less technologically skilled
□ Don't know

Do you feel that the target did something to initiate this behaviour/response from you? (**Without provocation**)
□ Yes (please explain): _____
□ No
□ I don't know

Would you classify this event as cyberbullying? (**Definitional understanding of event**)
□ Yes (please explain): _____
□ No (please explain): _____
□ I don't know

CDBQ – Victim & Perpetrator Subscales[30]

- *Flaming (online fights or arguments)*: 3 items (1, 16, 25)
- *Harassment (insults or threats)*: 12 items (2, 7, 9, 12, 15, 18, 19, 22, 23, 26, 27, 32)
- *Denigration (spreading rumours)*: 4 items (3, 10, 28, 33)
- *Impersonation (pretending to be someone else)*: 6 items (4, 8, 11, 17, 29, 34)
- *Outing (revealing secrets)*: 6 items (5, 13, 20, 30, 35, 37)
- *Trickery (trying to get someone to reveal their secrets to you and then exposing them online)*: 1 item (24)
- *Exclusion (from online groups/activities)*: 5 items (6, 14, 21, 31, 36)

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[30] Based on Willard's (2007) classification system of cyberbullying behaviours.

Appendix H: Bullying Behaviours among Postsecondary Students

(BBPS; Myburgh, 2017)

BBPS – Victim

Have you experienced any of the following behaviours (but not online) over the past year?

0 Never	1 At least once a year	2 At least once every few months	3 At least once a month	4 At least once a week	5 At least once a day

1) Someone hit me because they were angry with me.
2) Someone threatened me (but not online).
3) Someone excluded me from social outings.
4) Someone spread rumours about me (but not online).
5) Someone pushed or shoved me out of anger.
6) Someone called me inappropriate names (but not online).
7) Someone tried to get my friends to turn against me (but not online).
8) Someone blackmailed me (but not online).

BBPS – Perpetrator

Have you engaged in any of the following behaviours (but not online) over the past year?

0 Never	1 At least once a year	2 At least once every few months	3 At least once a month	4 At least once a week	5 At least once a day

1) I hit someone because I was angry with them.
2) I threatened someone (but not online).
3) I excluded someone from social outings.
4) I spread rumours about someone (but not online).
5) I pushed or shoved someone out of anger.
6) I called someone inappropriate names (but not online).
7) I tried to get my friends to turn against someone (but not online).
8) I blackmailed someone (but not online).

BBPS – Victim & Perpetrator Subscales
Physical aggression: 2 items (1, 5)
Direct social aggression (nonverbal exclusion, relationship manipulation): 2 items (3, 8)
Indirect social aggression (spreading rumours, relationship manipulation): 2 items (4, 7)
Verbal aggression (threats and name-calling): 2 items (2, 6)

Appendix I: Internet Addiction Test

(IAT; Young, 1998)

		Rarely	Occasionally	Frequently	Often	Always	Does not apply
1	How often do you find that you stay on-line longer than you intended?	☐	☐	☐	☐	☐	☐
2	How often do you neglect household chores to spend more time on-line?	☐	☐	☐	☐	☐	☐
3	How often do you prefer the excitement of the Internet to intimacy with your partner?	☐	☐	☐	☐	☐	☐
4	How often do you form new relationships with fellow online users?	☐	☐	☐	☐	☐	☐
5	How often do others in your life complain to you about the amount of time you spend on-line?	☐	☐	☐	☐	☐	☐
6	How often do your grades or school work suffers because of the amount of time you spend on-line?	☐	☐	☐	☐	☐	☐
7	How often do you check your email before something else that you need to do?	☐	☐	☐	☐	☐	☐
8	How often does your job performance or productivity suffer because of the Internet?	☐	☐	☐	☐	☐	☐
9	How often do you become defensive or secretive when anyone asks you what you do on-line?	☐	☐	☐	☐	☐	☐
10	How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?	☐	☐	☐	☐	☐	☐
11	How often do you find yourself anticipating when you will go online again?	☐	☐	☐	☐	☐	☐
12	How often do you fear that life without the Internet would be boring, empty, and joyless?	☐	☐	☐	☐	☐	☐
13	How often do you snap, yell, or act annoyed if someone bothers you while you are on-line?	☐	☐	☐	☐	☐	☐
14	How often do you lose sleep due to late-night log-ins?	☐	☐	☐	☐	☐	☐
15	How often do you feel preoccupied with the Internet when offline, or fantasize about being online?	☐	☐	☐	☐	☐	☐
16	How often do you find yourself saying "just a few more minutes" when online?	☐	☐	☐	☐	☐	☐
17	How often do you try to cut down the amount of time you spend online and fail?	☐	☐	☐	☐	☐	☐
18	How often do you try to hide how long you've been online?	☐	☐	☐	☐	☐	☐
19	How often do you choose to spend more time online over going out with others?	☐	☐	☐	☐	☐	☐
20	How often do you feel depressed, moody or nervous when you are offline, which goes away once you are back online?	☐	☐	☐	☐	☐	☐

Note: Scale made available by author on website (http://netaddiction.com/Internet-addiction-test/)

Appendix J: Satisfaction with Life Scale

(SWLS; Diener et al., 1985)

Below are five statements that you may agree or disagree with. Using the scale below, indicate your agreement with each item. Please be open and honest in your responding.

1	2	3	4	5	6	7
Strongly agree	Agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Disagree	Strongly disagree

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Note: Permission to use scale provided by first author on his website
(https://internal.psychology.illinois.edu/~ediener/SWLS.html)