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Cyberbullying and Internalizing Difficulties among Indigenous Adolescents in Canada: Beyond the Effect of Traditional Bullying

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Abstract Most research on bullying and cyberbullying has focused on dominant populations. In particular, inquiries into Indigenous adolescents' involvement in bullying and cyberbullying are scarce. The present study examines the relationship between bullying and cyberbullying involvement and self-reported depression, anxiety, and stress among a sample of 170 Indigenous adolescents (54% female; M age = 15.2 years). Controlling for age and gender, the results of a series of hierarchical multiple regression models indicate that cyberbullying victimization uniquely contributes to self-reported anxiety and stress among Indigenous adolescents, beyond the contribution of traditional bullying victimization. The implications of these findings are discussed.

Keywords Cyberbullying · Internalizing difficulties · Indigenous · Canada

Over time, fueled in part by high-profile tragedies, public awareness and concern about bullying and cyberbullying has grown. Paralleling this concern, a number of empirical studies have sought to identify the impact of bullying and cyberbullying on adolescents' well-being. Summarizing the results of several studies, Rigby (2003) and Gini and Pozzoli (2009) conclude that adolescents who are the target of physical, verbal, and social bullying (i.e., 'traditional' bullying) are more likely to experience internalizing problems, including depression, anxiety, poor social adjustment, and low self-esteem.

A meta-analysis of the scholarship on cyberbullying yielded similar conclusions (Kowalski et al. 2014). Indeed, researchers have observed that adolescents who are the target of cyberbullying are more likely to experience depression (Bonanno and Hymel 2013; Didden et al. 2009), social anxiety (Juvoven and Gross 2008), and low self-esteem (Patchin and Hinduja 2010) than their peers who are not involved in cyberbullying. Adolescents who have experienced cyberbullying are also significantly more likely to have contemplated suicide (Hinduja and Patchin 2010). Some scholars have gone so far as to suggest that adolescents who are the target of cyberbullying may experience poorer outcomes, especially in relation to internalizing difficulties, than youth who are bullied via other means (Cole et al. 2016; Waasdorp and Bradshaw 2014). Fewer studies have examined the emotional well-being of adolescents who engage in cyberbullying behaviors; of those that have explored this relationship, cyberbullies have been shown to report more externalizing (Hinduja and Patchin 2007) and internalizing problems (Bonanno and Hymel 2013; Patchin and Hinduja 2010) than other youth.

A complicating factor when studying cyberbullying is the lack of a widely agreed upon definition of the phenomenon (see Kowalski et al. 2014; National Academies of Sciences, Engineering, and Medicine 2016; Tokunaga 2010 for reviews). Olweus' (1993) widely adopted definition of traditional forms of bullying suggests that bullying consists of a *more powerful* individual or group *intentionally* and *repeatedly* harming another individual or group. Comparable definitions are often applied to cyberbullying—with obligatory and important references to electronic communications (Tokunaga 2010). Indeed, in part, the electronic nature of cyberbullying may contribute to the poor outcomes experienced by those involved (Bauman 2013; Kowalski et al.

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2014). Yet, defining and measuring cyberbullying is complicated by the pervasiveness of technology (Mishna et al. 2009) and "by the fact that cyberbullying can take so many different forms and occur through so many different venues" (Kowalski et al. 2014, p. 1074). Nevertheless, the National Academies (2016) recommends that "cyberbullying should be considered within the context of bullying rather than as a separate entity" (p. 60). In the present study, we consider cyberbullying to include being threatened, embarrassed, singled out, gossiped about, or made to look bad through the internet, cell phone text messages, or pictures.

Although cyberbullying has been a burgeoning topic of study for the past decade, to date most research has drawn upon samples of adolescents from dominant—largely white and middle class—populations. Espinoza (2015) advocates moving beyond a reliance on samples comprised of dominant youth to "obtain more meaningful information about the impact of cybervictimization" (p. 47). Some have heeded this advice, yet research on Indigenous[1] adolescents' involvement in bullying, and especially cyberbullying, remains scarce (Coffin et al. 2010; Lemstra et al. 2011). Nevertheless, the small number of studies that have included Indigenous participants has found that Indigenous adolescents experience frequent bullying (Carlyle and Steinman 2007; Lemstra et al. 2011).

The lack of studies examining Indigenous adolescents' experiences with bullying and cyberbullying is particularly troubling given the plethora of evidence that colonization and forced assimilation policies have contributed to comparatively poorer mental health among Indigenous peoples (Kirmayer et al. 2003). The demonstrated harmful effects of bullying and cyberbullying on adolescents' emotional well-being, coupled with the deleterious impact of Canada's colonial past, may further disadvantage Indigenous youth. What is more, given the lack of evidence as it relates to Indigenous adolescents, bullying prevention and health promotion programs are usually developed on evidence derived from samples of youth comprising dominant cultures. This is of concern because there is also considerable evidence demonstrating that culturally-relevant programming is essential to meeting the needs of Indigenous adolescents (Hawkins et al. 2004; Kenyon and Hanson 2012; Kirmayer et al. 2003; Moran and Reaman 2002; Penn et al. 2008).

To address this considerable gap in the literature, the present study explores the relationship between bullying and cyberbullying victimization and perpetration and internalizing problems (depression, anxiety, and stress) among a sample of Indigenous adolescents in Canada. Specifically, we address two research questions: (1) Does cyberbullying *victimization*

uniquely contribute to internalizing problems among Indigenous Canadian adolescents beyond the effects of traditional bullying *victimization*? and (2) Does cyberbullying *perpetration* uniquely contribute to internalizing problems among Indigenous Canadian adolescents beyond the effects of traditional bullying *perpetration*? In studying these questions, we aim to contribute to the growing literature on cyberbullying among marginalized youth by adding perspective on the experiences of Indigenous adolescents.

Bullying and Cyberbullying among Indigenous Adolescents

Several studies have shown bullying to be pervasive among Canadian adolescents (Craig et al. 2015; MacCormack 2014; Vaillancourt et al. 2010). Yet, little research has examined the bullying experiences of Indigenous adolescents in Canada. Of the handful of studies that have been conducted, findings suggest that rates of bullying among Indigenous adolescents may be higher than among non-Indigenous youth (Do 2012; Lemstra et al. 2011; for an exception, see Brownlee et al. 2014). Frequent bullying among Indigenous adolescents has also been found among samples of American youth (Campbell and Smalling 2013; Carlyle and Steinman 2007). Oftentimes, Indigenous adolescents are bullied specifically because of their heritage (Melander et al. 2013). Known as 'ethnic bullying,' and also affecting youth from other minority cultures, a large proportion of Indigenous adolescents' report experiencing bullying that targets their ethnicity and cultural heritage (Hare and Pidgeon 2011; Schumann et al. 2013; Whitbeck et al. 2001).

Generally, fewer adolescents experience cyberbullying than traditional bullying (Cappadocia et al. 2013; Craig et al. 2015; Modecki et al. 2014). However, cyberbullying among Indigenous adolescents has rarely been investigated. Simple prevalence rates are the most commonly reported data, and these suggest comparable patterns to Indigenous adolescents' involvement in traditional bullying. For example, Lemstra et al. (2011) found that 30% of on-reserve First Nations adolescents in the fifth through eighth grades reported being electronically bullied. Paralleling the findings of studies investigating youth from dominant cultures, Brownlee et al. (2014) found that cyberbullying was less common than traditional bullying among Indigenous adolescents.

The harmful effect of bullying and cyberbullying on adolescents' physical and emotional health has been well-documented (e.g., Gini and Pozzoli 2009; Kowalski et al. 2014). Yet, research studying the health outcomes of bullying among Indigenous adolescents is also limited. Of the small number of studies available, it seems that outcomes for Indigenous adolescents may mirror those of youth in dominant populations. For example, Lemstra et al. (2011) found that Native American youth who experienced peer victimization were two times more

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[1] We use the term "Indigenous" to emphasize the shared histories and experiences—yet distinctiveness—of first peoples across Canada. When we cite research from others who have focused on a more specific group (e.g., First Nations, Native American), then we make that distinction.

likely to experience depression than youth who did not experience bullying. Victimization related to ethnic discrimination has also been shown to increase adolescents' experiences of internalizing problems, such as depression, anxiety, and somatic complaints, and externalizing problems, such as aggression, delinquency, and substance abuse (Whitbeck et al. 2001). While the link between bullying and poor well-being is, in itself, cause for concern, negative outcomes may be compounded for Indigenous adolescents. That is, bullying and cyberbullying occur against a backdrop of general increased adversity. For example, relative to others, Indigenous peoples in Canada experience pervasive health inequalities that result in increased physical and mental health concerns, including substance abuse, psychological distress, psychiatric illness, and suicide (Gracey and King 2009; Health Canada 2014; Kisely et al. 2016).

Method

Data

Data for the present study were collected between September 2014 and March 2015, and come from a larger evaluation of the effectiveness of a universal school-based substance use and violence prevention program. All youth who participated in this 14-session program were also invited to complete pre- and post-intervention surveys.[2] Written consent was provided by the parent/guardian of all participants, and adolescents provided their assent to participate.[3] Participants were diverse, and come from three Canadian provinces and one territory. Survey questions asked all participants to self-report their ethnicity, with 172 self-identifying as Indigenous (status or non-status First Nations, Inuit, or Métis).

Surveys were administrated in paper-and-pencil format prior to the first lesson of the program being evaluated (i.e., at pre-test). Surveys were developed by the authors and comprised largely of published and validated measures. The present study draws upon responses to questions pertaining to adolescents' experiences with bullying and cyberbullying in the past month (as the target and perpetrator); past week experiences consistent with depression, anxiety, and stress; and their demographic characteristics. The research design was approved by a university institutional review board and by the research committees of participating school boards. Surveys took approximately 60 min to complete.

Some missing data, ranging from 8.1% to 9.9% of the sample, were observed on the dependent variables. To address missing data and improve statistical power, missing data were

imputed in *Stata 14* (StataCorp 2015) using a multivariate normal distribution (MVN) approach, which relies upon Markov Chain Monte Carlo (MCMC) simulations. Following Graham et al.'s (2007) guidelines, 20 datasets were imputed and regression analyses were conducted on pooled estimates. Pooled scores on factor variables were rounded to the nearest integer. This approach has been shown to produce reliable estimates when the sample size is large and the fraction of missing data is small (Demirtas et al. 2008; Lee and Carlin 2010).

Measures

The present study assesses the impact of traditional bullying and cyberbullying on three dependent variables: depression, anxiety, and stress. Dependent variables come from the respective sub-scales of the 21-item short version of the Depression Anxiety Stress Scales (DASS-21; Lovibond and Lovibond 1995). Participants were asked how often each of several statements applied to them over the past week, and responded on a four-point scale ranging from "never" to "more than two times." The DASS is a widely-used, reliable, and valid self-report measure that distinguishes well between depression, anxiety, and stress among adults in both clinical and community samples (Antony et al. 1998). More recently, its factor structure has been confirmed in young adolescent samples (Szabo 2010).

The DASS-21 identifies low positive affect, apathy, hopelessness, and self-deprecation as the core symptoms of depression (sample items include "I couldn't seem to experience any positive feelings at all" and "I found it difficult to work up the initiative to do things"), and physiological arousal and excessive worrying as the core symptoms of anxiety (sample items include "I was aware of dryness in my mouth" and "I was worried about situations in which I might panic and make a fool of myself"). The inclusion of the stress scale is unique to the DASS (Szabo 2010). The core symptoms of stress include difficulty relaxing, irritability, tension, and agitation (sample items include "I found it difficult to relax" and "I was intolerant of anything that kept me from getting on with what I was doing"). All scales demonstrated good internal reliability for our analytic sample, with Cronbach's alpha's all above .8 (α(depression) = .908, α(anxiety) = .830, α(stress) = .857).

Adolescents' past-month experiences with traditional bullying and cyberbullying were assessed using items from the seventh to twelfth grade version of PREVNet's[4] Bullying Evaluation and Solutions Tool (BEST). Two separate scales measuring adolescents' victimization and perpetration experiences contain four items assessing involvement in different types of bullying on a four-point scale ranging from "never"

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[2] Participants for the present study were selected from the pre-intervention surveys to ensure that program effects do not influence their perceptions of traditional bullying, cyberbullying, or emotional well-being.
[3] Those participants who were of the age of majority provided written consent, in lieu of parental consent and assent.

[4] PREVNet (the Promoting Relationships and Eliminating Violence Network) is a large collaboration among researchers, educators, and professionals working to prevent bullying. For a more detailed overview, see http://www.prevnet.ca/about

to "at least once a week": physical, verbal, social, and electronic. Each item includes examples of behaviors that may constitute that type of bullying. Sample items include "Have you been bullied by another student physically? Physical bullying includes being hit, pushed, shoved, slapped, kicked, spit at, or beaten up" and "Have you bullied other students electronically? Electronic bullying includes being threatened, embarrassed, singled out, gossiped about, or made to look bad through the Internet or phone text messages."

An important characteristic distinguishing bullying from other types of peer victimization is that bullying is repeated in nature (Olweus 1993). Thus, participants who reported having never been bullied or having been bullied only once were recoded as having not been involved in bullying; likewise, participants who indicated that they had been bullied two or more times in the past month were recoded as having been involved in bullying (see also Kowalski et al. 2014). This resulted in four binary variables measuring types of victimization and four binary variables measuring types of perpetration. A preliminary review of sample statistics indicated low frequencies for the individual types of traditional bullying; thus, to improve the robustness of our analyses we grouped the three items measuring 'traditional' bullying—physical, verbal, and social—into a single variable such that participants who reported being bullied in at least one of these ways were considered to have been a victim of traditional bullying, and participants who reported bullying others in at least one of these ways were considered to have been a perpetrator of traditional bullying.

Control variables included age (in years) and gender.[5] Gender was originally measured as male, female, or other; however, only two participants identified as "other" and were thus excluded from analyses. Thus, our analytic sample included 170 Indigenous adolescents.

Analytic Strategy

Data analysis began by first examining descriptive statistics for the study sample (see Table 1). Our sample was comprised of an approximately equal proportion of males and females (54.1% female), and the average age of participants was 15.2 years ($SD = 2.0$). More than one-third (35.1%) of Indigenous adolescents reported experiencing traditional bullying in the past month, and about 1-in-6 (17.3%) reported experiencing cyberbullying. These results are in keeping with other studies that have found that cyberbullying is less prevalent than traditional forms of bullying (e.g., Modecki et al. 2014; Wang et al. 2009). Nearly one-fifth of participants also

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[5] Preliminary analyses included a measure of socio-economic status (SES) as a third control variable; however, the 4-item measure used demonstrated poor internal reliability for the present sample ($\alpha = .363$) and was thus excluded from further analyses. Nevertheless, the results were consistent with and without the SES measure.

Table 1 Descriptive statistics

	Mean or Percent	SD [Range]
Dependent variables		
Depression	7.4	6.5 [0–21]
Anxiety	5.9	5.3 [0–21]
Stress	7.0	5.5 [0–21]
Independent variables		
Traditional bullying victim	35.1	
Cyberbullying victim	17.3	
Traditional bullying perpetrator	19.4	
Cyberbullying perpetrator	19.9	
Control variables		
Female	54.1	
Age	15.2	2.0 [11–22]

acknowledged bullying others via traditional and electronic means (19.4% and 19.9%, respectively).

All assumptions of linear regression were met, with the exception of the normality assumption for our dependent variables, which were all positively skewed. To correct for skewness, the natural logs of scores on the depression, anxiety, and stress scales were entered into regression analyses. To isolate the influence of cyberbullying on internalizing problems among Indigenous adolescents we estimated a series of hierarchical linear regression models. Separate models were estimated for victims and perpetrators of bullying and for each dependent variable. For all models, Step 1 measures the contribution of gender and age to internalizing problems. In Step 2, traditional bullying victimization or perpetration was added, and the difference in R^2 is reported (ΔR^2), which indicates the unique contribution of traditional bullying to the explained variance in internalizing problems beyond the effect of the control variables. In Step 3, cyberbullying victimization or perpetration was added. Like in Step 2, ΔR^2 indicates the unique contribution of cyberbullying to the explained variance in internalizing problems, beyond the effect of gender, age, and traditional bullying.

Results

Cyberbullying Victimization and Internalizing Problems

The results of hierarchical regression analyses describing the association between traditional bullying victimization, cyberbullying victimization, and internalizing problems are shown in Table 2. Step 1 indicates that females are significantly more likely than males to experience depression, anxiety, and stress. Likewise, as shown in Step 2, victims of traditional bullying are significantly more likely to report feeling depressed, anxious or stressed. Moreover, traditional bullying

Table 2 Hierarchical regression modelling the unique contribution of cyberbullying victimization to internalizing problems

Variable	Depression				Anxiety				Stress			
	b	SE	F^a	R^2 (ΔR^2)	b	SE	F^b	R^2 (ΔR^2)	b	SE	F^c	R^2 (ΔR^2)
Step 1			6.76**	.083 (.083)			6.73**	.083 (.083)			6.88**	.081 (.081)
Female	.597***	.160			.504***	.141			.493***	.134		
Age	.007	.042			.029	.036			−.014	.034		
Constant	1.255	.653			.894	.554			1.745**	.529		
Step 2			10.72***	.175 (.092)			13.39***	.215 (.132)			11.70***	.187 (.106)
Female	.508**	.154			.411**	.133			.413**	.128		
Age	.021	.041			.044	.034			−.001	.033		
TB victim	.672***	.159			.693***	.139			.603***	.136		
Constant	.845	.633			.472	.523			1.378	.509		
Step 3			8.03***	.177 (.002)			11.70***	.242 (.027)			11.12***	.226 (.039)
Female	.494**	.157			.353*	.134			.344**	.129		
Age	.020	.041			.039	.033			−.006	.032		
TB victim	.629**	.184			.518**	.154			.396**	.150		
Cyberbullying victim	.113	.242			.459*	.199			.540**	.195		
Constant	.865	.637			.552	.516			1.472**	.500		

TB traditional bullying

[a] $df_{(Step\ 1)} = 2, 157.7$; $df_{(Step\ 2)} = 3, 160.2$; $df_{(Step\ 3)} = 4, 159.9$

[b] $df_{(Step\ 1)} = 2, 156.4$; $df_{(Step\ 2)} = 3, 156.8$; $df_{(Step\ 3)} = 4, 158.1$

[c] $df_{(Step\ 1)} = 2, 162.2$; $df_{(Step\ 2)} = 3, 160.6$; $df_{(Step\ 3)} = 4, 160.5$

* $p < .05$; ** $p < .01$; *** $p < .001$

victimization uniquely accounts for between 9% and 13% of the explained variance in the dependent variables.

The contribution of cyberbullying victimization to internalizing problems is measured in Step 3. Beginning with depression, the results indicate that females ($p = .002$) and victims of traditional bullying ($p = .001$) remain more likely to experience depression; however, victims of cyberbullying are not more likely to feel depressed than non-victims ($p = .640$) and cyberbullying victimization does not contribute uniquely to one's likelihood of experiencing depression ($R^2 = .177$, $\Delta R^2 = .002$, $F(4, 159.9) = 8.03$, $p < .001$). Like depression, females ($p = .009$) and adolescents who are targets of traditional bullying ($p = .001$) are more likely to experience anxiety. Adolescents who experience cyberbullying are also significantly more likely to report higher anxiety scores than youth who have not been cyberbullied ($p = .023$); cyberbullying victimization accounts for an additional 2.7% of the explained variance in anxiety scores, beyond the contribution of demographic characteristics and traditional bullying victimization ($R^2 = .242$, $F(4, 158.1) = 11.70$, $p < .001$). The results of hierarchical regression analyses modeling the contribution of demographic characteristics and bullying to self-reported stress are shown in the third panel of Table 2. Mirroring the results presented above, when cyberbullying victimization was added to regression models in Step 3, females ($p = .008$), victims of traditional forms of bullying ($p = .009$), and victims of cyberbullying ($p = .006$) report higher stress scores. Moreover, cyberbullying uniquely contributes 4% of the explained variance in stress scores ($R^2 = .226$, $F(4, 160.5) = 11.12$, $p < .001$).

Cyberbullying Perpetration and Internalizing Problems

The results of hierarchical regression analyses modeling the relationship between demographic characteristics, traditional bullying perpetration, and cyberbullying perpetration are presented in Table 3. Since demographic characteristics are entered at baseline prior to entering bullying variables in Steps 2 and 3, the results of Step 1 in each of the three perpetration models is the same as those described in Step 1 of the models discussed above in relation to victimization (see Table 2). Similarly, Step 2 of each model indicates that traditional bullies report significantly higher depression, anxiety, and stress scores, with traditional bullying perpetration accounting for about 3% to 7% of the explained variance in internalizing problems.

The inclusion of cyberbullying perpetration in Step 3 of the model contributes minimally to the explained variance in depression scores ($R^2 = .128$, $\Delta R^2 = .015$, $F(4, 159.5) = 5.45$, $p < .001$). Indeed, cyberbullying perpetration is not significantly associated with depression scores ($p = .105$), and the inclusion of cyberbullying perpetration suppresses the association between traditional bullying perpetration and depression ($p = .148$). As shown in Step 3, only gender remains significant, with females more likely to report higher depression scores ($p = .001$). Cyberbullying also accounts for little unique explained variance in anxiety scores ($R^2 = .144$, $\Delta R^2 = .016$, $F(4, 159.0) = 6.19$, $p < .001$). Again, cyberbullying perpetration was observed to be not significantly associated with anxiety scores ($p = .091$), and its inclusion suppresses the relationship between traditional bullying perpetration and anxiety scores ($p = .057$). Still, the association between gender and

Table 3 Hierarchical regression modelling the unique contribution of cyberbullying perpetration to internalizing problems

Variable	Depression				Anxiety				Stress			
	b	SE	F^a	R^2 (ΔR^2)	b	SE	F^b	R^2 (ΔR^2)	b	SE	F^c	R^2 (ΔR^2)
Step 1			6.76**	.083 (.083)			6.73**	.083 (.083)			6.88**	.081 (.081)
Female	.597***	.160			.504***	.141			.493***	.134		
Age	.007	.042			.029	.036			−.014	.034		
Constant	1.255	.653			.894	.554			1.745**	.529		
Step 2			6.31***	.113 (.030)			7.17***	.128 (.045)			8.93***	.149 (.068)
Female	.584***	.158			.488**	.138			.475***	.130		
Age	.013	.042			.035	.035			−.006	.033		
TB perpetrator	.448*	.199			.472**	.172			.566**	.164		
Constant	1.080	.647			.709	.543			1.524**	.513		
Step 3			5.45***	.128 (.015)			6.19***	.144 (.016)			7.42***	.167 (.018)
Female	.554**	.158			.463**	.138			.448**	.130		
Age	.008	.042			.031	.035			−.011	.033		
TB perpetrator	.314	.216			.354	.184			.444*	.172		
Cyberbullying perpetrator	.542	.332			.477	.280			.494	.284		
Constant	1.156	.645			.775	.541			1.594**	.512		

TB traditional bullying

[a] $df_{(Step\ 1)} = 2, 157.7$; $df_{(Step\ 2)} = 3, 159.2$; $df_{(Step\ 3)} = 4, 159.5$

[b] $df_{(Step\ 1)} = 2, 156.4$; $df_{(Step\ 2)} = 3, 157.8$; $df_{(Step\ 3)} = 4, 159.0$

[c] $df_{(Step\ 1)} = 2, 162.2$; $df_{(Step\ 2)} = 3, 161.1$; $df_{(Step\ 3)} = 4, 158.9$

* $p < .05$; ** $p < .01$; *** $p < .001$

internalizing problems remains robust as females are more likely than males to report experiencing anxiety ($p = .001$). Lastly, when considering self-reported stress, it is again observed that females ($p = .001$) and those who bully other via traditional methods ($p = .011$) report higher stress scores. Perpetrators of cyberbullying are no more likely to report higher stress than others ($p = .084$), and the inclusion of cyberbullying perpetration contributes less than 2% to the explained variance in adolescents' stress scores ($R^2 = .167$, $\Delta R^2 = .018$, $F(4, 158.9) = 7.42$, $p < .001$).

Discussion

Cyberbullying has been a topic of public concern and empirical inquiry for more than a decade, yet most research draws upon samples of adolescents from dominant cultures. Bullying and cyberbullying among Indigenous adolescents—one of society's most marginalized groups—is particularly understudied. What the small literature does suggest, though, is that bullying and cyberbullying are prevalent among Indigenous youth (Brownlee et al. 2014; Carlyle and Steinman 2007; Do 2012; Eisenberg et al. 2003; Lemstra et al. 2011). Often, bullying behaviors are ethnically motivated, and research shows that many Indigenous adolescents are targeted because of their heritage (Hare and Pidgeon 2011; Schumann et al. 2013; Whitbeck et al. 2001).

While it is clear that cyberbullying involvement correlates with negative affect, including internalizing problems like depression, anxiety, and stress (Bonanno and Hymel 2013; Juvoven and Gross 2008; Kowalski et al. 2014; Waasdorp and Bradshaw 2014), the extent to which such outcomes persist across cultures is not clear. Moreover, some scholars have suggested that the electronic nature of cyberbullying may contribute to especially poor outcomes (Bauman 2013; Kowalski et al. 2014); however, only a small number of studies have tested the unique contribution of cyberbullying to mental health outcomes beyond the effect of traditional bullying (e.g., Bonanno and Hymel 2013; Cole et al. 2016), and few have done so while focusing on marginalized youth (e.g., Espinoza 2015).

To address this deficit in the literature, the present study sought to examine the relationship between involvement in bullying and cyberbullying and internalizing problems among Indigenous adolescents. Specifically, we aimed to identify the unique contribution of cyberbullying victimization and perpetration to adolescents' self-reported depression, anxiety, and stress scores beyond the effects of demographic characteristics and traditional bullying victimization and perpetration. The results indicate that cyberbullying perpetration contributes minimally to adolescents' experiences of depression, anxiety, and stress. Previous research on outcomes of cyberbullying perpetration is limited and has produced mixed results. Our findings are consistent with Fletcher et al. (2014) who found that cyberbullying perpetration was not associated with worsening mental health among a sample of English 12- and 13-year-olds, but contrary to those reported by Campbell et al. (2013) who reported higher rates of depression, anxiety, and stress (measured using the DASS-21, albeit with a much larger sample than the present study) among cyberbullies compared to adolescents not involved in bullying. Others have suggested

that cyberbullies may report more externalizing than internalizing problems (Hinduja and Patchin 2007). Moreover, colonization and forced assimilation policies have contributed to comparatively poorer mental health among Canada's Indigenous peoples (Kirmayer et al. 2003), and it is possible that cyberbullying others does not uniquely contribute to internalizing problems among Indigenous adolescents given the magnitude of intergenerational traumas.

On the other hand, we find that cyberbullying victimization uniquely contributes to Indigenous adolescents' experiences of anxiety and stress, but not depression. In fact, cyberbullying victimization accounts for about 3% of the explained variance in anxiety and 4% of the explained variance in stress, beyond the contributions of demographic characteristics and traditional bullying victimization. This is a larger contribution than observed in other studies of internalizing problems with participants from dominant cultures. For example, Bonanno and Hymel (2013) found that cyber victimization contributes an additional 1% to the explained variance in depressive symptomatology above the influence of demographic characteristics and traditional victimization. Future research should endeavor to contextualize these findings by accounting for the influence of colonization and intergenerational trauma. Our results add to the small number of studies that have identified negative health outcomes associated with cyberbullying victimization among Indigenous adolescents, and support others (Bauman 2013; Kowalski et al. 2014) who have suggested that cyberbullying may be additively harmful for youth.

The findings suggest that cyberbullying among Indigenous youth may have similar patterns related to wellbeing as for non-Indigenous youth. That is, cyberbullying is associated with maladjustment, even if the extent to which the impact over and above traditional bullying was inconsistent. Nonetheless, the consistently high rates of bullying and cyberbullying for Indigenous youth underscores the importance of further research. In light of higher rates of numerous health inequities, further research should consider the extent to which these adversities moderate the impact of both traditional and cyberbullying. Another important research direction would be to more deeply investigate the *nature* of cyberbullying among Indigenous youth to understand the extent to which bullying is ethnically motivated. This seems especially important in light of the observed high rates of ethnic bullying experienced by Indigenous adolescents (Schumann et al. 2013). Given this, and as the picture of cyberbullying among Indigenous adolescents becomes clearer, there is a need to begin to develop and test culturally-informed prevention and intervention initiatives, as the inclusion of culture has been a central feature of other successful initiatives for this population (i.e., Donovan et al. 2015; Goodkind et al. 2012; LaFromboise and Lewis 2008; Le and Gobert 2015).

Notwithstanding the aforementioned results and implications, three limitations should be considered. First, the analytic sample drawn for this study comes from a larger diverse sample of youth who participated in the evaluation of a school-based violence prevention program. Thus, Indigenous youth were not randomly sampled and the results should not be considered generalizable to Indigenous youth in Canada or elsewhere. However, we note that our sample is large when considering the population of interest and includes participants from several regions of Canada. Second, we do not control for all possible variables that may influence internalizing problems among Indigenous youth. Specifically, we did not inquire about their on- or off-reserve living conditions, the mental and emotional well-being of their family members, or the influence of colonialism. As a result, we did not directly compare the experiences on Indigenous and non-Indigenous adolescents in an effort to avoid attributing behavior patterns to ethnicity when they may be better explained by structural influences like colonialism, poverty, and intergenerational trauma (Adelson 2005; Weaver 2009). Further, we did not control for adolescents' access to or use of social media; however, the digital divide in Canada disproportionately affects Indigenous Canadians (McMahon et al. 2011) and technology use may moderate the relationship between cyberbullying and health outcomes (e.g., Chen et al. 2016). Nevertheless, our analyses do permit an examination of the independent contributions of traditional and cyberbullying victimization and perpetration on self-reported depression, stress, and anxiety. Third, as a cross-sectional study we cannot conclude with certainty the causal direction of the relationship. Longitudinal studies, though, have demonstrated temporal ordering between bullying and cyberbullying and internalizing problems (Arseneault et al. 2008; Gamez-Guadix et al. 2013), allowing us confidence in the predicted direction of relationships.

Conclusion

Despite evidence suggesting high rates of bullying and cyberbullying involving Indigenous youth (Brownlee et al. 2014; Carlyle and Steinman 2007; Do 2012; Eisenberg et al. 2003; Lemstra et al. 2011), few studies have examined Indigenous adolescents' experiences with bullying and, especially, cyberbullying. Our results show that bullying and cyberbullying victimization and perpetration are prevalent among Indigenous adolescents, and that cyberbullying victimization uniquely contributes to internalizing problems among Indigenous youth, above and beyond the contributions of age and gender and involvement in traditional bullying. For those working with youth, our findings reaffirm the importance of allocating resources to supporting the emotional well-being of Indigenous adolescents. At least with respect to internalizing problems, it would seem as though adolescents who are cyberbullied experience more negative outcomes than those who are cyberbullies. Further, since peer victimization prevention and health promotion programs are often developed based

on samples of youth from dominant cultures, the results of this study contribute to the evidence about the impact of bullying and cyberbullying on Indigenous adolescents. As this evidence base continues to grow, culturally relevant programs that are grounded in empirical data about Indigenous youth should be encouraged.

Although the focus of this study was Indigenous adolescents in Canada, there are many similarities across colonized Indigenous peoples in Canada, the United States, New Zealand, and Australia. Thus, these findings may be applicable to a large group of Indigenous youths and may be informative for those working with Indigenous youth in those contexts. In particular, the results of this study suggest a need to further investigate cyberbullying experiences among Indigenous youth, as well as consider ways to best prevent and respond to cyberbullying in culturally appropriate ways.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

References

Adelson, N. (2005). The embodiment of inequity: Health disparities in aboriginal Canada. *Canadian Journal of Public Health, 96*(S2), S45–S61.

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the depression Anxiety stress scales in clinical groups and a community sample. *Psychological Assessment, 10*(2), 176–181.

Arseneault, L., Milne, B. J., Taylor, A., Adams, F., Delgado, K., Caspi, A., & Moffitt, T. E. (2008). Being bullied as an environmentally mediated contributing factor to children's internalizing problems. *Archives of Pediatric and Adolescent Medicine, 162*(2), 145–150.

Bauman, S. (2013). Cyberbullying: What does research tell us? *Theory Into Practice, 52*(4), 249–256.

Bonanno, R. A., & Hymel, S. (2013). Cyber bullying and internalizing difficulties: Above and beyond the impact of traditional forms of bullying. *Journal of Youth and Adolescence, 42*(5), 685–697.

Brownlee, K., Martin, J., Rawana, E., Harper, J., Mercier, M., Neckoway, R., & Friesen, A. (2014). Bullying behavior and victimization among aboriginal students within northwestern Ontario. *First Peoples Child & Family Review, 9*(1), 38–52.

Campbell, E. M., & Smalling, S. E. (2013). American Indians and bullying in schools. *Journal of Indigenous Social Development, 2*(1), 1–15.

Campbell, M. A., Slee, P. T., Spears, B., Buter, D., & Kift, S. (2013). Do cyberbullies suffer too? Cyberbullies' perceptions of the harm they cause to others and to their own mental health. *School Psychology International, 34*(6), 613–629.

Cappadocia, M. C., Craig, W. M., & Pepler, D. (2013). Cyberbullying prevalence, stability, and risk factors during adolescence. *Canadian Journal of School Psychology, 28*(2), 171–192.

Carlyle, K. E., & Steinman, K. J. (2007). Demographic differences in the prevalence, co-occurrence, and correlates of adolescent bullying at school. *Journal of School Health, 77*(9), 623–629.

Chen, L., Ho, S. S., & Lwin, M. O. (2016). A meta-analysis of factors predicting cyberbullying perpetration and victimization: From the social cognitive and media effects approach. *New Media & Society.* Published online ahead of print.

Coffin, J., Larson, A., & Cross, D. (2010). Bullying in an aboriginal context. *The Australian Journal of Indigenous Education, 39*(1), 77–87.

Cole, D. A., Zelkowitz, R. L., Nick, E., Martin, N. C., Roeder, K. M., Sinclair-McBride, K., & Spinelli, T. (2016). Longitudinal and incremental relation of cyber victimization to negative self-cognitions and depressive symptoms in young adolescents. *Journal of Abnormal Child Psychology, 44*(7), 1321–1332.

Craig, W., Lambe, L., & MacIver, T. (2015). Bullying and fighting. In. J. Freeman, M. King, & W. Pickett (eds.), *Health Behavior in School-aged Children (HBSC) in Canada: Focus on relationships.* Public Health Agency of Canada pub: 150150. Retrieved from: http://healthycanadians.gc.ca/publications/science-research-sciences-recherches/health-behaviour-children-canada-2015-comportements-sante-jeunes/index-eng.php#c15

Demirtas, H., Feels, S. A., & Yucel, R. M. (2008). Plausibility of multivariate normality assumption when multiply imputing non-Gaussian continuous outcomes: A simulation assessment. *Journal of Statistical Computation & Simulation, 78*(1), 69–84.

Didden, R., Scholte, R. H. J., Korzilius, H., De Moor, J. M. H., Vermeulen, A., O'Reilly, M., et al. (2009). Cyberbullying among students with intellectual and developmental disability in special education settings. *Developmental Neurorehabilitation, 12*(3), 146–151.

Do, C. (2012). *Aboriginal children and youths 'experiences of bullying and peer victimization in a Canadian context (unpublished doctoral dissertation)*. Ottawa: University of Ottawa Retrieved from: https://www.ruor.uottawa.ca/handle/10393/22683.

Donovan, D. M., Thomas, L. R., Sigo, R. L. W., Price, L., Lonczak, H., Lawrence, N., et al. (2015). Healing of the canoe: Preliminary results of a culturally grounded intervention to prevent substance abuse and promote tribal identity for native youth in two Pacific northwest tribes. *American Indian and Alaska Native Mental Health Research (Online), 22*(1), 42.

Eisenberg, M. E., Neumark-Sztainer, D., & Perry, C. L. (2003). Peer harassment, school connectedness, and academic achievement. *Journal of School Health, 73*(8), 311–316.

Espinoza, G. (2015). Daily cybervictimization among Latino adolescents: Links with emotional, physical and school adjustment. *Journal of Applied Developmental Psychology, 38*, 39–48.

Fletcher, A., Fitzgerald-Yau, N., Jones, R., Allen, E., Viner, R. M., & Bonell, C. (2014). Brief report: Cyberbullying perpetration and its associations with socio-demographics, aggressive behavior at school, and mental health outcomes. *Journal of Adolescence, 37*(8), 1393–1398.

Gamez-Guadix, M., Orue, I., Smith, P. K., & Calvete, E. (2013). Longitudinal and reciprocal relations of cyberbullying with depression, substance use, and problematic internet use among adolescents. *Journal of Adolescent Health, 53*(4), 446–452.

Gini, G., & Pozzoli, T. (2009). Association between bullying and psychosomatic problems: A meta-analysis. *Pediatrics, 123*(3), 1059–1065.

Goodkind, J., LaNoue, M., Lee, C., Freeland, L., & Freund, R. (2012). Feasibility, acceptability, and initial findings from a community-based cultural mental health intervention for American Indian youth and their families. *Journal of Community Psychology, 40*(4), 381–405.

Gracey, M., & King, M. (2009). Indigenous health part 1: Determinants and disease patterns. *The Lancet, 374*(9683), 65–75.

Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. *Prevention Science, 8*(3), 206–213.

Hare, J., & Pidgeon, M. (2011). The way of the warrior: Indigenous youth navigating the challenges of schooling. *Canadian Journal of Education, 34*(2), 93–111.

Hawkins, E. H., Cummins, L. H., & Marlatt, G. A. (2004). Preventing substance abuse in. American Indian and Alaska Native youth: Promising strategies for healthier communities. *Psychological Bulletin, 130*(2), 304–323.

Health Canada. (2014). *A statistical profile on the health of first nations in Canada: Determinants of health 2006–2010*. Ottawa: Health Canada Retrieved from: http://www.hc-sc.gc.ca/fniah-spnia/pubs/aborig-autoch/2010-stats-profil-determinants/index-eng.php.

Hinduja, S., & Patchin, J. W. (2007). Offline consequences of online victimization: School violence and delinquency. *Journal of School Violence, 6*(3), 89–112.

Hinduja, S., & Patchin, J. W. (2010). Bullying, cyberbullying, and suicide. *Archives of Suicide Research, 14*(3), 206–221.

Juvoven, J., & Gross, E. F. (2008). Extending the school grounds? Bullying experiences in cyberspace. *The Journal of School Health, 78*(9), 496–505.

Kenyon, D. B., & Hanson, J. D. (2012). Incorporating traditional culture into positive youth development programs with American Indian/Alaska native youth. *Child Development Perspectives, 6*(3), 272–279.

Kirmayer, L., Simpson, C., & Cargo, M. (2003). Healing traditions: Culture, community, and mental health promotion within Canadian aboriginal peoples. *Australasian Psychiatry, 11*(1), S15–S23.

Kisely, S., Alichniewicz, K. K., Black, E. B., Siskind, D., Spurling, G., & Toombs, M. (2016). The prevalence of depression and anxiety disorders in indigenous people of the Americas: A systematic review and meta-analysis. *Journal of Psychiatric Research*, 137–152.

Kowalski, R. M., Giumetti, G. W., Schroeder, A. N., & Lattanner, M. R. (2014). Bullying in the digital age: A critical review and meta-analysis of cyberbullying research among youth. *Psychological Bulletin, 140*(4), 1073.

LaFromboise, T. D., & Lewis, H. A. (2008). The Zuni life skills development program: A school/community-based suicide prevention intervention. *Suicide and Life-threatening Behavior, 38*(3), 343–353.

Le, T. N., & Gobert, J. M. (2015). Translating and implementing a mindfulness-based youth suicide prevention intervention in a native American community. *Journal of Child and Family Studies, 24*(1), 12–23.

Lee, K. J., & Carlin, J. B. (2010). Multiple imputation for missing data: Fully conditional specification versus multivariate normal imputation. *American Journal of Epidemiology, 171*(5), 624–632.

Lemstra, M., Rogers, M., Redgate, L., Garner, M., & Moraros, J. (2011). Prevalence, risk indicators, and outcomes of bullying among on-reserve first nations youth. *Canadian Journal of Public Health, 102*(6), 462–466.

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the depression Anxiety stress scales (DASS) with the Beck depression and Anxiety inventories. *Behavior Research and Therapy, 33*(3), 335–343.

MacCormack, J. (2014). Bullying and fighting behavior. In J. Freeman, H. Coe, & M. King (eds.), *Health Behavior in School Aged Children: Trends report* 1990-2010. Public Health Agency of Canada Pub: 130065. Retrieved from: http://www.phac-aspc.gc.ca/hp-ps/dca-dea/prog-ini/school-scolaire/behaviour-comportements/assets/pdf/trends-tendances-eng.pdf

McMahon, R., O'Donnell, S., Smith, R., Walmark, B., & Beaton, B. (2011). Digital divides and the 'first mile': Framing first nations broadband development in Canada. *The International Indigenous Policy Journal, 2*(2), 1–15.

Melander, L. A., Hartshorn, K. J. S., & Whitbeck, L. B. (2013). Correlates of bullying behaviors among a sample of north American indigenous adolescents. *Journal of Adolescence, 36*(4), 675–684.

Mishna, F., Saini, M., & Solomon, S. (2009). Ongoing and online: Children and youths' perceptions of cyberbullying. *Children & Youth Services Review, 31*(12), 1222–1228.

Modecki, K. L., Minchin, J., Harbaugh, A. G., Guerra, N. G., & Runions, K. C. (2014). Bullying prevalence across contexts: A meta-analysis measuring cyber and traditional bullying. *Journal of Adolescent Health, 55*(5), 602–611.

Moran, J. R., & Reaman, J. A. (2002). Critical issues for substance abuse prevention targeting American Indian youth. *Journal of Primary Prevention, 22*(3), 201–233.

National Academies of Sciences, Engineering, and Medicine. (2016). *Preventing bullying through science, policy, and practice*. Washington, DC: The National Academies Press.

Olweus, D. (1993). *Bullying at school: What we know and what we can do*. Williston, VT: Blackwell.

Patchin, J. W., & Hinduja, S. (2010). Cyberbullying and self-esteem. *Journal of School Health, 80*(12), 614–621.

Penn, J., Doll, J., & Grandgenett, N. (2008). Culture as prevention: Assisting high-risk youth in the Omaha nation. *Wicazo Sa Review, 23*(2), 43–61.

Rigby, K. (2003). Consequences of bullying in schools. *Canadian Journal of Psychiatry, 48*(9), 583–590.

Schumann, L., Craig, W., & Rosu, A. (2013). Minority in the majority: Community ethnicity as a context for racial bullying and victimization. *Journal of Community Psychology, 41*(8), 959–972.

StataCorp. (2015). *Stata statistical software: Release 14*. College Station: StataCorp LP.

Szabo, M. (2010). The short version of the depression Anxiety stress scales (DASS-21): Factor structure in a young adolescent sample. *Journal of Adolescence, 33*(1), 1–8.

Tokunaga, R. S. (2010). Following you home from school: A critical review and synthesis of research on cyberbullying victimization. *Computers in Human Behavior, 26*(3), 277–287.

Vaillancourt, T., Brittain, H., Bennett, L., Arnocky, S., McDougall, P., Hymel, S., et al. (2010). Places to avoid: Population-based study of student reports of unsafe and high bullying areas at school. *Canadian Journal of School Psychology, 25*(1), 40–54.

Waasdorp, T. E., & Bradshaw, C. P. (2014). The overlap between cyberbullying and traditional bullying. *Journal of Adolescent Health, 56*(5), 483–488.

Wang, J., Iannotti, R., & Nansel, T. R. (2009). School bullying among adolescents in the United States: Physical, verbal, relational, and cyber. *Journal of Adolescent Health, 45*(4), 368–375.

Weaver, H. (2009). The colonial context of violence: Reflections on violence in the lives of native American women. *Journal of Interpersonal Violence, 24*(9), 1552–1563.

Whitbeck, L. B., McMorris, B. J., Chen, X., & Stubben, J. D. (2001). Perceived discrimination and early substance abuse among American Indian children. *Journal of Health and Social Behavior, 42*(4), 405.