

# A longitudinal study of the social and emotional predictors and consequences of cyber and traditional bullying victimisation

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## Abstract

**Objectives** Few longitudinal studies have investigated how cyberbullying interacts with traditional bullying among young people, who are increasingly using online environments to seek information, entertainment and to socialise. This study aimed to identify the associations between the relative contribution of cyberbullying victimisation and traditional bullying victimisation on social and emotional antecedents and outcomes among adolescents.

**Methods** Participants were a cohort of 1,504 adolescents from 16 Australian schools followed from age 13 to 15 years.

**Results** Adolescents experiencing social and emotional difficulties were more likely to be cyberbullied and traditionally bullied, than traditionally bullied only. Those targeted in both ways experienced more harm and stayed away from school more often than those traditionally bullied only.

**Conclusions** These findings suggest a high coexistence of cyber and traditional bullying behaviours and their antecedents, and higher levels of harm from a combination of these behaviours for adolescents over time. Future research

should engage students as co-researchers to enhance school and parent strategies to support adolescents experiencing difficulties, and to reduce the likelihood of both cyber and traditional bullying.

**Keywords** Cyberbullying · Traditional bullying · Victimization · Cyberbullying perpetration · Social and emotional wellbeing · Adolescence

## Introduction

The use of new information and communication technologies (ICT) has increased on a global scale. In Western countries, most children and young people can easily access the Internet from home or other locations (Lenhart et al. 2010; Livingstone and Haddon 2009) and have access to a mobile phone or other devices with advanced media and communication capabilities (Li et al. 2012). This heightened connectivity provides many opportunities to access information and seek social support, but can give rise to problematic behaviours such as cyberbullying, particularly when children and adolescents use ICT to interact with peers.

‘Cyberbullying’ can be defined as a particularly damaging form of psychological aggression (Cross et al. 2009), that occurs when an individual or group uses ICT to intentionally and repeatedly harm a person, who finds it hard to stop this bullying from continuing (Smith et al. 2008). Such behaviours include nasty or threatening messages sent via the Internet or mobile phones, sharing others’ images or messages without permission, deliberate exclusion online, and pretending to be others to hurt or embarrass the target. Although international estimates of cyberbullying prevalence have varied, a recent review

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concluded that around 24 % of young people report being victimised online, and 17 % report perpetrating bullying behaviours online (Patchin and Hinduja 2012). This behaviour is particularly prevalent in early adolescence; in Australia, approximately 7 % of school students aged 8–14 years reported being cyberbullied, and 3.5 % reported cyberbullying others, on a frequent basis (every few weeks or more often) (Cross et al. 2009). A sizeable minority of young people, in most countries where this phenomenon has been studied, report engaging in cyberbullying and/or being targeted by these behaviours (Kowalski et al. 2014).

Cyberbullying, like more traditional forms of bullying (e.g. kicking, teasing, hitting), significantly affects adolescents' social, emotional and academic wellbeing. Adolescents victimised by their peers, in both online and offline settings, are more likely to report emotional distress, symptoms of anxiety and depression, social isolation, loneliness, and to demonstrate increased school absenteeism and poor academic achievement (Kowalski and Limber 2013; Landstedt and Persson 2014; Ortega et al. 2012; Sinclair et al. 2012). Adolescents who experience cyberbullying victimisation are more likely than non-victimised students to later report symptoms of depression (Gómez-Guadix et al. 2013; Schultze-Krumbholz et al. 2012), and cyber victimisation predicts more symptoms of depression compared to traditional bullying victimisation (Perren et al. 2010). This suggests that those who experience cyberbullying are at heightened risk of negative emotional consequences, perhaps due to features of the online environment that enable anonymity, wide audiences and 24/7 access (Patchin and Hinduja 2006). In addition, those who are cyberbullied are frequently also victims of traditional bullying behaviours (Cross et al. 2009; Riebel et al. 2009). In Australia, 87 % of students who experience cyberbullying also report traditional bullying victimisation, and 77 % who report cyberbullying others also report bullying peers in traditional ways (Cross et al. 2009), with similar findings emerging elsewhere (Dempsey et al. 2011; Erdur-Baker 2010; Jose et al. 2012; Kowalski et al. 2012; Raskauskas and Stoltz 2007; Sticca et al. 2013).

Given that traditional bullying involvement is itself a predictor of later involvement in cyberbullying (Hemphill et al. 2012; Sticca et al. 2013), and a dose response relationship exists whereby the greater the frequency of bullying behaviour, the greater the likelihood of negative outcomes for the target (Carney 2008), those targeted by both traditional and cyberbullying behaviours may represent a particularly vulnerable group of victimised students. Nevertheless, few longitudinal studies have compared the emotional and social outcomes for adolescents victimised by cyberbullying, traditional bullying, or both.

## Social and emotional risk factors for bullying and cyberbullying

Several interpersonal and emotional factors have also been implicated in young people's involvement in bullying. Adolescents with poor social wellbeing (e.g. low school connectedness, feelings of loneliness, poor friendship quality, less peer support) (Goldbaum et al. 2003; Lester et al. 2013) and externalising, internalising or other emotional problems are more likely to report being bullied by their peers (Goldbaum et al. 2003; Lester and Cross 2015). In a meta-analysis of 153 studies investigating individual and contextual factors associated with bullying perpetration and/or victimisation, Cook et al. (2010) identified unique social and emotional factors, including poor social competence, internalising behaviours, and externalising behaviours, associated with bullying perpetration or victimisation. Students involved in bullying were also more likely to report negative perceptions of the school environment. However, most studies included in the analysis were correlational rather than longitudinal.

Limited longitudinal data have explored the directionality of these sorts of associations, though a meta-analysis of longitudinal studies on the relationship between victimisation experiences and internalising problems demonstrated that victimisation predicted higher levels of internalisation at a later date, even when controlling for initial levels of internalisation (Reijntjes et al. 2010). In addition, higher levels of internalisation predicted the later experience of victimisation, regardless of whether victimisation had occurred at baseline (Reijntjes et al. 2010). Similarly, symptoms of depression have been shown to predict later cyberbullying victimisation (Gómez-Guadix et al. 2013). These findings may suggest a complex cyclical relationship between emotional problems and bullying experiences. Social and emotional difficulties may contribute to victimisation by impairing adolescents' behavioural and emotional regulation, self-esteem, and social skills (Riittakerttu et al. 2010), and this victimisation can in turn cause significant emotional distress and social isolation.

Nevertheless, the extent to which emotional and social problems differ as predictors of traditional and cyberbullying victimisation is currently unclear. Longitudinally, Williams and Guerra (2007) have identified shared predictors including normative beliefs about bullying, negative school climate, and negative peer support, whilst Hemphill et al. (2012) found that only previous engagement in relational aggression predicted both cyber and traditional bullying. Independent predictors of cyberbullying perpetration have included young people's frequency of online communication and involvement in non-cyberbullying behaviours (Sticca et al. 2013). Brighi et al.

(2012) found that lower family self-esteem among boys (e.g. the extent to which they felt important within their family), and higher loneliness in relation to parents among girls (e.g. spending time with parents), predicted cyber victimisation but not traditional victimisation. Further longitudinal research comparing the shared and unique predictors of these bullying behaviours is needed (Brighi et al. 2012; Hemphill et al. 2012).

The association of gender with longitudinal predictors and outcomes also needs further research, as the findings regarding gender and cyber/traditional bullying have been mixed. While some studies have indicated that boys are more likely to be perpetrators and victims in both cyber and traditional bullying incidents (Cook et al. 2010; Erdur-Baker 2010), others have found no relationship between gender and the likelihood of cyberbullying involvement (Hemphill et al. 2012; Patchin and Hinduja 2006; Schultze-Krumbholz et al. 2012; Sticca et al. 2013), or have suggested that girls are more likely to engage in cyberbullying and to be cyber victimised (Brighi et al. 2012; Li 2007). This latter finding may relate to the frequency of social media use, which is more extensive among girls (Barker 2009), as greater online communication predicts cyberbullying engagement (Sticca et al. 2013). Girls also report more negative emotional consequences of cyber victimisation than boys (Ortega et al. 2009; Schultze-Krumbholz et al. 2012), but the impact of gender on the social and emotional predictors and outcomes of combined cyberbullying and traditional bullying experiences are currently unclear.

### *Study aims*

Many of the social development theories of bullying behaviour have not been evaluated longitudinally in a cyber context. While debate as to whether cyberbullying is similar or different to traditional bullying will continue for some time, this study attempts to provide some evidence that these two behaviours are at least associated longitudinally. Hence, this study applies a social norms theory of bullying, suggesting that bullying shifts between face to face settings such as school to online and text environments due to the significant impact of normative perceptions on the behaviour of peers. Online environments, for example, may be used as another medium for the reinforcement of wider peer social norms or punishment of those who are perceived to violate peer norms (Espelage et al. 2013).

This study has also applied socio-ecological theory (Bronfenbrenner 1977) to identify and test key social and emotional (micro and meso) antecedents and impacts of cyberbullying behaviour, including factors that mediate the association between cyberbullying victimisation and gender. To effectively understand the factors that precede and

follow peer cyberbullying, this behaviour needs to be considered within the range of nested contextual systems in which it exists, including the dimension of time (the chronosystem), given the recent increase in young people's access to online environments (Espelage et al. 2013). This longitudinal study aims to determine if cyberbullying victimisation can be explained partly by individual and social environment characteristics, especially given the possible increase in cyberbullying as students transition from primary to middle or secondary school (Cross et al. 2009). Early adolescence appears to be a key period to study and to prevent student cyberbullying behaviours.

Hence, the primary aim of this study was to identify over a 3-year period in a cohort of post-transition 13-year-old students, the associations between the relative contribution of cyberbullying victimisation and traditional bullying victimisation on social and emotional antecedents and outcomes. Given the frequent co-occurrence of cyber and traditional bullying, it was hypothesised that a significant proportion of adolescents who reported being targeted by traditional forms of bullying behaviours would also report being cyberbullied. It was also expected that adolescents with more social and emotional difficulties would be more likely to experience both cyber and traditional bullying, and that the combined effects of experiencing both forms of bullying would result in more harm than being traditionally bullied only. Also, based on previous findings, it was hypothesised that girls would report higher levels of cyberbullying victimisation and perpetration than boys, whereas boys would report more involvement in traditional bullying. Finally, it was expected that girls would report more harms from both traditional and cyberbullying victimisation than would boys.

### **Method**

The data for this longitudinal panel study were collected from the non-intervention or comparison (usual care) group students who completed a confidential self-report online survey as part of the Cyber Friendly Schools Project (CFSP), a 3-year group randomised controlled trial conducted in 35 non-government Perth metropolitan secondary schools from 2010 to 2012. The CFSP tested the impact of an innovative online, whole-school and student-led cyberbullying prevention intervention on a cohort of grade 8 students (Cross et al. 2015).

#### **Demographics**

Of 53 eligible non-government secondary schools, 35 participated, 10 declined due to competing school priorities or participation in other research projects, and eight did not

respond. Recruited schools were stratified by school type (co-educational or single gender), school size and socio-economic status, and randomly assigned to the intervention and comparison study conditions. The sample for this paper was drawn from the 16 non-intervention (comparison group) schools. This non-intervention sample yielded 1,504 year 8 students at baseline (the start of the 2010 school year), 1,347 at Post 1 (the end of the 2011 school year), and 1,292 at Post 2 (the end of the 2012 school year). Nearly three quarters (74 %) of the comparison sample ( $n = 1,119$ ) completed all three data collections.

At the start of the 2010 school year, the parents of all the grade 8 students in the recruited study schools were asked to provide opt-in, and if no response opt-out (passive), consent for their son or daughter to participate in the study and complete a survey (Anderman et al. 1995; Chartier et al. 2008). At each school a staff member (school coordinator) was provided with pre-paid packaged envelopes (containing an information letter, consent form and reply paid envelope) to be mailed by the school to the parents. Parents who did not respond 2 weeks following the first two 'opt-in consent' mail contacts, were mailed a third follow-up letter requesting 'opt-out consent' for their grade 8 child to participate in the study, and a reply paid envelope to return the completed 'opt-out' consent form, if they did not want their child to participate.

## Measures

### *Forms of bullying victimisation*

To assess physical, relational, and verbal traditional victimisation, a ten item categorical index adapted from items/scales developed by Rigby and Slee (1998) and Olweus (1996) was used (average alpha = 0.90). To assess cyber victimisation, an eleven item categorical index (Cross et al. 2015) was used (average alpha = 0.91).

A definition and a series of images relating to cyberbullying was provided to students to increase their understanding of this term, prior to them completing these scales. The definition stated:

Cyberbullying is bullying using a mobile phone and/or the Internet e.g. when a person:

- Is sent nasty or threatening emails or messages on the Internet or their mobile phone
- Has mean or nasty comments or pictures about them sent to websites e.g. Facebook; MSN or to other students' mobile phones
- Is deliberately ignored or left out of things over the Internet

- Has someone else pretend to be them online to hurt them

Cyberbullying can happen through text messages/pictures/video-clips/emails etc. being sent to you, but also when these things are sent to others, about you.

The frequency with which students experienced each form of victimisation in the last term at school (past 10 weeks) was measured using a five-point scale recommended by Solberg and Olweus (2003) (1 = never, 2 = once or twice, 3 = every few weeks, 4 = about once a week, 5 = most days). A binomial variable was calculated for each student at each time point to indicate if they had been victimised every few weeks or more often, via traditional victimisation only, cyber victimisation only, or by both cyber and traditional victimisation.

### *Impact of victimisation*

Students reported how upset they felt the worst time they were bullied in the last term (10 weeks) at school with responses comprising: I was not bullied; not at all upsetting; a bit upsetting; quite upsetting; and very upsetting.

### *Help-seeking behaviour*

Students were asked to report to whom they spoke if they were bullied last term at school: a teacher, an adult at school, student leaders, an adult outside of school, and/or their siblings, or no-one.

### *Absenteeism*

Students were asked whether they stayed away from school during the past 10 weeks due to victimisation. A binomial variable was calculated from the responses: I was bullied but I did not stay away; I stayed away once or twice because I was bullied; I stayed away more than twice because I was bullied; and I was not bullied.

### *Social wellbeing*

*Peer support* The peer support at school scale (adapted from the 24-item Perceptions of Peer Social Support Scale; Ladd et al. 1996) comprised eleven items measured on a three-point scale (1 = never, 2 = sometimes, 3 = lots of times). A factor analysis performed on the adapted peer support scale confirmed its unidimensionality (CFI > 0.9, SMR < 0.10 at all time points). A peer support score at each time point was calculated for each student by averaging all items, with higher scores reflecting greater feelings of peer support (average alpha = 0.90).

**School connectedness** The connectedness to school scale comprised four items adapted from the Resnick et al. (Resnick et al. 1997) six-item School Connectedness Scale, measured on a five-point scale (1 = never, 2 = unsure, 3 = sometimes, 4 = usually, 5 = always). The unidimensionality of the adapted scale was confirmed in a factor analysis (CFI > 0.9, SMR < 0.10 at all time points). For each student at each time point an average school connectedness score was calculated, with a higher score reflecting greater feelings of connectedness to their school (average alpha = 0.82).

#### *Emotional wellbeing*

The Strengths and Difficulties Questionnaire (Goodman 1997) comprised 25 items measured on a three-point scale (0 = not true, 1 = somewhat true, 2 = certainly true). Five subscales (emotional symptoms, conduct problems, hyperactivity, peer problems, pro-social) and an overall score were calculated in accordance with the scale author's instructions. A higher score indicated greater problems for the emotional symptoms (average alpha = 0.70), conduct problems (average alpha = 0.40), hyperactivity (average alpha = 0.62) and peer problems (average alpha = 0.46) subscales. A higher score for the pro-social subscale indicated strong social skills (average alpha = 0.70).

#### Data collection

For each data collection, in May/June 2010, October 2011 and October 2012, trained research staff administered the online surveys to students during class time, according to a strict protocol. Students with consent were assigned a unique login ID and password to enter the survey site. Students without consent received alternative classroom activities. Students' confidentiality was maintained via their login ID numbers and teachers were asked not to look at students' responses. Survey completion rates were similar for intervention and comparison schools at all three data collection points: 2010 (intervention 89 %; comparison 85 %); 2011 (intervention 84 %; comparison 80 %); and 2012 (intervention 84 %; comparison 86 %).

Longitudinal data from only the CFSP comparison students were analysed for this paper. Just over a half of the students were girls (53 %) and 75 % of students lived in higher than average economically advantaged suburbs, with 14 % living in single parent families.

Ethics approval was granted by the Human Research Ethics Committee at Edith Cowan University and at each study school, as well as the Western Australian Catholic Education Office and the Association of Independent Schools of Western Australia non-government school sectors.

#### Data analysis

SPSS v 22 and Stata v 13 were used to analyse the data cross-longitudinally. Chi-square analysis was used to determine differences in gender and bullying prevalence, Internet and SNS use, predictors of victimisation and impacts of victimisation. Separate logistic regression models were used to determine the social wellbeing and emotional wellbeing predictors of cyber and traditional victimisation compared to traditional victimisation only, while accounting for school type (co-educational, boys only, and girls only schools) and Internet and SNS use. Post 1 (2011) models took into account baseline (2010) victimisation and social and emotional wellbeing. Post 2 (2011) models took into account Post 1 (2011) victimisation and social and emotional wellbeing. Separate ordinal (how upset) and logistic regression models (help-seeking, absenteeism) were used to determine the impact of cyber and traditional victimisation versus traditional victimisation, taking into account gender, school type and Internet and SNS use. Post 1 (2011) models took into account baseline (2010) victimisation. Post 2 (2012) models took into account Post 1 (2011) victimisation. A random intercept was included in each regression model to account for the clustering of students within schools. A comparison of 2010 cyber and traditional bullying prevalence showed there were no significant differences in prevalence rates between those who stayed in the study and those who dropped out of the study in 2011 and 2012.

**Table 1** Type of victimisation by gender and time point

	2010* (n = 1454)		2011* (n = 1314)		2012* (n = 1273)	
	Male % (n)	Female % (n)	Male % (n)	Female % (n)	Male % (n)	Female % (n)
Not bullied	29 (194)	23 (177)	40 (243)	28 (197)	46 (274)	35 (234)
Non-cyber victimisation only	51 (344)	45 (350)	43 (262)	38 (267)	34 (203)	37 (253)
Cyber victimisation only	2 (15)	2 (18)	3 (16)	2 (16)	2 (13)	3 (19)
Non-cyber and cyber victimisation	18 (124)	30 (232)	15 (89)	32 (224)	18 (105)	25 (172)

\*  $p < 0.01$  for gender

## Results

### Prevalence and forms of bullying victimisation

In 2010, 25 % of the student cohort reported being both cyber and traditionally victimised and 2 % reported cyber victimisation only (Table 1). The proportion of students reporting both traditional and cyber victimisation (22–25 %), and cyber victimisation only (2–3 %), remained relatively stable over the 3 years.

A significantly greater proportion of females than males reported being both cyber and traditionally bullied in each year of the study (2010:  $\chi^2 = 27.118$ ,  $p < 0.001$ ; 2011:  $\chi^2 = 56.649$ ,  $p < 0.001$  and 2012:  $\chi^2 = 20.639$ ,  $p < 0.001$ ). No significant differences were found in the proportion of females compared to males who experienced only cyber victimisation, or who experienced only traditional victimisation.

### Perceived severity of victimisation, help-seeking behaviour and absenteeism

For all three data collections in 2010–2012, approximately 40 % of the student cohort who reported being cyber

victimised only, or cyber and traditionally victimised, described their worst experience as ‘quite’ or ‘very’ upsetting (Table 2). This was particularly true for females, who were more likely than males to report their worst cyber and traditional bullying experience as ‘very’ upsetting (2010:  $\chi^2 = 23.623$ ,  $p < 0.001$ ; 2011:  $\chi^2 = 37.394$ ,  $p < 0.001$ ; 2012:  $\chi^2 = 18.365$ ,  $p < 0.001$ ).

For all 3 years, females compared to males (as they aged from 13 to 15 years) who were cyber victimised only or cyber and traditionally victimised, were more likely to report emotional problems (2010:  $F = 56.968$ ,  $p < 0.001$ ; 2011:  $F = 104.698$ ,  $p < 0.001$ ; 2012:  $F = 116.298$ ,  $p < 0.001$ ), and to speak to someone about their experiences of bullying (2010:  $\chi^2 = 11.179$ ,  $p = 0.001$ ; 2011:  $\chi^2 = 34.142$ ,  $p < 0.001$ ; 2012:  $\chi^2 = 16.929$ ,  $p < 0.001$ ). Also, females compared to males in 2011 and 2012 (aged 14 and 15 years) were also more likely to avoid school when they were cyber victimised or cyber and traditionally victimised (2011:  $\chi^2 = 10.067$ ,  $p = 0.002$ ; 2012:  $\chi^2 = 7.740$ ,  $p = 0.005$ ).

In terms of their social wellbeing strengths, and again for all three study years, females were more likely than males to report they had more peer support (2010:

**Table 2** Predictor and impact variables of victimisation by time point

	2010 % (n)	2011 % (n)	2012 % (n)
Severity of victimization <sup>abc</sup>			
Not at all upsetting	19 (109)	17 (72)	19 (61)
A bit upsetting	42 (243)	37 (156)	37 (118)
Quite upsetting	23 (132)	27 (115)	23 (73)
Very upsetting	17 (98)	19 (80)	22 (71)
Spoke to anyone about victimization <sup>abc</sup>			
Yes	69 (412)	70 (299)	60 (202)
No	31 (187)	30 (131)	40 (134)
Stayed away from school due to victimization <sup>bc</sup>			
Yes	15 (98)	23 (97)	23 (83)
No	85 (572)	77 (321)	77 (283)
	Mean (sd)	Mean (sd)	Mean (sd)
Peer Support (1–3) <sup>abc</sup>	2.5 (0.4)	2.5 (0.4)	2.5 (0.4)
School connectedness (1–5) <sup>a</sup>	3.2 (0.6)	3.1 (0.6)	3.1 (0.7)
SDQ			
Emotional Problems <sup>abc</sup>	2.5 (2.3)	2.8 (2.4)	2.9 (2.5)
Conduct Problems <sup>abc</sup>	1.8 (1.6)	1.9 (1.8)	1.9 (1.7)
Hyperactivity <sup>c</sup>	3.9 (2.2)	4.0 (2.3)	4.1 (2.3)
Peer problems <sup>ab</sup>	1.6 (1.7)	1.7 (1.8)	2.0 (1.8)
Pro-social <sup>abc</sup>	7.7 (2.0)	7.7 (2.2)	7.6 (2.2)
Total <sup>bc</sup>	9.8 (5.5)	10.5 (5.8)	10.9 (5.9)

<sup>a</sup> Significant gender differences at 2010

<sup>b</sup> Significant gender differences at 2011

<sup>c</sup> Significant gender differences at 2012

$F = 107.926$ ,  $p < 0.001$ ; 2011:  $F = 49.803$ ,  $p < 0.001$ ; 2012:  $F = 37.698$ ,  $p < 0.001$ ), more pro-social tendencies (2010:  $F = 120.661$ ,  $p < 0.001$ ; 2011:  $F = 135.741$ ,  $p < 0.001$ ; 2012:  $F = 156.244$ ,  $p < 0.001$ ), and fewer conduct problems (2010:  $F = 33.460$ ,  $p < 0.001$ ; 2011:  $F = 15.452$ ,  $p < 0.001$ ; 2012:  $F = 19.439$ ,  $p < 0.001$ ). Lastly, in 2010 (13 years of age) females reported more school connectedness than males ( $F = 6.815$ ,  $p = 0.009$ ).

#### Predictors of cyber and traditional bullying

Females were about twice as likely as males of the same age to be cyber and traditionally victimised, than only traditionally victimised in 2010 (aged 14 years, OR = 1.8) and 2011 (aged 15 years, OR = 2.0).

Students who reported feeling more connected to school had reduced odds of being cyber and traditionally bullied, compared to being traditionally bullied only (2010: OR = 0.7; 2011: OR = 0.5; 2012: OR = 0.5) (Table 3).

Students reporting emotional difficulties and peer problems were more likely to be both cyber and traditionally victimised, than traditionally victimised only in 2010 (OR = 1.1, OR = 1.1 respectively) and 2012 (OR = 1.1, OR = 1.3 respectively). Those reporting conduct problems were more likely to be cyber and traditionally victimised, compared to only traditional victimisation, in 2010 (OR = 1.1).

#### Impact of cyber and traditional bullying

For all 3 years of this study, the cohort students who reported they were cyber and traditionally bullied had an

increased odds of reporting this victimisation had a more severe impact on them, than those who only experienced traditional bullying (2010: OR = 2.7, 2011: OR = 4.3, 2012: OR = 10.3). These students also had a significantly greater odds of staying away from school (2010: OR = 3.4, 2011: OR = 2.6, 2012: OR = 5.1) than those who were traditionally bullied only (Table 4). There was no difference in help-seeking between those who were traditionally bullied only and those both cyber and traditionally bullied.

#### Discussion

While 27 % of students reported they were cyberbullied, the findings from this study indicate it was rare (2 %) for these students aged 13–15 years to report they were only cyberbullied. The data suggest that if students reported they were cyberbullied they almost always reported being traditionally bullied as well. Hence, our hypothesis that these two victimisation behaviours are highly associated was found to be true within this cohort. The high level of association between traditional bullying and cyberbullying may help to support a social norms theory of bullying, whereby young people make use of various opportunities to establish and maintain perceived normative behaviour. While the full temporal sequence of these cyber and traditional bullying experiences is difficult to determine with only 3 years of cohort data, it will be important for future longitudinal research to determine the sequential development and progression of students' experiences of cyberbullying and

**Table 3** Social and emotional predictors of non-cyber victimisation and cyber victimisation compared to non-cyber victimisation only by time

	2010 ( <i>n</i> ranges from 805 to 817)			2011 ( <i>n</i> ranges from 500 to 525)			2012 ( <i>n</i> ranges from 418 to 434)		
	OR	95 % CI	<i>P</i> value	OR	95 % CI	<i>P</i> value	OR	95 % CI	<i>P</i> value
Non-cyber and cyber victimisation									
Model 1–Social wellbeing									
Peer support	0.83	(0.52, 1.31)	0.417	0.92	(0.49, 1.75)	0.808	0.58	(0.29, 1.17)	0.130
Connectedness	0.69	(0.52, 0.92)	0.012*	0.56	(0.38, 0.81)	0.003**	0.61	(0.40, 0.95)	0.030*
Model 2–SDQ									
Emotional problems	1.12	(1.03, 1.21)	0.004**	1.11	(1.00, 1.23)	0.061	1.14	(1.05, 1.28)	0.046*
Conduct problems	1.13	(1.01, 1.26)	0.026*	1.10	(0.95, 1.26)	0.194	1.06	(0.96, 1.26)	0.569
Hyper	1.00	(0.93, 1.08)	0.966	0.99	(0.89, 1.11)	0.934	1.09	(0.89, 1.09)	0.217
Peer problems	1.14	(1.03, 1.26)	0.014*	1.12	(0.98, 1.29)	0.090	1.28	(1.10, 1.44)	0.003**
Prosocial	1.09	(0.99, 1.20)	0.081	1.05	(0.93, 1.18)	0.442	0.94	(0.84, 1.06)	0.385

\* Significant at 5 % level

\*\* Significant at 1 % level. Social wellbeing and SDQ models take into account gender, school type, internet use and SNS use

2011 models control for 2010 baseline social wellbeing and SDQ variables. 2012 models control for 2011 baseline social wellbeing and SDQ variables

Reference category is non-cyber victimisation only. OR is the odds of non-cyber and cyber victimisation versus non-cyber victimisation only

**Table 4** Impact of Non-cyber victimisation and cyber victimisation on perceived severity, absenteeism, and help-seeking behaviours compared to non-cyber victimisation only by time

	2010 ( <i>n</i> ranges from 342 to 427)			2011 ( <i>n</i> ranges from 222 to 269)			2012 ( <i>n</i> ranges from 178 to 209)		
	OR	95 % CI	<i>P</i> value	OR	95 % CI	<i>P</i> value	OR	95 % CI	<i>P</i> value
Non-cyber and cyber victimisation									
Severity of victimisation									
A bit upsetting	1.26	(0.71, 2.24)	0.426	0.90	(0.41, 1.98)	0.796	1.40	(0.54, 3.62)	0.492
Quite upsetting	1.76	(0.94, 3.30)	0.079	1.06	(0.46, 2.45)	0.896	1.87	(0.67, 5.20)	0.232
Very upsetting	2.73	(1.35, 5.55)	0.005**	4.30	(1.60, 11.20)	0.004**	10.29	(2.91, 36.31)	<0.001**
Stayed away from school	3.39	(1.61,7.16)	0.001**	2.56	(1.11,5.92)	0.027*	5.11	(1.92,13.60)	0.001**
Spoke to someone	0.88	(0.57,1.35)	0.551	1.62	(0.89,2.96)	0.117	0.65	(0.31,1.35)	0.245

\* Significant at 5 % level

\*\* Significant at 1 % level. All models take into account gender, school type, internet use and SNS use

2011 models control for 2010 baseline victimisation. 2012 models control for 2011 baseline victimisation

OR is the odds of non-cyber and cyber victimisation versus non-cyber victimisation only. Reference categories are 'not at all upsetting', did not stay away from school, did not speak to anyone

traditional bullying behaviour, especially when all students have similar access to technology.

Three quarters of the 13-year-old students in this study reported at baseline that they were cyber victimised and traditionally victimised, but this prevalence declined by about 15–60 % over the 3 years of the study, as these students reached the age of 15 years. While the proportion of students who reported being both cyber and traditionally bullied versus being cyberbullied only did not change over the 3 years of the study, significantly fewer students over time reported being traditionally bullied. This finding suggests that either the rates of traditional bullying naturally diminish over time among adolescents while cyberbullying behaviour remains stable, and/or current Australian school interventions designed to reduce bullying are moderating traditional bullying, with no noticeable effect on cyberbullying behaviour. Also, this finding could be related to adolescents' increasing reliance on digital media in their lives. Interestingly, the KIVA school-based intervention was found to lower both cyber and traditional bullying behaviour even though the program didn't directly target cyberbullying behaviour (Williford et al. 2013).

The stability of cyberbullying over time suggests this behaviour, unlike traditional bullying (Cross et al. 2009), may be more normative in older students. It will need to be monitored closely over more extended periods of time to understand for how long this level of cyberbullying continues and how it can be discouraged among older students. Further research is also needed to investigate how social information processing might explain the persistence of cyberbullying compared with traditional bullying. For example, whether being bullied online contributes to the development of a hostile attribution bias, which in turn

may lead to the perpetration of cyberbullying (Espelage et al. 2013).

Given Australian schools report low to moderate levels of whole-school bullying intervention implementation (Cross et al. 2011), with a large proportion of staff identified as not having sufficient skills to implement cyberbullying prevention whole-school and teaching and learning activities (Barnes et al. 2015; Cross et al. 2009), it is possible that this observed differential decline in traditional bullying prevalence is due to the limited implementation of cyberbullying prevention interventions compared to traditional bullying prevention interventions.

Consistent with research conducted by Tokunaga (2010) and Brighi et al. (2012), adolescent males and females in this study reported experiencing similar levels of traditional bullying through adolescence, yet females were approximately twice as likely compared to males to report being cyberbullied, either with or without experiences of traditional bullying. However, incongruous with social ecological theory, females in this study also reported they felt more connected to the school and that they had a greater sense of peer support than the males. This contradicts previous research showing that girls reported higher levels of cyberbullying victimisation and peer loneliness (Brighi et al. 2012), suggesting these constructs were among those factors identified as protective of bullying victimisation. Nonetheless, the higher rates of female cyber victimisation may be explained by the significantly greater time that females report spending online compared to males.

With previous research suggesting most cyberbullying behaviour occurs after school hours (Smith et al. 2008), when young people have more free time to use their mobile phones and access the Internet, school connectedness and



perceptions of peer support may not be as protective compared to when bullying occurs in school settings (Smith et al. 2008). To enhance the preventive actions of parents and schools as part of a socio-ecological approach to education, it will be important to continue to determine specifically what individual, social, school and community level factors delivered during which developmental windows are most protective against cyberbullying behaviour throughout childhood and late adolescence.

#### Predictors of both cyber and traditional bullying

As previously stated, in surprising contrast to females reporting higher levels of bullying than males, females were also more likely than males to report higher levels of school-related and individual protective factors for bullying prevalence (i.e. a higher sense of belonging or connectedness to school as well as higher levels of peer support or high-quality friendships (Goldbaum et al. 2003; O'Brennan and Furlong 2010). Females were also more likely to report being more pro-social and having fewer conduct disorders than males, which may in turn have boosted their school and interpersonal levels of support. Using a stress-coping model, Cassidy and Taylor (2005) suggest that young people who are bullied are more likely to exhibit psychological ill health if they use ineffective coping strategies or feel unsupported during the experience. Hence, the positive feelings reported by females may result from them being more likely than males to talk to others in school, family and peer environments about their difficulties, enabling them to feel more supported (Hunter et al. 2004). Further, girls' more frequent engagement in online social interactions compared to boys, may provide them with greater opportunities to build their peer support, particularly when the females were in grades 9 and 10 (Helsen et al. 2000). Therefore access to ICT while providing greater opportunities for peers to target others and even exacerbate peer conflicts, may also provide information and online support and help. This appears to be important given that cyberbullied students (compared to those traditionally bullied) are less likely to talk to an adult and more likely to try to manage the bullying on their own or in consultation with peers (Dooley et al. 2010; Smith et al. 2008).

#### Social and emotional difficulties

Consistent with other research and our hypothesis, those students in the overall sample who experienced emotional difficulties and/or peer problems were more likely to be cyber and traditionally bullied than cyberbullied only (Goldbaum et al. 2003; Lester and Cross 2015; Lester et al. 2013; Riittakerettu et al. 2010). Given the small proportion

of students who reported being 'only cyberbullied', similar to other findings (Raskauskas and Stoltz 2007), it was not possible to determine if these difficulties contributed to more cyber than traditional victimisation. However, significantly more students who reported emotional difficulties and peer problems also reported being cyber and traditionally victimised, than traditionally victimised only. Consequently, students experiencing peer and emotional difficulties are more likely to be victimised both online and offline, than offline alone. Identifying and supporting those students who experience these difficulties will be important for families and schools to reduce the likelihood of both cyber and traditional bullying.

#### Impact of cyber and traditional bullying

Students in this study were more likely to report that their victimisation experiences were severe and were more likely to deliberately stay away from school if they were both cyber and traditionally bullied compared to being only traditionally bullied. Given not all forms of cyberbullying appear to be equal in terms of their impact on the target (Smith et al. 2008), such that the effect of receiving a threatening text message is not the same as receiving a threatening message on a social networking site, then it follows that talking with students about the range of behaviours they are experiencing will be important when responding to their needs. Slonje and Smith (2008) reported that cyberbullying using images or video, for example, was found by students to be more severe than other forms of cyberbullying, due to the potential size of the audience and because the targets can be identified. As such the harm experienced may be exacerbated by the potential scale of the behaviour and may be largely social and emotional in nature.

From ages 13 to 15, females compared to males reported being more upset and having greater emotional difficulties related to bullying, yet were also more likely to tell someone. While it is possible that the more difficulties are experienced the more likely it is that a student will seek help, this increased help-seeking behaviour may also have occurred because girls were more likely to be cyber and traditionally bullied than boys. Interestingly, by age 14 and 15, girls were also more likely to report being absent from school as a result of their bullying experiences. As such absenteeism may be an important indicator for schools and families, especially among female students, of possible online/offline peer-related difficulties.

#### Strengths and limitations

The strengths of this study include its prospective longitudinal design, high consent and survey response rates, and analyses that accounted for the clustering of students in

schools. Despite this, these findings are somewhat limited by the non-government school population from which this sample was drawn, and the study's reliance on student self-report measures which are prone to biases that contribute to an inaccurate estimate of the prevalence of all forms of victimisation (Cornell and Bandyopadhyay 2010). Due to funding availability it was not possible to collect data at the end of 2009 and 2010 to enable equal time points for data collection. This may have contributed to some seasonal variation in the types of bullying reported. Lastly, the victimisation findings may be confounded by the multiple modalities used to assess the frequency of bullying in general. As such the students who experienced the same frequency of traditional bullying as those who experienced both cyber and traditional bullying may have experienced similar levels of impact, providing a limited understanding of the relative contribution of cyberbullying to this effect.

## Conclusion

With a quarter of students, especially females, reporting they are experiencing both cyber and traditional forms of bullying and the associated health, wellbeing and academic harms, it is clear these behaviours are a significant public health problem. They require evidence-based resources and a strong and consistent community and political response. The need is great to encourage and enable school staff and families to help prevent, identify earlier and adequately support adolescents who have social and emotional difficulties, to reduce the likelihood that they are bullied. These prevention and intervention strategies must seek and involve young people's voices to guide adults to be more knowledgeable and supportive.

This 3-year longitudinal study provides further evidence that cyberbullying nests closely with traditional bullying. As such schools and families need to be encouraged to see all these behaviours as harmful, and to implement policies and practices that deal with these behaviours together. Nonetheless, further studies are needed to test the applicability of these findings beyond this sample.

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