Bully/Victims: A Longitudinal, Population-based Cohort Study of Their Mental Health

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Abstract

It has been suggested that those who both bully and are victims of bullying (bully/victims) are at the highest risk for adverse mental health outcomes. However, unknown is whether most bully/victims were bullies or victims first and whether being a bully/victim is more detrimental to mental health than being a victim. 4101 children were prospectively studied from birth and structured interviews and questionnaires were used to assess bullying involvement at 10 years (elementary school) and 13 years of age (secondary school). Mental health (anxiety, depression, psychotic experiences) was assessed at 18 years. Most bully/victims at age 13 (n = 233) had already been victims at primary school (pure victims: n = 97, 41.6% or bully/victims: n = 47; 20.2%). Very few of the bully/victims at 13 years had been pure bullies previously (n = 7, 3%). After adjusting for a wide range of confounders, both bully/victims and pure victims, whether stable or not from primary to secondary school, were at increased risk of mental health problems at 18 years of age. In conclusion, children who are bully/victims at secondary school were most likely to have been already bully/victims or victims at primary school. Children who are involved in bullying behaviour as either bully/victims or victims at either primary or secondary school are at increased risk for mental health problems in late adolescence regardless of the stability of victimisation. Clinicians should consider any victimisation as a risk factor for mental health problems.

Keywords: Bully/victims; anxiety; depression; psychotic experiences; ALSPAC.

Introduction

Bullying is characterized by repetitive aggressive behaviour, engaged in by an individual or peer group with more power than the victim [1]. The repeated aggression can be either direct (e.g., name calling, beating) or relational with the intent to damage relationships (e.g., spreading rumours) [2]. In line with evolutionary theories, bullying may be a strategic attempt to gain a powerful and dominant position in the peer group [3,4]. Bullies have been described as strong, healthy children [5]; competent in emotion recognition [6] and effective in manipulating others [7]. Bullies may come from disturbed families, and are often deviant in their behaviour [8] but they are often strong and healthy children [5,9] who do not show emotional or physical problems [5,10]. A meta-analysis showed that bullies were at lower risk for psychosomatic problems than victims and bully/victims [11]. Bullying appears to yield personal benefits for bullies [9] without strong costs in the school setting [12].

This is in contrast to those that are the victims of bullying. Victims are at increased risk for developing a range of mental health problems [13] including depression and anxiety [14,15], psychotic experiences [16,17] and an increased risk of self-harm and attempting or completing suicide [18,19]. They are also more often alone [20] and rejected at school [21]. However, there are two distinct groups of victims of bullying: those who get victimized and do not bully others (pure victims) and those who get victimized but also bully others (bully/victims) [5]. Pure victims have a prevalence of around 20-30% compared to bully/victims (3-15%) in primary and early secondary school [22,23]. Bully/victims seem to possess the negative qualities of both bullies and victims. Similar to pure bullies they are often characterized by heightened aggression; on the other hand, similar to pure victims, they often display internalizing problems [24]. The two types of victims are rarely considered separately. When done, bully/victims seem to function less adaptively than bullies or victims [e.g. 25,26,27]. Bully/victims engage more often in suicidal behaviours [19] and suffer more health, economic and social problems in adulthood [10]. They are more socially isolated, lonely and less able to form friendships [28,29] and most likely to come from dysfunctional families [30]. These negative factors, rather than being a bully/victim per se, may explain why they are at increased risk for mental health problems [31]. It is important to understand whether bully/victims start off as pure victims (who imitate the bullying behaviour in an attempt to fight back), pure bullies (who lose their status) or whether they start of as being bully/victims. It has been suggested that victims have a high probability of engaging in bullying perpetration [27,32] and victimisation is more persistent than bullying [33]. Hence, it is possible that bully/victim status maybe more stable over time than pure victims or bullies and this chronic exposure to bullying rather than a specific bullying role may be

associated with mental health problems, in a dose-response manner [34]. It is thus important to identify whether specific roles taken in bullying behaviour or the chronicity of being bullied lead to mental health problems. Identifying such distinction may help increase the efficacy of bullying prevention and intervention efforts.

Our study builds on the existing literature in several ways. First, we make a distinction between pure victims and bully/victims. So far in the literature, the two types of victims are rarely considered separately. Secondly, we focus on the stability of bullying roles from the last year at elementary school (10 years) to secondary school (13 years). Opportunities to change bullying status roles are most likely when children change schools and this occurs for all children when they transition from elementary to secondary school [35]. It provides the opportunity for building a new social structure where students can develop new friendships and re-define their place in a new social hierarchy [36]. This allows for escaping bullying victimisation or changes in bully status groups. Lastly, the wealth of background information available in this cohort allows for adjusting for a comprehensive range of potential confounding variables such as parenting behaviour, domestic violence, pre-existing internalizing and externalizing problems along with previous diagnosable psychiatric disorders, all of which have previously been linked to bullying experiences [37,30] and mental health problems [38,39].

The aim of this manuscript is to identify the stability of bullying roles from the last year at elementary school (10 years) to secondary school (12 years) and their impact on mental health problems at 18 years of age. More specifically, our research questions include; 1) How stable are victim and bully-victim roles despite changing social context? Did bully/victims in secondary school start off as bully/victims in elementary school, or were they bullies who lost status and got victimized or victims who started to fight back?; 2) Are bully/victims at higher risk for mental health problems at 18 years of age than victims or is the risk for mental health problems mainly increased due to stable/chronic victimisation irrespective of whether they were victims or bully/victims in childhood?

METHODS

Participants

The Avon Longitudinal Study of Parents and Children (ALSPAC) is a birth cohort study, set in the UK, examining the determinants of development, health and disease during childhood and beyond [40]. Briefly, women who were residents in Avon while pregnant, and had an expected delivery date between April 1, 1991 and December 31, 1992 were approached to participate in the study, leading to 14,775 live births and 14,701 alive at 1 year of age. Please note that the study website contains details of all of the data that is available

through a fully searchable data dictionary: http://www.bris.ac.uk/alspac/researchers/data-access/data-dictionary/. 5,217 participants attended the 18 year assessment and 4,566 completed the mental health assessment. The current study includes 4,101 cohort participants (2285 girls, 55.7%) who continued with the study at age 18 and for whom data were available on early reports of bullying. However, the number of participants was reduced when all confounders were added to the model. Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees.

Predictor Variables

Bullying variables were constructed from child and mother reports at 10 and 13 years. Child reports were collected using the previously validated *Bullying and Friendship Interview Schedule* [34]. Five questions were asked about experience of *overt* bullying (for giving *and* receiving): personal belongings taken; threatened or blackmailed; hit or beaten up; tricked in a nasty way; called bad/nasty names; and four questions (for giving *and* receiving) about *relational* bullying: exclusion to upset the child; coercive pressure to do things s/he didn't want to; lies/nasty things said about others; games spoilt. Victimisation was coded as present if the child confirmed that any of the bullying behaviours occurred repeatedly (4 or more times in the past six months) or very frequently (at least once per week in the past six months). The same criteria were applied for bullying perpetration. Mother reported victimisation and bullying was assessed by a single item of the Strengths and Difficulties Questionnaire [41]: "child is picked on or bullied by other children" and "in the past year the child has bullied or threatened someone". If the response was "applies somewhat" or "certainly applies", the child was considered a mother-reported victim or bully [18].

Being bullied or bullying others was counted if reported either by the parent or the child [42]. Parent child agreement ($_K$ = 0.14 at age 10 and $_K$ = 0.20 at age 13) was similar to those reported previously [43]. Although this agreement may seem low, a large meta-analysis of parent child reports of behavioural and emotional functioning shows similar concordance levels [44]. All participants were categorized as pure victims, pure bullies, bully/victims (those who both bully and get victimized), or neutrals (those who are not involved in bullying behaviour).

Moreover, subgroups to identify chronic victimisation were created: 1) stable neutrals (children who were not involved in bullying behaviour at any time point), 2) unstable bully/victims (children who were a bully/victim at one time point only) and stable bully/victims (children who were bully/victims at both time points), 3) unstable pure victims (children who were a pure victim at one time point only) and stable pure

victims (children who were a pure victim at both time points), 4) unstable any victims (children who were bully/victims or pure/victims at one time point only) and stable any victims (children who were bully/victims or pure/victims at both time points). Subgroups of bully/victimisation were also created (Online Resource 1).

Outcome Variables

Psychotic experiences age 18: The Psychosis-Like Symptom interview (PLIKSi) is a semi-structured instrument that draws on the principles of standardized clinical examination developed for the Schedule for Clinical Assessment in Neuropsychiatry [SCAN; 45]. Trained psychology graduates asked 11 'core' questions eliciting key psychotic experiences occurring since age 12, covering hallucinations, delusions, and experiences of thought interference. Interviewers rated experiences as not present, suspected, or definitely present. We classed individuals as having psychotic experiences if they reported suspected or definite psychotic experiences not attributable to the effects of sleep or fever [46].

ICD-10 diagnoses of depression and anxiety at age 18: Participants completed a self-administered computerized version of the Clinical Interview Schedule [CIS-R; 47]. CIS-R enables diagnoses according to the International Statistical Classification of Diseases, 10th Revision (ICD-10) for common mental disorders. For *depression*, a binary variable (depressed, not depressed) was used. *Anxiety* was a binary variable indicating presence versus absence of any generalized anxiety disorder, social phobia, specific (isolated) phobia, panic disorder, or agoraphobia. *Any mental health problem* consisted of any psychotic experience, depression or anxiety at age 18.

Potential Confounders

A *preschool maladaptive parenting* variable was constructed using mother reported hitting (daily or weekly at 2 and/or 3.5 years), shouting (daily at 2 and/or 3.5 years) and hostility [48]. Maladaptive parenting was categorized as: none, mild (1 or 2 indicators) and severe (3 indicators) [49]. *Domestic violence* was considered present if mother/partner reported there was emotional and/or physical domestic violence (0.7, 1.8, 2.8, 4 years) and/or conflictual partnership (2.8 years, e.g., 'shouting or calling partner names') [50]. Multiple family risk factors (e.g. financial difficulties, crime involvement) were assessed during pregnancy with the *Family Adversity Index (FAI)* [50]. *Internalizing/externalizing behaviour problems* were estimated using the sum of negative emotionality, hyperactivity and conduct problems taken from the Strengths and Difficulties Questionnaire [41] reported by the mothers at 8, 9.5 and 11.6 years. Diagnostic and Statistical Manual of Mental

Disorders – IV (DSM-IV) *psychiatric diagnoses* were made at age 7 using the Development and Well-Being Assessment [DAWBA; 51] based on parent and teacher reports. The presence of any Axis I diagnosis of attention-deficit/hyperactivity disorder, conduct disorder, oppositional defiant disorder, depression, or anxiety vs. no diagnosis were considered.

Statistical Methods

Characteristics of the sample can be found in Table 1. We identified those who were bully/victims at age 13 (n = 233) and determined their starting status at age 10 (Figure 1). We ran multinomial regression analysis to statistically determine the odds of children remaining in their role (e.g. bully/victims) between 10 and 13 years compared to neutrals by 13 years (Table 2). To examine bully status roles at 10 and 13 years and the odds of developing mental health problems by age 18 (compared to neutral children), binary logistic regression analysis were run (Table 3). The models controlled for sex, any axis I diagnosis at age 7, concurrent internalizing/externalizing behaviour at 8, 9.5 and 11.6 years, family adversity during pregnancy, preschool maladaptive parenting, and preschool domestic violence. We then explored whether being a stable victim, stable bully/victim or any stable victim (either bully/ victim or pure victim) increased the odds of mental health problems at age 18 beyond being victim or a bully/victim at one time point (Table 4).

RESULTS

Descriptive statistics

Table 1 describes the sample. With regard to family environment, 285 (7.6%) children experienced severe maladaptive parenting and 1214 (31.3%) witnessed domestic violence. 1962 (50.5%) children had at least 1 family adversity. A DSM-IV diagnosis at age 7 was reported for 204 (n = 5.7%) of children. At age 18, 7.0% (n = 274) had psychotic experiences, 296 (7.8%) had depression, 376 (9.9%) had an anxiety disorder with overall 720 (17.6%) children who had any of these mental health problems.

[Insert Table 1]

Who are the bully/victims at secondary school?

Figure 1 shows all bully/victims at 13 (n = 233 with data available at age 10 and 13) and to which bullying status group they belonged at age 10 (primary school). The largest proportion of bully/victims at age 13 had been pure victims (n = 97, 41.6%) followed by neutrals, i.e. not involved in bullying previously (n = 82, 35.2%)

and finally bully/victims (n = 47; 20.2%) at age 10. Very few of the bully/victims at 13 years had been pure bullies previously (n = 7, 3%). Overall, 61.8 % of all bully/victims at 13 years of age had been any victims (victims, bully/victims) at 10 years of age. Multinomial regression analyses showed that bully/victims (OR: 10.97; 95% CI: 7.14-16.84), followed by victims (OR: 4.24 (3.09-5.81)) and then bullies (OR: 3.22 (1.39-7.45)) at age 10 years had increased odds to remain or become bully/victims at age 13 compared to neutrals (Table 2). Details of all bully/victim changes and their frequencies are shown in Online Resource 1.

[Insert Figure 1 & Table 2]

Bullying status roles at 10 and 13 years and mental health problems at 18 years:

After adjustment for a range of confounders, both bully/victims and pure victims at ages 10 and 13 were at increased risk for developing mental health problems at age 18 compared to neutrals (Table 3). Overall bully/victims were slightly more likely to have any mental health problem at age 18 than pure victims. However, there was no significant difference between bully/victims and pure victims. There was no significant association between being a pure bully and mental health problems. However, the numbers of bullies were small even in this large sample.

[Insert Table 3]

Chronicity of bully/victim or victim status role and mental health problems at 18 years:

Multinominal regressions were conducted to compare stable (or chronic) victimisation and unstable victimisation to those who were not involved in bullying in predicting mental health outcomes at age 18. Independent of victimisation status (pure victim or bully/victim), those who were unstable or stable victims were at increased risk for psychotic experiences, depression and any mental health problems (Table 4). No significant association was found between stable bully/victimisation and anxiety problems at age 18. Being a stable pure victim or any victim slightly increased the risk of anxiety problems. Direct comparison between stable and unstable victimisation indicated that having been a victim at any time point had similar long term impact on mental health problems at age 18. When bully/victim subgroups were analysed separately; those who were bully/victims by 13 years of age (independent of whether they were neutrals, pure victims or pure bullies at age 10) were at increased risk for psychotic experiences, depression and any mental health problems at age 18 (Online Resource 2).

[Insert Table 4]

DISCUSSION

This study investigated the transition from the last year of primary school (10 years) to established social relationships in secondary school (13 years) and examined where bully/victims came from and whether they were at increased risk for mental health problems at age 18 compared to victims. Our results show, firstly, that most bully/victims in secondary school had been victims or bully/victims already at age 10, in elementary school. Considered from a probabilistic view, bully/victims at age 10 were most likely to remain as bully/victims at age 13. They are unlikely to be bullies who were now being victimized. Secondly, we found that bully/victims were at increased risk for developing mental health problems, in particular psychotic experiences and depression by early adulthood compared to those not involved in bullying. However, similar adverse effects on mental health were found for victims of bullying. Thirdly, although, there was some suggestion of a dose-response relationship, when tested no significant difference between stable or unstable victimisation was found. Thus being the target of bullying at any time in school has adverse long term effects on mental health [52].

Bully/victims at age 13 were most likely to be already victims or bully/victims at age 10. Indeed, it has been suggested that victims are more likely to display bullying perpetration rather than bullies to become victims [32]. In other words, victims have a high probability of engaging in bullying perpetration [27]. There is thus moderate and significant stability of victimisation by peers over time even in changing contexts [53,27]. This stability may be due to being victimized having worked itself into the brain, altering social cognition or neuro-circuitry or physiological stress response [54,55]. Indeed, it has been shown that chronic victimisation may results in increased inflammation markers [9]. Moreover, chronic victimisation may introduce a range of cognitive biases. Children who are bullied have been shown to have numerous biases in cognitive processing, e.g., deeper encoding of negative information in memory or interpretation of ambiguous material as negative [6]. These cognitive biases may render an individual susceptible to the self-defeating ideations of depression [56] as well as having an increased negative attitudes and beliefs about themselves [24]. Moreover, being bullied may lead to a conditioned fear response [57] which may contribute to a heightened expectation of threat and danger [58]. These changes in the stress response system may increase the levels of impulsivity and aggression [59] as well as symptoms of depression [56] which may lead victim to try and fight back and/or get

further victimized or to show emotional reactions such as crying or running away that make them more likely targets even in changed social settings.

Similar to previous findings [27,32], our results further indicate that victims (bully/victims or pure victims) were at increased risk for a range of mental health problems. Victims struggle with friendships [24] and are more socially isolated and lonely [29,60,26]. This may hinder their ability to form strong prosocial bonds with other children and limit their opportunities for developing social skills or receiving support. The alienation from their peers may increase the likelihood of internalizing problems [61]. Indeed, both bully/victims and pure victims showed increased rates of depression. Additionally, increased depression may increase the vulnerability for the emergence of psychotic experiences [62]. On the other hand, contrary to previous literature [63], chronic bully/victims did not have increased risk for anxiety problems at age 18. This is in line with literature suggesting that pure victims are anxious children whereas bully/victims display more impulsivity [24]. However, our results showed that unstable bully/victims were still at increased risk for anxiety problems. This may be due to unstable bully/victim category encompassing pure victims at one time point. It has been suggested that children who are chronically victimized by their peers may be different from those who are occasionally victimized in terms of risk and outcomes [37]. Indeed, previously we reported that chronic victimisation in elementary school was associated with increased depression scores in early adolescence [14]. However, it was not associated with increased DSM-IV diagnosis of depression. Few previous studies directly compared unstable to stable victims; Scholte et al. [64] reported that stable victims did not have for more problematic behaviour profiles in adolescence than unstable victims. Similarly, although the frequency count suggests more frequent mental health problems at 18 years for chronic victims, direct comparison between unstable and stable victim groups did not reach significance. It may be that stable victimisation may have adverse impact on increasing depression or anxiety symptoms, i.e. shifting the distribution of scores [14] and impair functioning in social settings such as wealth and employability in adulthood rather than mental health per se [10]. However, here as previously [14], no significant difference in clinical diagnoses between those who were chronically or unstably victimized were found.

Finally, similar to previous studies in other cohorts [42,9,10], we did not find that bullies had an increased risk of mental health problems once confounders were taken into account. However, bullies are the smallest group in prevalence studies and despite the large sample size, there were relatively small numbers of children

reporting to be a pure bully at 10 or 13 years of age (2.5% and 3.3% respectively). Thus this finding needs to be interpreted with caution.

Our study has a number of strengths. We used a large population-based prospective cohort which minimizes selection biases. We used multiple informants of peer victimisation and controlled for a wide range of confounders associated with both bulling and mental health problems. With regard to limitations, firstly, not all children had data available on bullying. Nevertheless, empirical simulations demonstrate that even when dropout is correlated to predictor/confounder variables, the relationship between predictors and outcome is unlikely to be substantially altered by selective dropout processes [65]. Secondly, mothers reported victimisation with a single item which might have limited the reliability compared to the more comprehensive child interview. Nevertheless the results from child and mother reports were similar and thus not reported separately here.

In conclusion, **c**hildren who are bully/victims at secondary school were most likely to have been already bully/victims or victims at elementary school. Children who are involved in bullying behaviour as either bully/victims or victims at either elementary or secondary school are at increased risk for mental health problems in late adolescence regardless of the stability of victimisation. Targeted interventions should focus on improving the ways in which children cope with bullying and teachers and educational psychologists should be aware of bullying as a risk factor for mental health problems. Interventions should include families to strengthen supportive involvement and open communication between children and parents [66]. Lastly, in order to mitigate the negative effects of bullying behaviour, future research should investigate bullying involvement at a younger age to identify children who are prone to becoming victimized.

Acknowledgments

We are extremely grateful to all the families who took part in this study, the midwives for their help in recruiting them, and the whole ALSPAC team, which includes interviewers, computer and laboratory technicians, clerical workers, research scientists, volunteers, managers, receptionists and nurses. The UK Medical Research Council and the Wellcome Trust (Grant ref: 102215/2/13/2) and the University of Bristol provide core support for ALSPAC. Drs. Lereya and Wolke had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Drs. Lereya and Wolke's work on this study was supported by the Economic and Social Research Council (ESRC) grant ES/K003593/1. Dr. Copeland's work was supported by the National Institute of Mental Health (MH63970, MH63671, MH48085), the National Institute on Drug Abuse (DA/MH11301), NARSAD (Early Career Award), and the William T Grant Foundation. The funding bodies did not have any further role in the collection, analysis or interpretation of data, the writing of this manuscript, or the decision to submit this manuscript for publication. None of the authors have any conflicts of interest in relation to this work. The content is solely the responsibility of the authors and it does not reflect the views of the ALSPAC executive. Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees. The authors declare that they have no conflict of interest.

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Table 1: Selected Sample Characteristics

	4,101 sample n (%)	Larger sample n (%)	Selected sample vs. larger sample OR (95% CI)
Gender			
Male	1816 (44.3)	5724 (54.1)	[reference]
Female	2285 (55.7)	4864 (45.9)	**1.48 (1.38 – 1.59)**
Maladaptive Parenting			
None	1499 (39.8)	2594 (38.1)	[reference]
Mild	1983 (52.6)	3710 (54.5)	.93 (.85 – 1.01)
Severe	285 (7.6)	509 (7.5)	.97 (.83 – 1.14)
Domestic Violence			
No	2670 (68.7)	5317 (64.3)	[reference]
Yes	1214 (31.3)	2952 (35.7)	**.82 (.76 - .89)**
FAI [a]			
None	1923 (49.5)	3409 (36.7)	[reference]
1 or more adversities	1962 (50.5)	5872 (63.3)	**.59 (.55 - .64)**
Total Internalizing & Externalizing Problems, mean (SD)	15.41 (9.79)	17.17 (10.86)	.98 (.98 - .99)
Any Axis I disorder (DAWBA) [b]			
No	3400 (94.3)	4230 (92.1)	[reference]
Yes	204 (5.7)	361 (7.9)	**.70 (.59 – .84)**
Psychotic experiences at age 18			
No	3655 (93.0)	691 (87.4)	[reference]
Yes	274 (7.0)	100 (12.6)	**.52 (.41 – .66)**
Depression Symptoms at age 18			
No	3512 (92.2)	694 (91.6)	[reference]
Yes	296 (7.8)	64 (8.4)	.91 (.69 – 1.21)
Anxiety Symptoms at age 18			
No	3432 (90.1)	667 (88.0)	[reference]
Yes	376 (9.9)	91 (12.0)	.80 (.63 – 1.02)
Any Mental Health Problem at age 18 [c]			
No	3381 (82.4)	647 (77.4)	[reference]
Yes	720 (17.6)	189 (22.6)	**.73 (.61 – .87)**
Bullying Status at 10			
Neutral	2250 (61.5)	1351 (58.2)	[reference]
Bully/Victim	260 (7.1)	256 (11.0)	**.61 (.51 - .73)**
Pure Victim	1059 (28.9)	630 (27.1)	1.01 (.90 – 1.14)
Pure Bully	90 (2.5)	84 (3.6)	**.64 (.47 - .87)**
Bullying Status at 13			
Neutral	2151 (62.5)	1062 (60.5)	[reference]
Bully/Victim	278 (8.1)	171 (9.7)	**.81 (.65 - .98)**
Pure Victim	901 (26.2)	429 (24.5)	1.04 (.91 – 1.19)
Pure Bully	114 (3.3)	92 (5.2)	**.61 (.46 - .81)**
Chronicity Pure Victim Status			
Stable Neutral	1397 (52.8)	607 (54.5)	[reference]
Unstable pure victim	914 (34.5)	382 (34.3)	1.04 (.89 – 1.21)
Stable pure victim	337 (12.7)	125 (11.2)	1.17 (.93 – 1.47)
Chronicity Bully/Victim Status			
Stable Neutral	1397 (79.1)	607 (75.1)	[reference]
Unstable bully/victim	323 (18.3)	165 (20.4)	.85 (.69 – 1.05)
Stable bully/victim	47 (2.7)	36 (4.5)	.57 (.36 – .89)

Note: Boldface type indicates significant associations. [a] FAI, Family Adversity Index; [b] DAWBA, Development and Well-being Assessment at 7 years; [c] consisting of psychotic experience, depression and/or anxiety disorder; [d] Any victim consists of pure victims and/or bully/victims.

Table 2: The Association between Bully Status Group at 10 and Becoming a Bully/Victim, Pure Victim or Pure Bully Compared to Neutral Changing into Each of Those Status Groups at Age 13 (n = 3002)

	Bullying involvement at age 13					
		Bully/Victim (n = 233)		**Pure Victim (n = 779)**		**Pure Bully (n = 93)**
	No (%) [1]	**OR (95% CI)**	**No (%) [2]**	**OR (95% CI)**	**No (%) [3]**	**OR (95% CI)**
Bullying involvement at age 10						
Neutral (n= 1887)	82 (4.3)	[reference]	356 (18.9)	[reference]	52 (2.8)	[reference]
Bully/Victim (n = 209)	47 (22.5)	**10.97 (7.14 – 16.84)**	71 (34.0)	**3.82 (2.70 – 5.40)**	18 (8.6)	**6.62 (3.69 – 11.90)**
Pure Victim (n = 841)	97 (11.5)	**4.24 (3.09 – 5.81)**	337 (40.1)	**3.39 (2.81 – 4.09)**	17 (2.0)	1.17 (.67 – 2.05)
Pure Bully (n = 65)	7 (10.8)	**3.22 (1.39 – 7.45)**	15 (23.1)	1.59 (.86 – 2.93)	6 (9.2)	**4.36 (1.76 – 10.78)**

The number of neutrals at age 13 is 1897; [1] Number (percentage) of individuals turning into bully/victims at age 13; [2] Number (percentage) of individuals turning into pure victims at age 13; [3] Number (percentage) of individuals turning into pure bullies at age 13; Reference: neutrals

Table 3: Bully Status Groups at 10 Years of Age and Mental Health Problems at 18 Years Adjusted for Confounders*

	Psychotic Experiences		Depression		Anxiety		Any Mental Health	
Bullying Status	**No (%)** [2]	**OR (95% CI)**	**No (%)** [2]	**OR (95% CI)**	**No (%)** [2]	**OR (95% CI)**	**No (%)** [2]	**OR (95% CI)**
10 years		(n=2746)		(n=2674)		(n=2674)		(n=2862)
Neutral	77 (4.5)	[reference]	96 (5.8)	[reference]	134 (8.0)	[reference]	242 (13.6)	[reference]
Pure Victim	78 (10.0)	**2.12 (1.51 – 2.97)**	71 (9.4)	**1.55 (1.11 – 2.16)**	87 (11.5)	**1.38 (1.03 – 1.86)**	181 (22.3)	**1.68 (1.35 – 2.11)**
Pure Bully[1]	4 (6.2)	1.27 (.45 – 3.64)	3 (4.6)	.71 (.22 – 2.35)	5 (7.7)	.88 (.34 – 2.27)	11 (16.2)	1.09 (.55 – 2.13)
Bully/Victim	29 (15.4)	**3.28 (1.98 – 5.43)**	27 (14.8)	**2.61 (1.56 – 4.37)**	26 (14.2)	**1.71 (1.03 – 2.82)**	54 (27.0)	**2.08 (1.43 – 3.04)**
13 years		(n=2543)		(n=2467)		(n=2467)		(n=2653)
Neutral	69 (4.3)	[reference]	77 (4.9)	[reference]	107 (6.9)	[reference]	205 (12.3)	[reference]
Pure Victim	72 (10.9)	**2.50 (1.76 – 3.57)**	64 (9.8)	**1.91 (1.33 – 2.73)**	83 (12.7)	**1.92 (1.40 – 2.63)**	166 (23.9)	**2.14 (1.69 – 2.72)**
Pure Bully[1]	4 (4.9)	.99 (.35 – 2.83)	6 (7.5)	1.45 (.60 – 3.51)	9 (11.3)	1.59 (.75 – 3.35)	12 (13.3)	.99 (.52 – 1.89)
Bully/Victim	24 (12.8)	**2.91 (1.75 – 4.85)**	25 (14.3)	**3.00 (1.79 – 5.02)**	21 (12.0)	**1.76 (1.04 – 2.96)**	55 (28.2)	**2.72 (1.89 – 3.92)**

Confounders included: sex, any axis I diagnosis at age 7, internalizing/externalizing behaviour at 8, 9.5 and 11.6 years, family adversity, preschool maladaptive parenting, and preschool domestic violence. Boldface indicates that the 95% CI does not include 1.00. [1]Small number of bullies – requires cautious interpretation; [2] refers to the number of children who have the associated mental health problem

Table 4: Stability of Being I. Bully/Victim, II. Pure Victim, or III. Any Victim in Childhood and Mental Health Problems at 18 Years

		Psychotic Experiences		Depression		Anxiety		Any Mental Health	
		No (%) [2]	**OR (95% CI)**	**No (%)** [2]	**OR (95% CI)**	**No (%)** [2]	**OR (95% CI)**	**No (%)** [2]	**OR (95% CI)**
I.	**Chronicity Bully/ Victim**		(n = 1431)		(n = 1381)		(n = 1381)		(n = 1488)
	Stable Neutral	35 (3.1)	[reference]	41 (3.8)	[reference]	64 (5.9)	[reference]	120 (10.3)	[reference]
	Unstable Bully/Victim	35 (12.7)	**4.15 (2.40 – 7.16)**	33 (12.8)	**4.00 (2.32 – 6.92)**	34 (13.2)	**2.26 (1.37 – 3.72)**	74 (25.6)	**2.93 (2.04 – 4.23)**
	Stable Bully/Victim	6 (18.8)	**5.28 (1.89 – 14.76)**	6 (19.4)	**5.94 (2.05 – 17.20)**	2 (6.5)	.83 (.18 – 3.78)	12 (36.4)	**4.28 (1.93 – 9.50)**
	Unstable Bully/Victims vs.	35 (12.7)	(n=308)	33 (12.8)	(n = 288)	34 (13.2)	(n = 288)	74 (25.6)	(n = 322)
	Stable Bully/Victims	6 (18.8)	1.41 (.51 – 3.91)	6 (19.4)	1.50 (.52 – 4.37)	2 (6.5)	.31 (.06 – 1.50)	12 (36.4)	1.54 (.66 – 3.59)
II.	**Chronicity Pure Victim**		(n = 2149)		(n = 2092)		(n = 2092)		(n = 2233)
	Stable Neutral	35 (3.1)	[reference]	41 (3.8)	[reference]	64 (5.9)	[reference]	120 (10.3)	[reference]
	Unstable Pure Victim	68 (8.9)	**2.66 (1.73 – 4.09)**	75 (10.1)	**2.57 (1.71 – 3.86)**	90 (12.2)	**2.03 (1.43 – 2.87)**	173 (21.8)	**2.24 (1.72 – 2.91)**
	Stable Pure Victim	32 (12.1)	**3.62 (2.15 – 6.11)**	24 (9.3)	**2.21 (1.27 – 3.84)**	32 (12.4)	**2.03 (1.26 – 3.25)**	69 (25.1)	**2.64 (1.86 – 3.75)**
	Unstable Pure Victim vs.	68 (8.9)	(n = 1026)	75 (10.1)	(n = 999)	90 (12.2)	(n = 999)	173 (21.8)	(n = 1067)
	Stable Pure Victim	32 (12.1)	1.38 (.87 – 2.18)	24 (9.3)	.85 (.52 – 1.41)	32 (12.4)	.99 (.63 – 1.54)	69 (25.1)	1.17 (.84 – 1.65)
III.	**Chronicity Any Victim** [1]		(n = 2328)		(n = 2258)		(n = 2258)		(n = 2421)
	Stable Neutral	35 (3.1)	[reference]	41 (3.8)	[reference]	64 (5.9)	[reference]	120 (10.3)	[reference]
	Unstable Victim	69 (8.9)	**2.74 (1.79 – 4.18)**	76 (10.1)	**2.63 (1.76 – 3.94)**	86 (11.4)	**1.98 (1.39 – 2.80)**	169 (20.8)	**2.18 (1.68 – 2.83)**
	Stable Victim	55 (12.9)	**3.86 (2.41 – 6.18)**	46 (11.2)	**2.64 (1.64 – 4.26)**	53 (12.9)	**2.13 (1.40 – 3.23)**	120 (27.1)	**2.90 (2.13 – 3.94)**
	Unstable Any Victims vs.	69 (8.9)	(n=1205)	76 (10.1)	(n = 1165)	86 (11.4)	(n = 1165)	169 (20.8)	(n = 1255)
	Stable Any Victims [1]	55 (12.9)	1.41 (.95 – 2.09)	46 (11.2)	.99 (.65 – 1.50)	53 (12.9)	1.07 (.72 – 1.58)	120 (27.1)	1.32 (.98 – 1.77)

Analysis controlling for: sex, any axis I diagnosis at age 7, internalizing/externalizing behaviour at 8, 9.5 and 11.6 years, family adversity, preschool maladaptive parenting, and domestic violence. Boldface indicates that the 95% CI does not include 1.00. [1] Any victim contains both bully/victim and pure victim status; [2] refers to the number of children who have the associated mental health problem

Online Resource 1: Detailed Listing of Permutations of Changes in Bully/Victimisation Status groups from Primary to Secondary School

Bullying Status	**Frequency (%)**
Stable Neutral	1397 (78.0)
Stable bully/victim	47 (2.6)
Neutral turned into bully/victim	82 (4.6)
Pure victim turned into bully/victim	97 (5.4)
Pure bully turned into bully/victim	7 (.4)
Bully/victim turned into pure victim	71 (4.0)
Bully/victim turned into pure bully	18 (1.0)
Bully/victim turned into neutral	73 (4.1)
Total [1]	1792 (100.0)

[1] Total does not include children who were stable pure victims, neutrals turned into pure victim, pure victims turned into neutrals, stable pure bullies, neutrals turned into pure bullies, pure bullies turned into neutrals)

Online Resource 2: Bullying Subgroups and Mental Health Problems

	Psychosis definite/suspected		Depression		Anxiety		Any Mental Health	
	No (%)	**OR (95% CI)**	**No (%)**	**OR (95% CI)**	**No (%)**	**OR (95% CI)**	**No (%)**	**OR (95% CI)**
Bullying Status		(n=1723)		(n = 1665)		(n = 1665)		(n = 1792)
Stable Neutral	44 (3.3)	[reference]	52 (4.0)	[reference]	78 (5.9)	[reference]	147 (10.5)	[reference]
Stable bully/victim	8 (17.8)	**6.39 (2.81 – 14.52)**	6 (14.0)	**3.93 (1.59 – 9.72)**	4 (9.3)	1.62 (.57 – 4.65)	15 (31.9)	**3.99 (2.11 – 7.53)**
Neutral turned into bully/victim	11 (13.8)	**4.71 (2.33 – 9.52)**	10 (14.5)	**4.10 (1.99 – 8.48)**	9 (13.0)	**2.37 (1.14 – 4.96)**	22 (26.8)	**3.12 (1.86 – 5.23)**
Pure victim turned into bully/victim	12 (12.6)	**4.27 (2.17 – 8.40)**	12 (13.6)	**3.82 (1.96 – 7.46)**	10 (11.4)	**2.03 (1.01 – 4.07)**	28 (28.9)	**3.45 (2.15 – 5.53)**
Pure bully turned into bully/victim	1 (16.7)	5.91 (.68 – 51.65)	0 (0)	**------**	1 (14.3)	2.64 (.31 – 22.16)	2 (28.6)	3.40 (.65 – 17.69)
Bully/victim turned into pure victim	11 (16.2)	**5.70 (2.80 – 11.62)**	6 (9.2)	**2.46 (1.02 – 5.96)**	12 (18.5)	**3.58 (1.84 – 6.97)**	20 (28.2)	**3.34 (1.93 – 5.75)**
Bully/victim turned into pure bully	2 (13.3)	4.55 (1.00 – 20.76)	2 (12.5)	3.46 (.77 – 15.62)	2 (12.5)	2.26 (.50 – 10.11)	3 (16.7)	1.70 (.49 – 5.94)
Bully/victim turned into neutral	7 (10.0)	**3.28 (1.42 – 7.58)**	7 (10.6)	**2.87 (1.25 – 6.60)**	5 (7.6)	1.30 (.51 – 3.32)	13 (17.8)	1.84 (.99 – 3.44)
Adjusted Bullying Status		(n=1431)		(n = 1381)		(n = 1381)		(n = 1488)
Stable Neutral	35 (3.1)	[reference]	41 (3.8)	[reference]	64 (5.9)	[reference]	120 (10.3)	[reference]
Stable bully/victim	6 (18.8)	**5.32 (1.89 – 14.92)**	6 (19.4)	**5 .77 (1.98 – 16.85)**	2 (6.5)	.84 (.18 – 3.85)	12 (36.4)	**4.22 (1.90 – 9.38)**
Neutral turned into bully/victim	8 (12.1)	**4.26 (1.85 – 9.79)**	8 (14.3)	**5.06 (2.17 – 11.79)**	7 (12.5)	**2.46 (1.05 – 5.77)**	17 (25.4)	**3.30 (1.81 – 6.02)**
Pure victim turned into bully/victim	8 (10.8)	**3.68 (1.55 – 8.71)**	10 (14.5)	**4.48 (2.00 – 10.02)**	9 (13.0)	2.20 (.99 – 4.86)	22 (28.9)	**3.39 (1.91 – 6.00)**
Pure bully turned into bully/victim	1 (16.7)	**9.96 (1.04 – 95.35)**	0 (0)	**------**	1 (14.3)	3.87 (.42 – 35.32)	2 (28.6)	4.46 (.80 – 24.79)
Bully/victim turned into pure victim	9 (16.4)	**5.19 (2.16 – 12.48)**	6 (11.3)	**2.85 (1.05 – 7.79)**	10 (18.9)	**3.06 (1.33 – 7.02)**	17 (29.3)	**3.14 (1.63 – 6.06)**
Bully/victim turned into pure bully	2 (15.4)	**4.93 (.96 – 25.45)**	2 (14.3)	4.82 (.91 – 25.49)	2 (14.3)	2.81 (.57 – 13.90)	3 (18.8)	1.97 (.52 – 7.38)
Bully/victim turned into neutral	7 (11.3)	**3.39 (1.36 – 8.42)**	7 (12.1)	**3.70 (1.49 – 9.21)**	5 (8.6)	1.34 (.49 – 3.66)	13 (20.0)	**2.02 (1.03 – 3.98)**

Adjusted analysis controlling for: sex, any axis I diagnosis at age 7, internalizing/externalizing behaviour at 8, 9.5 and 11.6 years, family adversity, preschool maladaptive parenting, and preschool domestic violence