Involvement in Bullying and Suicide-Related Behavior at 11 Years: A Prospective Birth Cohort Study

Catherine Winsper, B.Sc., Tanya Lereya, M.Sc., Mary Zanarini, D.Ed., Dieter Wolke, Ph.D.

Objective: To study the prospective link between involvement in bullying (bully, victim, bully/victim), and subsequent suicide ideation and suicidal/self-injurious behavior, in preadolescent children in the United Kingdom. **Method:** A total of 6,043 children in the Avon Longitudinal Study of Parents and Children (ALSPAC) cohort were assessed to ascertain involvement in bullying between 4 and 10 years and suicide related behavior at 11.7 years. **Results:** Peer victimization (victim, bully/victim) was significantly associated with suicide ideation and suicidal/self-injurious behavior after adjusting for confounders. Bully/victims were at heightened risk for suicide ideation (odds ratio [OR]; 95% confidence interval [CI]): child report at 8 years (OR = 2.84; CI = 1.81–4.45); child report at 10 years (OR = 3.20; CI = 2.07–4.95); mother report (OR = 2.71; CI = 1.81–4.05); teacher report (OR = 2.79; CI = 1.62–4.81), as were chronic victims: child report (OR = 3.26; CI = 2.24–4.75); mother report (OR = 2.49; CI = 1.64–3.79); teacher report (OR = 5.99; CI = 2.79–12.88). Similarly, bully/victims were at heightened risk for suicidal/self-injurious behavior: child report at 8 years (OR = 2.67; CI = 1.66–4.29); child report at 10 years (OR = 3.34; CI = 2.17–5.15); mother report (OR = 2.09; CI = CI = 1.36–3.20); teacher report (OR = 2.44, CI = 1.39–4.30); as were chronic victims: child report (OR = 4.10; CI = 2.76–6.08); mother report (OR = 1.91; 1.22–2.99); teacher report (OR = 3.26; CI = 1.38–7.68). Pure bullies had increased risk of suicide ideation according to child report at age 8 years (OR = 3.60; CI = 1.46–8.84), suicidal/self-injurious behavior according to child report at age 8 years (OR = 3.02; CI = 1.14–8.02), and teacher report (OR = 1.84; CI = 1.09–3.10). **Conclusions:** Children involved in bullying, in any role, and especially bully/victims and chronic victims, are at increased risk for suicide ideation and suicidal/self-injurious behavior in preadolescence. J. Am. Acad. Child Adolesc. Psychiatry, 2012;51(3):271–282. **Key Words:** suicide ideation, suicidal/self-injurious behavior, bully/victim, victim, ALSPAC

Suicide is a significant global health problem among youth, being one of the leading causes of death in many countries.[1] Suicidal behavior occurs along a continuum, from suicide ideation (thinking or communicating about committing suicide) to suicide behavior/attempt, and ultimately, in some cases, successful completion of suicide.[1] Bullying was first seriously considered a cause of suicide in 1982 when three separate suicides in Norway occurred in short succession, with all three victims leaving suicide notes indicating that they had been "whipping boys."[2,3]

Bullying is characterized by aggressive behavior, engaged in repeatedly, by an individual or group of peers with more power than the victim. The aggressive behavior may be verbal, physical, or psychological.[4] Individuals may be involved by way of being a victim, a bully, or a bully/victim (i.e., both a bully and a victim).[5]

Although bully/victims appear to be especially at risk for a range of negative mental health outcomes,[6-8] findings regarding links with suicidal behavior are mixed.[9-11] Most existing studies pertaining to suicide ideation[9, 12-14] and behavior (suicidal/self-injurious behavior)[9,15,16]

Supplemental material cited in this article is available online.

focused on adolescent populations (aged 13-18 years), and were cross-sectional, precluding causal interpretation.

Population-based, prospective studies are infrequent, with few pertaining to suicide ideation from early to late adolescence[17-19] and suicide behavior from early adolescence to early adulthood.[17,19,20] Furthermore, these studies tend not to control for all suicide related risk factors simultaneously, including exposure to family conflict, harsh parenting, abuse,[21] and concomitant mental health problems such as depression,[22] thus potentially confounding observed associations.[23]

The link between bullying and suicide ideation or behavior in preadolescent children has received even less research attention,[11] because of the lower prevalence of suicidal behavior in this age group[1] and ethical concerns pertaining to asking younger individuals about these experiences.[24] The one prospective preadolescent study published reported a complex association between being victimized and suicide ideation, which was moderated by parental internalizing disorders and feelings of rejection at home. This study[11] did not include pure bullies, and those defined as bully/victims were not found to be at increased risk for suicide ideation.[11]

Suicide ideation has been repeatedly observed in child populations,[11,25,26] and crucially, there is consistent evidence linking preadolescent suicidal ideation with later suicide attempts in adolescence.[27,28] With adolescence comes an increased risk of psychopathology, in addition to more freedom and cognitive resources,[1] all of which may heighten the risk of acting upon suicide ideation. Therefore, clarifying the extent of suicide ideation and behaviors within child populations, as well as the strength of associations with peer victimization, is important to assess the optimal period for prevention and intervention strategies.

The aim of this study was to investigate the prospective relationship between involvement in bullying (bully, victim, and bully/victim status) and suicide behaviors/ideations in a preadolescent population. Further, the extent to which these associations were independent of other risk factors for suicide was tested. Both psychopathological (internalizing and externalizing problems[17,26]) and psychosocial (abuse, domestic violence,[25] and harsh parenting[29]) risk factors were incorporated into the analyses.

METHOD

Sample

The Avon Longitudinal Study of Parents and Children (ALSPAC) is a birth cohort study, set in the United Kingdom, examining the determinants of development, health, and disease during childhood and beyond. The study has been described in detail elsewhere.[30] In summary, 14,541 women were enrolled, provided that they were resident in Avon while pregnant and had an expected delivery date between April 1, 1991 and December 31, 1992. As shown in Figure 1, a total of 13,971 children who were alive at 12 months formed the original cohort. From the first trimester of pregnancy parents completed postal questionnaires about themselves and the study child's health and development. Children were invited to attend annual assessment clinics, including face-to-face interviews and psychological and physical tests from age 7 years onward.

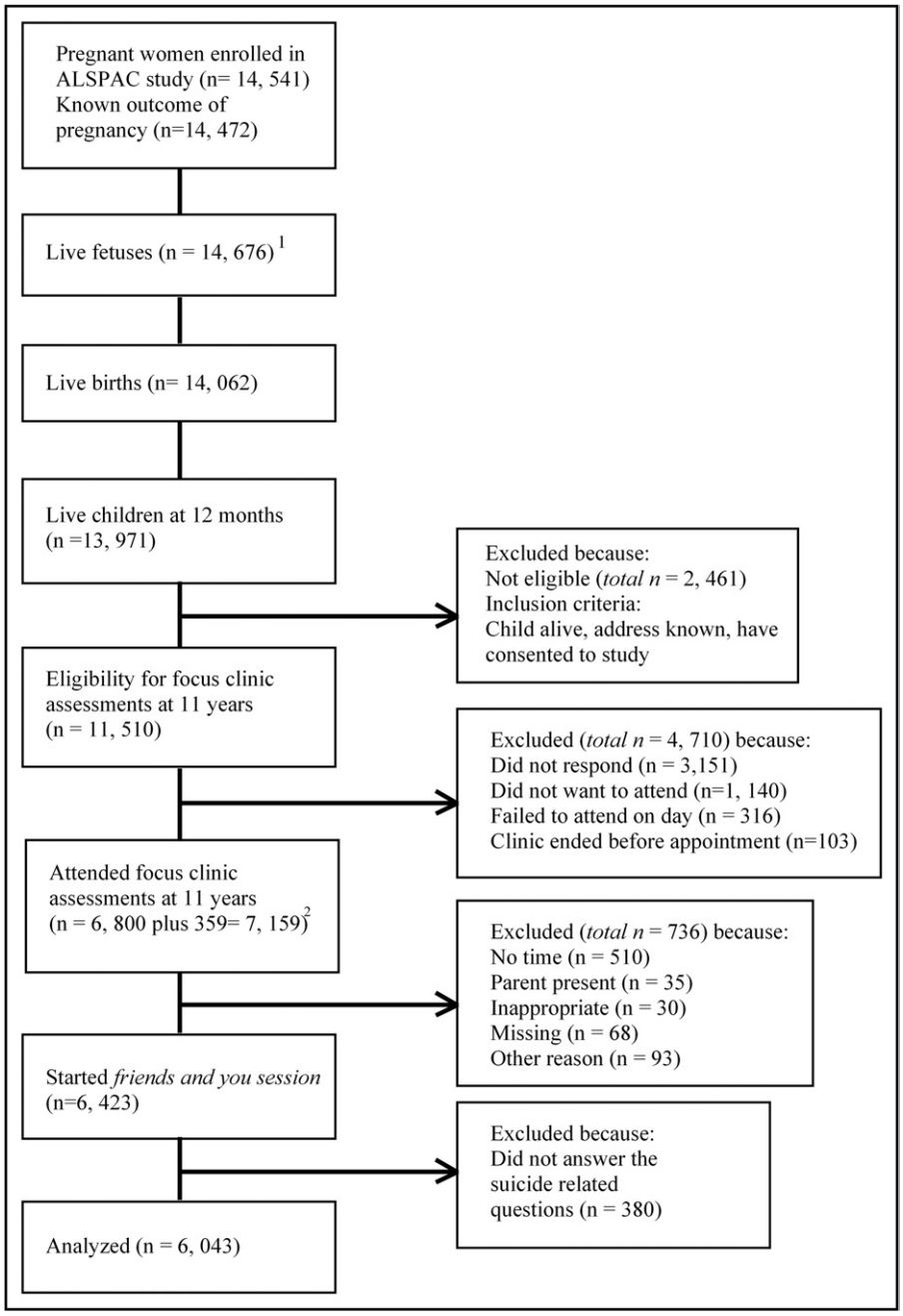
There were 11,510 children who were living in the study area and eligible for invitation to the 11-year annual assessment clinic. Of the children, 6,423 attended and started the interview session, including the suicide-related questions (Figure 1). Children were made aware before the suicide interview that if any serious concerns for their own or other people's health emerged, they would be discussed by the research team and possibly with the parents/legal guardian. A total of 380 children did not answer the suicide related questions (Figure 1). This study is therefore based on 6,043 preadolescents (age range, 10.4-13.6 years; mean age, 11.7 years) who answered questions about any suicidal thoughts or behaviors that they had experienced in the past 2 years.

To assess whether dropout had been random or selective, those who answered the questions were compared with those lost to follow-up (Table 1). The frequencies of socio-demographic, family, and parenting factors, as well as abuse, psychiatric diagnoses, negative emotionality, and peer victimization for participants with and without suicide data are shown in Table 1. Those lost to follow-up were more often boys, had higher internalizing and externalizing scores, were of ethnic minority, had low birth weight, were born to single mothers, had lower educational level, lived in rental properties, and had parents engaged in manual labor jobs. Those exposed to one or more family adversities were less likely to have suicide data, as were those exposed to domestic violence. Those exposed to physical or sexual abuse were more likely to have attended the interview. Generally, participants who dropped out were exposed to more deprivation than the remaining participants.

Measures

Two suicide outcomes were considered.[17,31] Suicide ideation was assessed using the question, "Have you thought about killing yourself?" Suicidal/self-injurious

FIGURE 1 Flow of participants from pregnancy to 11-year assessment in the Avon Longitudinal Study of Parents and Children (ALSPAC) cohort study. Note: (a) Multiple births (195 twins, three triplets, one quadruplet). (b) An additional 359 children were invited who were previously missed pregnancies, born and residing in the Avon area.



behavior was assessed using two questions: "Have you hurt yourself on purpose?" and "Have you actually tried to kill yourself?" Suicidal/self-injurious behavior was considered present if the child responded yes to one or both of the questions.

The interviewer then sensitively explored to clarify that suicide ideation/behavior was not part of a game, an accident, or experimentation. If present, exact circumstances and frequency in the last 2 years were explored. Furthermore, it was ascertained whether an adult was aware of the suicide-related behavior and whether there was present risk.

Bullying variables were constructed from child, mother, and teacher reports. Child reports were

TABLE 1 Dropout Analyses With Regard to Availability of Suicide Behavior Interview

	Suicide Questions Interview Status		Associations
	Interview Not Available	Interview Available	Available vs. Not Available OR (95% CI)
Gender			
Male	4,332 (59.6)	2,934 (40.4)	**Reference**
Female	3,672 (54.2)	3,109 (45.8)	**1.25 (1.17–1.34)**
Ethnicity			
White	5,973 (93.8)	5,535 (96.3)	**Reference**
Black	397 (6.2)	214 (3.7)	**0.58 (0.49–0.69)**
Birth weight			
>2,499 g	7,376 (93.4)	5,701 (95.4)	**Reference**
<2,500 g	518 (6.6)	272 (4.6)	**0.68 (0.58–0.79)**
Marital status			
Single	2,206 (30.5)	1,095 (18.5)	**Reference**
Married	5,037 (69.5)	4,815 (81.5)	**1.93 (1.77–2.09)**
Home ownership			
Mortgaged	4,704 (65)	4,898 (83.7)	**Reference**
Rent	2,535 (35)	955 (16.3)	**0.36 (0.33–0.39)**
Maternal educational level			
Below O level	2,478 (37.4)	1,260 (21.6)	**Reference**
O Level or above	4,148 (62.6)	4,571 (78.4)	**2.17 (2.00–2.35)**
Social class			
Non-manual	2,733 (46)	3,148 (56.5)	**Reference**
Manual	3,212 (54)	2,428 (43.5)	**0.66 (0.61–0.71)**
FAI			
None	2,572 (35.4)	2,784 (46.8)	**Reference**
1 or more adversities	4,702 (64.6)	3,171 (53.2)	**0.62 (0.58–0.67)**
Peer victimization (child report)[a]			
No	1,189 (54.5)	3,114 (53.8)	**Reference**
Yes	991 (45.5)	2,671 (46.2)	1.03 (0.93–1.14)
Abuse (sexual or physical)			
No	5,441 (88.6)	5,096 (85.9)	**Reference**
Yes	697 (11.4)	835 (14.1)	**1.28 (1.15–1.42)**
Domestic violence			
No	4,773 (76.1)	4,646 (78.9)	**Reference**
Yes	1,497 (23.9)	1,240 (21.1)	**0.85 (0.78–0.93)**
Maladaptive preschool parenting			
No	2,609 (52.4)	2,889 (51.5)	**Reference**
1	1,950 (39.1)	2,189 (39)	1.01 (0.94–1.10)
2	424 (8.5)	528 (9.4)	1.13 (0.98–1.29)
SDQ Emotionality Mean (SD)	1.55 (1.35)	1.50 (1.29)	0.97 (0.94–1.01)
SDQ Conduct Problems Mean (SD)	1.50 (1.02)	1.40 (0.99)	**0.91 (0.87–0.96)**

Note: Boldface type indicates significant associations, i.e., the 95% confidence intervals (CI) do not cross 1. FAI = Family Adversity Index; OR = odds ratio; SDQ = Strengths and Difficulties Questionnaire.

[a]*Overt or relational victimization at 8 or 10 years.*

collected (at 8 and 10 years), using a modified version of the Bullying and Friendship Interview Schedule.[32] They were asked five questions (for giving and receiving) pertaining to experience of overt bullying, specifically, whether they had experienced any of the following: had personal belongings taken; had been threatened or blackmailed; had been hit or beaten up; had been tricked in a nasty way; had been called bad/nasty names. In addition, they were asked four questions (for giving and receiving) pertaining to relational bullying: exclusion to upset the child; pressure to do things s/he didn't want to do; lies or nasty things said about others; games spoiled. Overt victimization was

coded as present if the child confirmed that at least one of the five behaviors occurred repeatedly (four or more times in the past 6 months) or very frequently (at least once per week in the past 6 months). Similarly relational victimization was coded as present if the child confirmed that at least one of the four behaviors occurred repeatedly or very frequently.

A bullying status variable was constructed by summing any victimization (overt and/or relational) and any bullying (overt and/or relational). The following categories were derived: not involved in bullying; bully/victim (any reported victimization and any reported bullying) status; pure victim (relational and/or overt victimization) status; pure bully (relational and/or overt bullying) status. Finally, a chronic victimization variable was constructed, by considering child reported victimization at 8 and 10 years. The following categories were derived: no victimization; unstable (overt or relational victimization at 8 or 10 years); and stable (overt or relational victimization at both 8 and 10 years).

Mother-reported victim status was constructed from a single question, "child is picked on or bullied by other children," asked repeatedly at 4, 7, and 9 years. Bully status was constructed from the question, "In the past year has the child bullied or threatened someone?" asked at 4, 7, and 9 years. Victim and bully status were coded as present if the mother replied "applies somewhat" or "certainly applies" at any time point. The following mother-reported bullying variable was constructed: not involved in bullying; bully/victim status; pure victim status; or pure bully status. Teachers responded to the same items when the children were 7 and 10 years of age; and the same bullying variable (as described for mother report above) was constructed. In addition, mother (no victimization; unstable = one time point; stable = two or three time points) and teacher (no victimization; unstable = one time point; stable = two time points) chronicity variables were constructed.

The overall agreement rates between the different informants were as follows: mothers and teachers 66% ($\kappa = 0.17$; $p < .001$); mothers and children, 59.9% ($\kappa = 0.18$; $p < .001$); and teachers and children, 57.5% ($\kappa = 0.10$; $p < .001$),[33] which are consistent with previously reported data.[34]

Sociodemographic and birth variables included the following: birth weight obtained from birth records; ethnic background (ethnic minority versus white), mothers' marital status (married versus single), home ownership (mortgaged versus rented), parental social class (using the 1991 OPCS classification[35] and dichotomized into manual and nonmanual), and maternal education (O level or more versus less than O level, where O levels were the standard school-leaving qualifications, taken around age 16 years, until recently in the United Kingdom), all obtained from mother reported questionnaires during the antenatal period. Multiple family risk factors during pregnancy were assessed with the Family Adversity Index (FAI).[36] The FAI consists of 18 items (e.g., financial difficulties, maternal affective disorder) taken from questionnaires administered throughout pregnancy (8 weeks' gestation, 12 weeks' gestation, 18 weeks' gestation, and 32 weeks' gestation). If adversity was present in an item, this was rated as 1. The 18 items were then summed and dichotomized into no adversity versus adversity (one or more items).

Potential confounders included the following. First, child abuse was constructed from two items answered by the mother ("he/she was sexually abused and he/she was physically hurt by someone" at 1.5, 2.5, 3.5, 4.8, 6.8, and 8.6 years of age, and were coded as present if sexual and/or physical abuse were reported at any time point. Second, maladaptive parenting (from 0 to 3.5 years) was constructed from two items: maternal hitting (daily or every week at 2 and/or 3.5 years) and maternal hostility (four items at 1.8 or 4 years. e.g., "mum feels whining makes her want to hit child"), which were found to load on a distinct factor of parenting.[37] The maladaptive parenting composite was constructed as none (no exposure), mild (exposure to hitting or hostility), and severe (exposure to hitting and hostility). Third, domestic violence was considered present if there was emotional (partner emotionally cruel at 0.7, 1.8, 2.8, 4 years) and/or physical domestic violence (partner physically cruel at 0.7, 1.8, 2.8, 4 years or partner broken or thrown things at 1.8, 2.8 years)[36] reported at any time point by the mother. Fourth, externalizing and internalizing symptoms were assessed using the Strengths and Difficulties Questionnaire (SDQ)[38,39] at 4, 6.8, 8, and 9.6 years. Externalizing symptoms were assessed using the conduct problems subscale, comprising the following five items: child has temper tantrums; child is obedient (reverse scored); child often fights with or bullies others; child often cheats/lies; child steals from home. The "child bullies" item was removed to prevent confounding with the mother reported bullying variable. These four items were summed and averaged across the four time points for all children with measures from at least three of the four time points. Internalizing symptoms were assessed using the negative emotionality subscale, comprising the following five items: child complains of aches; child has many worries; child is often unhappy; child is nervous in new situations; child has many fears. Similarly, these items were summed and averaged for all children across measurement points. The association of sociodemographic variables with potential confounders is shown in Tables S1 and S2, available online.

Ethical approval for the study was obtained from the ALSPAC Law and Ethics committee and the local research ethics committees.

Statistical Analyses

All analyses were carried out using SPSS version 18. Logistic regression models were used to estimate odds

TABLE 2 Suicide Ideation, Suicidal/Self-Injurious Behavior, and Peer Bullying Role by Gender

	Total No. (%)	Males No. (%)	Females No. (%)	Males vs. Females OR (95% CI)
Suicide ideation[a]				
No	5,754 (95.2)	2,782 (94.8)	2,972 (95.6)	**Reference**
Yes	289 (4.8)	152 (5.2)	137 (4.4)	1.19 (0.94–1.50)
Suicidal/self-injurious behavior[b]				
No	5,773 (95.4)	2,752 (93.6)	3,021 (97.1)	**Reference**
Yes	278 (4.6)	188 (6.4)	90 (2.9)	**2.29 (1.77–2.96)**
Child report:				
Bully victim status at 8 y				
None	3,016 (59.7)	1,381 (56.7)	1,635 (62.4)	**Reference**
Bully/victim	344 (6.8)	227 (9.3)	117 (4.5)	**2.30 (1.82–2.90)**
Victim	1,639 (32.4)	791 (32.5)	848 (32.4)	1.10 (0.98–1.25)
Bully	55 (1.1)	36 (1.5)	19 (0.7)	**2.24 (1.28–3.93)**
Bully victim status at 10 y				
None	4,168 (75.0)	1,919 (71.5)	2,249 (78.3)	**Reference**
Bully/victim	302 (5.4)	221 (8.2)	81 (2.8)	**3.20 (2.45–4.14)**
Victim	1,035 (18.6)	505 (18.8)	530 (18.4)	1.12 (0.97–1.28)
Bully	52 (0.9)	39 (1.5)	13 (0.5)	**3.43 (1.82–6.46)**
Overt victim[c]				
No	3,438 (59.4)	1,503 (53.7)	1,935 (64.8)	**Reference**
Yes	2,346 (40.6)	1,297 (46.3)	1,049 (35.2)	**1.59 (1.43–1.77)**
Relational victim[c]				
No	4,636 (80.4)	2,296 (82.1)	2,340 (78.8)	**Reference**
Yes	1,131 (19.6)	500 (17.9)	631 (21.2)	**0.81 (0.71–0.92)**
Mother report:				
Bully victim status				
None	2,785 (58.3)	1,491 (53.5)	1,856 (62.8)	**Reference**
Bully/victim	591 (10.3)	353 (12.7)	238 (8.1)	**1.85 (1.55–2.21)**
Victim	1,180 (20.6)	594 (21.3)	586 (19.8)	**1.26 (1.11–1.44)**
Bully	623 (10.9)	347 (12.5)	276 (9.3)	**1.57 (1.32–1.86)**
Teacher report:				
Bully victim status				
None	3,487 (78.6)	1,527 (71.1)	1,960 (85.6)	**Reference**
Bully/victim	207 (4.7)	150 (7.0)	57 (2.5)	**3.32 (2.43–4.53)**
Victim	419 (9.4)	247 (11.5)	172 (7.5)	**1.84 (1.50–2.26)**
Bully	326 (7.3)	225 (10.5)	101 (4.4)	**2.89 (2.26–3.69)**

Note: Boldface type indicates significant associations, i.e., 95% confidence intervals (CI) do not cross 1. OR = odds ratio.
[a]*Suicide ideation: thought about killing self.*
[b]*Suicidal self/injurious behavior: hurt self on purpose and/or actually tried to kill self.*
[c]*At 8 and or 10 years.*

ratios (OR) with 95% confidence intervals (CI). Gender differences for the suicide ideation and suicidal/self-injurious behaviors and peer victimization variables were computed (Table 2). Crude associations between peer victimization measures and suicide ideation and suicidal/self-injurious behaviors were computed (see Table S3, available online). Analyses were then carried out controlling for potential confounders (Table 3 and Table 4). Model A is based on the full data set controlling for age and gender. Model B incorporated (with age and gender) environmental confounders including abuse, maladaptive parenting and exposure to domestic violence. Model C included the preceding controls and, in addition, internalizing and externalizing problems.

RESULTS

Frequency and Gender Differences of Suicide Ideation and Suicidal/Self-Injurious Behavior and Peer Victimization

Of the children, 4.8% reported engaging in suicidal ideation, and 4.6%, in suicidal or self-injurious

TABLE 3 Associations Between Bullying Behavior and Suicide Ideation Controlling for Potentially Confounding Factors

Peer Victimization Status	Model A[a] OR (95% CI)	Model B[b] OR (95% CI)	Model C[c] OR (95% CI)
Child report at 8 years	(n = 5,047)[d]	(n = 4,775)[d]	(n = 4,404)[d]
None	**Reference**	**Reference**	**Reference**
Bully/victim	**3.50 (2.34–5.25)**	**3.41 (2.24–5.18)**	**2.84 (1.81–4.45)**
Victim only	**1.70 (1.26–2.29)**	**1.70 (1.25–2.31)**	**1.57 (1.15–2.16)**
Bully only	**3.74 (1.56–8.97)**	**3.74 (1.55–9.07)**	**3.60 (1.46–8.84)**
Child report at 10 years	(n = 5,550)	(n = 5,207)	(n = 4,719)
None	**Reference**	**Reference**	**Reference**
Bully/victim	**4.23 (2.88–6.20)**	**3.84 (2.57–5.74)**	**3.20 (2.07–4.95)**
Victim only	**2.40 (1.80–3.19)**	**2.20 (1.64–2.96)**	**1.95 (1.42–2.66)**
Bully only	1.16 (0.28–4.83)	1.13 (0.27–4.75)	0.56 (0.08–4.13)
Overt victim	(n = 5,778)	(n = 5,403)	(n = 4,879)
No	**Reference**	**Reference**	**Reference**
Yes	**2.30 (1.79–2.96)**	**2.19 (1.69–2.84)**	**1.88 (1.43–2.47)**
Relational victim	(n = 5,760)	(n = 5,389)	(n = 4,868)
No	**Reference**	**Reference**	**Reference**
Yes	**1.76 (1.34–2.32)**	**1.74 (1.31–2.30)**	**1.60 (1.18–2.16)**
Chronicity (child report)	(n = 4,829)	(n = 4,589)	(n = 4,251)
None	**Reference**	**Reference**	**Reference**
Unstable	**1.66 (1.19–2.32)**	**1.59 (1.13–2.23)**	**1.47 (1.03–2.09)**
Stable	**4.03 (2.84–5.72)**	**3.68 (2.57–5.28)**	**3.26 (2.24–4.75)**
Chronicity (mother report)	(n = 4,273)	(n = 4,252)	(n = 4,249)
None	**Reference**	**Reference**	**Reference**
Unstable	**2.62 (1.88–3.65)**	**2.43 (1.74–3.40)**	**2.25 (1.60–3.17)**
Stable	**3.64 (2.51–5.26)**	**3.03 (2.06–4.46)**	**2.49 (1.64–3.79)**
Chronicity (teacher report)	(n = 4,435)	(n = 4,118)	(n = 3,691)
None	**Reference**	**Reference**	**Reference**
Unstable	**2.01 (1.41–2.87)**	**1.81 (1.25–2.64)**	**1.93 (1.30–2.86)**
Stable	**5.66 (2.93–10.93)**	**5.18 (2.57–10.43)**	**5.99 (2.79–12.88)**
Mother report	(n = 5,741)	(n = 5,502)	(n = 4,990)
None	**Reference**	**Reference**	**Reference**
Bully/victim	**4.01 (2.91–5.55)**	**3.22 (2.27–4.58)**	**2.71 (1.81–4.05)**
Victim only	**2.20 (1.62–2.97)**	**2.03 (1.48–2.77)**	**1.99 (1.42–2.80)**
Bully only	1.42 (0.92–2.19)	1.34 (0.87–2.09)	1.25 (0.77–2.02)
Teacher report	(n = 4,434)	(n = 4,117)	(n = 3,690)
None	**Reference**	**Reference**	**Reference**
Bully/victim	**3.45 (2.18–5.48)**	**2.85 (1.74–4.68)**	**2.79 (1.62–4.81)**
Victim only	**2.00 (1.32–3.02)**	**1.89 (1.23–2.92)**	**1.99 (1.27–3.12)**
Bully only	1.58 (0.96–2.61)	1.50 (0.89–2.52)	1.08 (0.57–2.00)

Note: Boldface type indicates significant associations, i.e., 95% confidence intervals (CI) do not cross 1. OR = odds ratio.

[a]*Controlling for age and gender.*

[b]*Controlling for age, gender, and additionally abuse, domestic violence, and maladaptive parenting.*

[c]*Controlling for negative emotionality and conduct disorder in addition to age, gender, abuse, domestic violence, and maladaptive parenting.*

[d]*Number of participants in analysis.*

behavior. Although there were no gender differences regarding suicide ideation, more boys (6.4%) than girls (2.9%) reported suicidal or self-injurious behavior. More males than females were classified as bully/victims according to child (at both 8 and 10 years), mother, and teacher report. Males were more often victimized than females according to mother and teacher report, and were more often classified as bullies according to all three informants. Males were more likely to be overtly bullied, whereas females were more likely to be relationally bullied.

TABLE 4 Associations Between Bullying and Suicidal/Self-Injurious Behavior Controlling for Potentially Confounding Factors

Peer Victimization Status	Model A[a] OR (95% CI)	Model B[b] OR (95% CI)	Model C[c] OR (95% CI)
Child report at 8 years	(n = 5,053)[d]	(n = 4,780)[d]	(n = 4,408)[d]
None	**Reference**	**Reference**	**Reference**
Bully/victim	**2.92 (1.88–4.53)**	**2.60 (1.64–4.13)**	**2.67 (1.66–4.29)**
Victim only	**2.36 (1.75–3.18)**	**2.28 (1.67–3.09)**	**2.05 (1.48–2.83)**
Bully only	**3.90 (1.61–9.42)**	**2.93 (1.12–7.69)**	**3.02 (1.14–8.02)**
Child report at 10 years	(n = 5,558)	(n = 5,214)	(n = 4,724)
None	**Reference**	**Reference**	**Reference**
Bully/victim	**3.87 (2.63–5.69)**	**4.07 (2.74–6.03)**	**3.34 (2.17–5.15)**
Victim only	**2.53 (1.89–3.38)**	**2.45 (1.81–3.32)**	**2.25 (1.63–3.09)**
Bully only	1.57 (0.48–5.13)	1.61 (0.49–5.29)	1.12 (0.26–4.74)
Overt victim	(n = 5,786)	(n = 5,410)	(n = 4,884)
No	**Reference**	**Reference**	**Reference**
Yes	**2.90 (2.22–3.79)**	**2.87 (2.17–3.79)**	**2.56 (1.91–3.44)**
Relational victim	(n = 5,768)	(n = 5,396)	(n = 4,873)
No	**Reference**	**Reference**	**Reference**
Yes	**1.92 (1.46–2.53)**	**1.88 (1.41–2.50)**	**1.77 (1.31–2.41)**
Chronicity (child report)	(n = 4,835)	(n = 4,594)	(n = 4,255)
None	**Reference**	**Reference**	**Reference**
Unstable	**2.05 (1.45–2.89)**	**1.96 (1.38–2.81)**	**1.91 (1.32–2.76)**
Stable	**4.78 (3.33–6.86)**	**4.67 (3.21–6.78)**	**4.10 (2.76–6.08)**
Chronicity (mother report)	(n = 4,278)	(n = 4,257)	(n = 4,254)
None	**Reference**	**Reference**	**Reference**
Unstable	**2.04 (1.45–2.87)**	**1.97 (1.39–2.78)**	**1.82 (1.28–2.60)**
Stable	**2.53 (1.70–3.76)**	**2.28 (1.51–3.44)**	**1.91 (1.22–2.99)**
Chronicity (teacher report)	(n = 4,441)	(n = 4,123)	(n = 3,695)
None	**Reference**	**Reference**	**Reference**
Unstable	**1.71 (1.19–2.47)**	**1.61 (1.10–2.37)**	**1.65 (1.09–2.49)**
Stable	**3.88 (1.92–7.85)**	**3.92 (1.91–8.03)**	**3.26 (1.38–7.68)**
Mother report	(n = 5,747)	(n = 5,508)	(n = 4,995)
None	**Reference**	**Reference**	**Reference**
Bully/victim	**2.80 (1.99–3.93)**	**2.59 (1.79–3.74)**	**2.09 (1.36–3.20)**
Victim only	**1.76 (1.29–2.41)**	**1.65 (1.20–2.29)**	**1.74 (1.22–2.46)**
Bully only	**1.51 (1.00–2.26)**	1.41 (0.92–2.16)	1.32 (0.83–2.10)
Teacher report	(n = 4,440)	(n = 4,122)	(n = 3,694)
None	**Reference**	**Reference**	**Reference**
Bully/victim	**3.08 (1.92–4.93)**	**2.85(1.74–4.69)**	**2.44 (1.39–4.30)**
Victim only	**1.70 (1.09–2.63)**	**1.67 (1.05–2.64)**	**1.74 (1.07–2.84)**
Bully only	**2.16 (1.39–3.35)**	**2.14 (1.35–3.40)**	**1.84 (1.09–3.10)**

Note: Boldface type indicates significant associations, i.e., the 95% confidence intervals (CI) do not cross 1. OR = odds ratio.
[a]*Controlling for age and gender.*
[b]*Controlling for age, gender and also abuse, domestic violence, and maladaptive parenting.*
[c]*Controlling for negative emotionality and conduct disorder in addition to age, gender, abuse, domestic violence and maladaptive parenting.*
[d]*Number of participants in analysis.*

Crude Associations Between Bullying Behavior and Suicide Ideation and Suicidal/Self-Injurious Behavior

Bully/victim and victim status were consistently predictive of suicide ideation and suicidal/self-injurious behavior, according to all respondents (see Table S3, available online). Pure bully status, according to child report at 8 years and teacher report, was also predictive of suicide ideation; and suicidal self-injurious behavior according to child (8 years), mother, and teacher report. According to child report, overt and relational victimization were predictive of suicide ideation and suicidal/self-injurious behavior. Chronic

victimization was strongly predictive of suicide ideation and suicidal/self-injurious behavior, according to child, mother, and teacher report.

Associations Between Bullying Behavior and Suicidal Ideation Controlling for Confounding Factors

Associations between bullying behavior and suicide ideation and suicidal/self-injurious behavior were computed accounting for potential confounders, including: age and gender (model A); also abuse by an adult, exposure to domestic violence, and maladaptive parenting (model B), and also child internalizing and externalizing disorders (model C) (Tables 3 and 4).

Pure victim status remained predictive of suicide ideation according to child, mother, and teacher report (Table 3). Pure bullies were at increased risk for suicide ideation according to child report at 8 years (OR = 3.60, 95% CI = 1.46-8.84). Both relational and overt victimization remained predictive of suicide ideation. Bully/victim status remained predictive of suicidal ideation for child (8 and 10 years), mother, and teacher report, after adjusting for confounders.

Chronicity of victimization remained strongly predictive of suicide ideation, according to child, mother, and teacher report. According to child report, those exposed to overt or relational bullying at 8 or 10 years were 1.47 (CI = 1.03-2.09) times more likely to report suicide ideation, whereas those exposed to bullying at both time points were 3.26 (CI = 2.24-4.75) times more likely to report suicide ideation. According to mother report, those exposed to bullying at one or at two or three time points were more likely to report suicide ideation. According to teacher report, those exposed to bullying at one time point were 1.93 (CI = 1.30-2.86), and those exposed to bullying at two time points were 5.99 (CI = 2.79-12.88) times more likely to report suicide ideation.

Associations Between Bullying Behavior and Suicidal/Self-Injurious Behavior Controlling for Confounding Factors

Pure victim status remained predictive of suicidal/self-injurious behavior according to child report at 8 and 10 years, mother, and teacher report (Table 4). Pure bullies, according to child report at 8 years and teacher report, were at increased risk for suicidal/self-injurious behavior. Both relational victimization (OR = 1.77; CI = 1.31-2.41) and overt victimization (OR = 2.56; CI = 1.91-3.44) remained predictive of suicidal/self-injurious behavior. Bully/victim status remained predictive of suicidal/self-injurious behavior for child (8 and 10 years), mother, and teacher report, after adjusting for confounders. Chronicity of exposure remained strongly predictive of suicidal/self-injurious behavior according to child, mother, and teacher report (Table 4).

DISCUSSION

We found that children identified as victims or bully/victims, across different informants, were more likely to engage in suicide ideation and behavior (suicidal/self-injurious behavior), even after controlling for potential confounders. Both overt and relational victimization were associated with future suicide ideation and suicidal self-injurious behavior, supporting that indirect, more subtle, forms of victimization also lead to considerable psychological harm, which may include suicidal behavior.[40,41] Indirect victimization may lead to feelings of social exclusion, and suicidal behavior may reflect an attempt to escape from the self and world because of internalized feelings of inadequacy and subsequent negative affect.[41]

An association between peer victimization and suicide ideation[9,12-14] and behavior[9,15,16] has been found in several studies; however, most were cross-sectional. Considering the few prospective studies pertaining to adolescents, our results are largely concordant in revealing that victims and bully/victims, especially, are at increased risk for suicide ideation[17] and behavior,[20] compared with non-victims. In contrast, the only prospective study regarding preadolescent children, did not report an association between bully-victimization and subsequent suicide ideation.[11] Therefore, our findings extend the current literature by revealing that victims, and particularly bully/victims, are at increased risk for suicide ideation and behavior during preadolescence.

Previous studies suggest that bully/victims are especially at risk for suicide ideation and behavior because of increased mental health problems.[17,19] The observed increased risk for bully/victims may be attributable to the unique profile of these children. Bully/victims tend to experience heightened emotional arousal compared with other bully subgroups,[7] and are char-

acterized by poor impulse control, breaking rules in games and generally annoying other children.[5, 42] They are the least popular and most rejected children, as rated by peers.[43,44] These features may indicate early personality problems,[45] and suicidal ideation and behavior may represent an attempt at reducing intolerable emotional states[46] or the ultimate approach to overcoming high rejection from peers.

We also found that chronic victims, according to child and teacher report, were at heightened risk for suicide ideation and suicidal/self-injurious behavior during late childhood. Repeated exposure to bullying may have physiological repercussions, exacerbating an already vulnerable stress response,[47] leading to further affective dysregulation and impulsivity. Thus, engaging in suicide ideation[48] or self-injurious/suicidal behaviors[49] may reflect maladaptive coping strategies, in response to increases in dysregulation.

Pure bullies, according to child (8 years) and teacher report, were more likely to engage in suicidal/self-injurious behavior in particular. Previous cross-sectional studies have reported an association between bullying behavior and suicide ideation or behavior.[10,12,13,31] Bullies are often exposed to family adversity and inconsistent parenting,[12] and are at increased risk for psychiatric morbidity in childhood, generally. One prospective study[18] reported that bullying perpetration at age 8 was not associated with suicide ideation 10 years later, after controlling for childhood depression and conduct problems. Our study found that controlling for pre-existing emotional and conduct problems, abuse, domestic violence, and hostile parenting attenuated relationships, but that pure bullies remained at increased risk for suicidal or self-injurious behavior according to child and teacher report.

Currently, there are limited longitudinal studies regarding pure bullies in comparison to bully/victims and victims.[50] Subsequently, further prospective research is required to confirm that pure bullies experience comparable risk to victims or bully/victims for suicidality, after controlling for pre-existing psychiatric problems.

Our study has a number of strengths. We used data from a large prospective cohort. Bullying behavior was assessed using multiple informants, thus providing evidence of converging links to suicide ideation and suicidal/self-injurious behavior, supporting the validity of the observed associations. Furthermore, we controlled for a wide range of known confounders associated with suicide-related behavior. To our knowledge, this is the first study to prospectively assess the predictive relationship between bullying and suicide ideation as well as behavior in preadolescents, revealing that preadolescents exposed to bullying may not only think about, but engage in, suicidal behavior.

There was considerable attrition in this longitudinal study, especially when all confounders were included. Those growing up in adverse social circumstances were more likely to have been lost to follow-up. Furthermore, 380 children did not answer questions about suicide ideation or suicidal/self-injurious behavior. Thus, this study is likely to underestimate the prevalence of suicide ideation and suicidal/self-injurious behavior, during preadolescence, in the community.

Prevalence figures from longitudinal studies should be interpreted with caution; however, analysis revealed that peer victimization was not related to selective dropout. Under these circumstances, estimates of exposure (bullying)–outcome (suicide ideation/behavior) associations are unlikely to be substantially altered by selective dropout processes.[51] This has, indeed, been shown in several empirical studies and theoretical simulations.[51-53] Thus, selective dropout affects mainly statistical power (i.e., because of the reduced sample size and outcome numbers) regarding the exposure–outcome relationship, rather than the nature of the association; however, this possibility cannot be ruled out entirely.[51] Future studies should explore for potential variations in these findings by sociodemographic status.

Data regarding suicide ideation/behavior were obtained by self-report rather than by clinical examination. However, the interviews were carefully conducted by trained psychologists to clarify the relevance of reported thoughts and actions.

In conclusion, our study findings suggest that suicide-related behavior is a serious problem for preadolescent youth: 4.8% of this community population reported suicide ideation, and 4.6% reported suicidal/self-injurious behavior. Furthermore, a significant association between exposure to bullying and suicide ideation and behavior in late childhood was revealed. Health practitioners should be aware of the relationship between bullying and suicide, and should recog-

nize the very real risks that may be evident earlier in development than commonly thought. Intervention strategies should target both overt and relational bullying, as failing to consider more subtle, indirect aggression could ultimately lead to a large number of children at risk being ignored.[54] Furthermore, targeting intervention schemes from primary school onward is paramount,[55] and could help to prevent chronic exposure to bullying, which is especially harmful.

The addition of emotional arousal assessments (physiological in addition to self-report)[7] and consideration of peer rejection and personality factors may be promising for research. Clinicians should routinely ask children about their peer relationships in consultations.[56] &

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Ms. Winsper, Ms. Lereya, and Dr. Wolke are with the University of Warwick. Dr. Zanarini is with McLean Hospital, Harvard Medical School.

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Correspondence to Dieter Wolke, Ph.D., Department of Psychology, University of Warwick, Coventry, CV4 7AL, UK; e-mail: D.Wolke@warwick.ac.uk

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TABLE S1 Association of Sociodemographic Variables With Potential Confounders

Socio-Demographic Factors	Abuse[a] Odds Ratio (95% CI)	Domestic Violence[a] Odds Ratio (95% CI)	Conduct Disorder Score[b] Mean (SD)	Negative Emotionality Score[b] Mean (SD)
Social class (nonmanual vs. manual)	**0.89 (0.78–0.98)**	**1.29 (1.14–1.46)**	**1.32 (0.96) vs. 1.46 (1.0)**	1.50 (1.36) vs. 1.49 (1.27)
Ethnic background (white vs. ethnic minority)	**1.45 (1.15–1.84)**	**1.92 (1.59–2.31)**	**1.42 (1.00) vs. 1.56 (1.10)**	1.51 (1.32) vs. 1.52 (1.25)
Home ownership (own vs. rent)	**1.30 (1.15–1.47)**	**1.94 (1.77–2.14)**	**1.38 (0.97) vs. 1.66 (1.10)**	**1.49 (1.30) vs. 1.65 (1.38)**
Maternal education (lower vs. higher)	**1.40 (1.23–1.59)**	0.91 (0.83–1.00)	**1.60 (1.09) vs. 1.38 (0.97)**	**1.59 (1.38) vs. 1.49 (1.29)**
Family Adversity Index (none vs. adversity)	**1.51 (1.35–1.69)**	**3.26 (2.95–3.60)**	**1.28 (0.92) vs. 1.56 (1.05)**	**1.36 (1.21) vs. 1.66 (1.38)**
Marital status (single vs. married)	**0.83 (0.73–0.94)**	**0.44 (0.40–0.49)**	**1.62 (1.06) vs. 1.39 (0.98)**	**1.58 (1.36) vs. 1.50 (1.30)**

Note: Data in boldface type indicate significant values at $p < .05$.
[a]*Logistic regression, with 95% confidence intervals (CI) in parentheses.*
[b]*t Test.*

TABLE S2 Association of Sociodemographic Variables With Maladaptive Parenting

Socio-Demographic Factors	Parenting Mild[a] Odds Ratio (CI)	Parenting Severe[a] Odds Ratio (CI)
Social class (nonmanual vs. manual)	**1.23 (1.14–1.35)**	1.08 (0.94–1.25)
Ethnic background (white vs. ethnic minority)	0.94 (0.76–1.16)	1.33 (0.97–1.83)
Home ownership (own vs. rent)	**1.19 (1.07–1.31)**	**1.24 (1.05–1.47)**
Maternal education (lower vs. higher)	0.91 (0.83–1.00)	0.94 (0.80–1.10)
Family Adversity Index (0 vs. adversity)	**1.17 (1.08–1.27)**	**1.63 (1.41–1.89)**
Marital status (single vs. married)	**0.87 (0.79–0.97)**	**0.77 (0.65–0.91)**

Note: Data in boldface type indicate significant values at $p < .05$.
[a]*Logistic regressions with 95% confidence interval (CI) in parentheses.*

TABLE S3 Crude Associations Between Bullying Behavior and Suicide Ideation and Suicidal Self-Injurious Behavior

Any Victim by Informant	Total No.	Suicide Ideation Odds Ratio (95% CI)	Suicidal/Self-Injurious Behavior Odds Ratio (95% CI)
Child report at 8 years			
None	3,011	**Reference**	**Reference**
Bully/victim	344	**3.55 (2.38–5.30)**	**3.44 (2.23–5.31)**
Victim only	1,637	**1.70 (1.27–2.29)**	**2.40 (1.78–3.24)**
Bully	55	**3.72 (1.56–8.90)**	**4.43 (1.85–10.64)**
Child report at 10 years			
None	4,162	**Reference**	**Reference**
Bully/victim	301	**4.34 (2.98–6.33)**	**4.68 (3.20–6.84)**
Victim only	1,036	**2.41 (1.81–3.20)**	**2.57 (1.92–3.43)**
Bully	51	1.19 (0.29–4.94)	1.93 (0.59–6.28)
Overt victimization[a]			
None	3,435	**Reference**	
Victimization	2,343	**2.32 (1.81–2.97)**	**3.02 (1.28–7.11)**
Relational victimization[a]			
None	4,631	**Reference**	
Victimisation	1,129	**1.74 (1.33–2.29)**	**1.82 (1.38–2.40)**
Chronicity (child report)			
None	2,454	**Reference**	**Reference**
Unstable[b]	1,714	**1.67 (1.20–2.34)**	**2.14 (1.52–3.01)**
Stable[c]	661	**4.09 (2.88–5.79)**	**5.13 (3.59–7.35)**
Chronicity (mother report)			
None	2,880	**Reference**	**Reference**
Unstable[d]	912	**2.64 (1.90–3.67)**	**2.12 (1.50–2.98)**
Stable[e]	481	**3.69 (2.55–5.34)**	**2.71(1.83–4.02)**
Chronicity (teacher report)			
None	3,808	**Reference**	**Reference**
Unstable[d]	565	**2.08 (1.46–2.96)**	**1.91 (1.33–2.75)**
Stable[e]	62	**6.06 (3.16–11.63)**	**4.83 (2.41–9.70)**
Mother report			
None	3,424	**Reference**	
Bully/victim	404	**4.30 (2.92–5.55)**	**3.08 (2.19–4.31)**
Victim only	1,340	**2.20 (1.62–2.98)**	**1.83 (1.34–2.50)**
Bully	458	1.43 (0.93–2.20)	**1.62 (1.08–2.43)**
Teacher report			
None	3,482	**Reference**	
Bully/victim	208	**3.64 (2.31–5.73)**	**3.69 (2.32–5.86)**
Victim only	419	**2.05 (1.36–3.10)**	**1.87 (1.21–2.90)**
Bully	325	**1.65 (1.01–2.72)**	**2.53 (1.64–3.90)**

Note: Suicide ideation indicates thought about killing self; Suicidal/self-injurious behavior indicates hurt self on purpose or actually tried to kill self. Boldface type indicates significant associations, i.e., the 95% confidence intervals (CI) do not cross 1. OR = odds ratio.

[a] *At 8 or 10 years.*
[b] *At 8 or 10 years.*
[c] *At 8 and 10 years.*
[d] *One time.*
[e] *Two or three times.*