

Bullying as a predictor of offending, violence and later life outcomes

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ABSTRACT

Aim *The main aim of this paper is to investigate to what extent self-reported bullying at age 14 predicts later offending, violence and other life outcomes.*

Method *In the Cambridge Study in Delinquent Development, 411 South London males were followed up from age 8–10 to age 48–50, using repeated face-to-face interviews and searches of criminal records.*

Results *Bullying at age 14 predicted violent convictions between ages 15 and 20, self-reported violence at age 15–18, low job status at age 18, drug use at age 27–32, and an unsuccessful life at age 48. These results held up after controlling for explanatory and behavioural childhood risk factors at age 8–10.*

Conclusions *Bullying might increase the likelihood of these later outcomes. Interventions that decrease bullying would most likely be followed by decreases in violent offending, drug use, and unsuccessful lives. Copyright © 2011 John Wiley & Sons, Ltd.*

Introduction

The main aim of this paper is to investigate to what extent self-reported bullying in the Cambridge Study in Delinquent Development, measured at age 14, predicts later offending, and especially violent offending. In addition, the paper studies to what extent self-reported bullying predicts other life outcomes, including drug use, alcohol problems, employment problems and relationship problems, and composite measures of life success or failure at ages 32 and 48.

Several previous studies suggest that bullying predicts later offending (see Ttofi and Farrington, 2008), and there are two main reasons for this. First, bullying and offending may both be symptoms of the same underlying theoretical construct, such as anti-social tendency, which persists over time and has different behavioural manifestations at different ages. If so, bullying would not predict offending after controlling for an earlier behavioural measure of anti-social tendency. A more specific version of this hypothesis would suggest that bullying and violent offending were both symptoms of the same underlying theoretical construct, such as aggressiveness. If so, bullying would specifically predict violent

offending rather than predict general offending. With this more specific hypothesis, bullying would not predict violent offending after controlling for an earlier behavioural measure of aggressiveness.

The second possibility is that bullying increases the likelihood of later offending (or violent offending). This could occur, for example, if bullying was an earlier stage in a developmental sequence leading to offending, and if progress to each stage increased the probability of progressing to the next stage. Possibly, learning how to bully successfully, and being reinforced for bullying, could cause an increase in the underlying anti-social tendency (or aggressiveness), thereby increasing the probability of later offending (or violent offending).

In order to investigate whether bullying has a causal effect on later offending, one method would be to determine whether bullying predicted offending after controlling for earlier predictors of bullying. This is similar to propensity score matching, which would match bullies and non-bullies on the probability of bullying. A second method of investigating a causal effect would be to determine whether bullying predicted offending after controlling for earlier predictors of offending. This is similar to the comparison of predicted and actual offending rates of bullies versus non-bullies. Murray et al. (2009) considered that these methods were the most convincing ways of establishing causal risk factors after randomised experiments and controlled quasi-experimental studies investigating within-individual changes in an outcome following within-individual changes in a risk factor.

Method

Bullying and offending were measured in the Cambridge Study in Delinquent Development, which is a prospective longitudinal survey of 411 South London males (see Farrington et al., 2006, 2009). These males were first studied at age 8–9 in 1961–1962; they have been followed up to age 48 in repeated face-to-face interviews and up to age 50 in criminal records. At age 48, 93% of the males who were still alive were interviewed, and 41% of males were convicted up to age 50. Self-reported bullying (and not peer aggression in general) was measured at age 14, in four categories of a single item: definitely no, probably no, probably yes and definitely yes. Of 406 boys interviewed at this age, 71 (17.5%) said that they were definitely bullies.

Twenty key explanatory risk factors that were measured at age 8–10 were analysed in this paper; for more information about these factors, see West and Farrington (1973). All were dichotomised, with the 'worst' quarter of boys compared with the remainder (see Farrington and Loeber, 2000). All had over 95% of boys known on them. It was important to minimise the 'not known' cases because these risk factors were used in logistic regression analyses in which missing data on any one variable would eliminate the case completely from the analysis.

As the name suggests, explanatory risk factors are those that might have a causal effect on offending. High daring (taking many risks in traffic, climbing, etc.) was rated by peers and parents. Hyperactivity (lacks concentration or restless in class) was rated by teachers. Psychomotor clumsiness was measured using the Porteus Maze, the Spiral Maze and the tapping test. Low non-verbal IQ was measured using Raven's Progressive Matrices, while low verbal IQ was based on verbal comprehension and vocabulary tests. Low attainment reflected placement in a low school stream. Extraversion and neuroticism were measured using the New Junior Maudsley Inventory, and popularity was rated by peers. Height and weight were measured.

A convicted parent and a delinquent sibling were based on criminal records up to the boy's tenth birthday. Young mothers were those who were teenagers at the time of their first birth. Poor child-rearing reflected harsh or erratic parental attitude and discipline, and parental conflict. A disrupted family meant the loss of a biological parent, usually the father. Family income and family size were obtained in interviews conducted by the Study social workers; a boy came from a large family if there were five or more children by his tenth birthday. Poor housing was rated by the social workers, and low social class meant that the family breadwinner (usually the father) had an unskilled manual job.

Turning to the behavioural risk factors, troublesomeness ('gets into trouble most') was rated by teachers and peers. Anti-social personality was a composite variable that was devised as the best possible measure of this construct. It included troublesomeness, conduct problem, difficult to discipline, dishonest, has stolen, gets angry, daring, hyperactivity, clumsiness and truancy at age 8–10 (see Farrington, 1991). Because there was no direct measure of aggressiveness at age 8–10, the measure at age 12 was used. This was based on teacher ratings of: quarrelsome and aggressive, disobedient, difficult to discipline, unduly rough during playtime, over-competitive and unduly resentful to criticism or punishment (see Farrington, 1978).

The main outcome variables were based on convictions and self-reports of offending at different ages, especially 18, 32 and 48, when almost all the males were interviewed (95%, 94%, and 93%, respectively). Self-reports of drug use were also obtained at these ages. Low job status (an unskilled manual job) and a composite anti-social personality variable were measured at age 18 (see West and Farrington, 1977; Farrington, 1991). Nine comparable life outcomes were measured at ages 32 and 48 and were combined into a composite measure of life success or failure: accommodation problems (renting, poor home conditions, three or more addresses in the previous five years); relationship problems (not living with female partner, divorced in the previous five years, does not get on well with female partner); employment problems (unemployed, low social class job, low take-home pay); involved in fights, alcohol problems (driven after drinking 10 or more units of alcohol, heavy drinker, binge drinker); drug use, self-reported offending (one of six offences: burglary, theft of vehicle, theft from vehicle,

shoplifting, vandalism, theft from machine); anxious or depressed on the General Health Questionnaire, and convicted in the previous 5 years (Farrington et al., 2006).

Results

Table 1 shows the extent to which self-reported bullying at age 14 predicted later life outcomes. The odds ratio (OR) is used as the main measure of predictive accuracy; an OR of 2.0 or greater indicates a relatively strong effect (Cohen, 1996). For example, 40.8% of 71 bullies were convicted between ages 15 and 20, compared with 24.8% of 331 non-bullies searched in criminal records (i.e. not abroad or dead). The OR was 2.10, with a 95% confidence interval (CI) of 1.23 to 3.58. Because the lower confidence interval is greater than 1.0, this value of the OR is significant at $p = 0.05$, two-tailed. Because of directional predictions, one-tailed tests could be used, so p values less than 0.10 on a two-tailed test would be statistically significant on a one-tailed test.

Bullying significantly predicted convictions between ages 15 and 20 and between ages 15 and 50, but not convictions between ages 21 and 30 or between 31 and 50. Bullying was more strongly predictive of convictions for violence (assault, robbery, threats to harm or offensive weapon crimes). For example, the OR for bullying predicting violent convictions between ages 15 and 20 was 3.00. Bullying did not significantly predict self-reported delinquency, but it did significantly predict self-reported violence between ages 15 and 18 (OR = 2.23). Bullying also predicted self-reported drug use between ages 27 and 32 (OR = 2.18). Self-reported delinquency at age 42 to 47 could not be investigated because of its low prevalence (3.0%).

Bullying significantly predicted the composite measure of anti-social personality at age 18 (OR = 2.19), and remarkably, the composite measure of an unsuccessful life at age 48 (OR = 2.57). It also significantly predicted low job status at age 18 (OR = 2.37), employment problems at age 32 (OR = 1.84), and relationship problems at age 48 (OR = 1.84). The ability of self-reported bullying at age 14 to predict life outcomes at ages 32 and 48 is noteworthy.

Using ORs, Table 2 summarises relationships between the key risk factors at age 8–10, teacher-rated aggressiveness at age 12, bullying at age 14, and the seven life outcomes that were especially predicted by bullying: conviction at 15–20, violent conviction at 15–20, self-reported violence at 15–18, anti-social personality at 18, low job status at 18, drug use at 32, and an unsuccessful life at age 48. The strongest predictors of bullying were the behavioural factors of aggressiveness, troublesomeness and anti-social personality, followed by hyperactivity, low non-verbal IQ, and low weight. Generally, the smaller and lighter boys at age 8–10 tended to become delinquents in this research project.

Table 1: Percent of bullies and non-bullies with later outcomes

Later outcome (%)	Bully		Odds ratio	Confidence interval
	No	Yes		
Convicted				
15–20 (27.6)	24.8	40.8	2.10	1.23–3.58
21–30 (20.5)	19.4	25.7	1.44	0.79–2.63
31–50 (15.6)	14.2	22.1	1.70	0.89–3.27
15–50 (39.1)	36.6	49.3	1.69	1.01–2.83
Violent conviction				
15–20 (8.2)	6.3	16.9	3.00	1.40–6.43
21–30 (7.3)	6.2	12.9	2.25	0.98–5.18
31–50 (7.9)	6.5	14.7	2.48	1.11–5.54
15–50 (17.6)	15.7	26.8	1.96	1.07–3.58
SR delinquency				
15–18 (25.0)	23.3	32.4	1.57	0.90–2.76
27–32 (11.5)	11.1	13.0	1.20	0.55–2.63
SR violence				
15–18 (20.4)	17.7	32.4	2.23	1.26–3.97
27–32 (37.4)	37.6	36.8	0.97	0.56–1.66
42–47 (14.7)	14.4	16.1	1.14	0.54–2.42
SR drug use				
15–18 (31.4)	31.2	32.4	1.06	0.61–1.83
27–32 (19.5)	17.0	30.9	2.18	1.20–3.96
42–47 (17.5)	16.7	21.0	1.32	0.67–2.62
Anti-social personality 18 (22.7)	19.9	35.2	2.19	1.25–3.83
Unsuccessful life				
32 (22.1)	20.3	30.4	1.72	0.96–3.09
48 (11.4)	9.4	21.0	2.57	1.24–5.30
Low job status 18 (16.0)	13.6	27.1	2.37	1.28–4.40
Employment problems				
32 (23.9)	21.7	33.8	1.84	1.04–3.26
48 (18.0)	16.4	25.8	1.77	0.93–3.39
Relationship problems				
32 (23.2)	22.5	26.1	1.21	0.66–2.21
48 (23.8)	21.7	33.9	1.84	1.02–3.34
Alcohol problems				
32 (38.2)	37.3	42.6	1.25	0.73–2.14
48 (21.6)	20.1	29.0	1.63	0.88–3.02

Note: SR, self-reported.

As indicated by the significant ORs, most of the risk factors predicted most of the age 15–20 outcomes. More remarkably, most of these childhood risk factors predicted an unsuccessful life at age 48. The strongest predictors of this outcome were teacher-rated aggressiveness, high psychomotor clumsiness on the tests, a disrupted family, troublesomeness, the composite measure of an anti-social

Table 2: Risk factors at 8–10 versus later outcomes (odds ratios)

Risk factor 8–10	Bully	Conv	V Conv	SRV	Ant	Job	Drug	Unsucc
	14	15–20	15–20	15–18	18	18	27–32	48
High daring	–	3.71*	4.18*	3.92*	3.65*	3.64*	–	–
Hyperactive	2.14*	2.72*	3.33*	1.64	2.39*	1.84	–	2.65*
High clumsiness	1.53	1.50	1.54	–	1.65	2.38*	–	3.42*
Low non-verbal IQ	2.00*	2.02*	2.72*	1.56	2.98*	3.46*	1.61	2.48*
Low verbal IQ	1.60	1.84*	1.62	–	2.05*	3.23*	–	2.65*
Low attainment	–	2.42*	2.36*	1.80*	3.36*	2.19*	–	2.59*
High extraversion	1.59	1.59	2.01	–	–	–	–	–
High neuroticism	–	1.50	–	–	2.16*	–	–	–
Low popularity	–	1.67*	1.61	1.66	–	–	–	2.06*
Low height	1.79	1.52	1.55	1.56	1.88*	–	–	3.24*
Low weight	1.94*	–	–	–	1.69	–	–	2.44*
Convicted parent	1.65	3.93*	2.46*	2.21*	5.62*	2.91*	1.69	2.51*
Delinquent sibling	1.80	4.28*	3.49*	–	3.55*	4.93*	–	2.07
Young mother	–	2.38*	1.61	1.94*	1.61	2.78*	1.83*	1.75
Poor child rearing	1.69	2.58*	2.37*	1.63	2.70*	1.81	–	–
Disrupted family	–	2.64*	2.86*	1.85*	2.38*	2.02*	2.17*	3.29*
Low income	1.67	2.61*	2.36*	2.60*	3.47*	5.49*	–	2.05*
Poor housing	–	2.28*	1.90	2.06*	2.04*	2.62*	–	1.62
Low social class	–	1.79*	–	1.54	2.11*	–	–	2.77*
Large family size	–	2.70*	2.94*	2.58*	3.64*	3.37*	–	2.22*
Troublesome	2.60*	4.50*	4.41*	3.30*	3.82*	4.72*	–	3.29*
Anti-social	2.37*	4.92*	5.27*	2.69*	3.81*	3.16*	–	3.28*
TR aggressive	2.64*	2.48*	3.80*	3.05*	3.01*	2.62*	1.87*	3.52*

Notes: – Odds ratio below 1.50.

* $p = 0.05$, two-tailed.

V Conv, violent conviction; SRV, self-reported violence; Ant, anti-social; job, low job status; Unsucc, unsuccessful life; TR, teacher rated; TR aggressive measured at age 12.

personality and low height. Surprisingly, hardly any of these risk factors (only a disrupted family, aggressiveness and a young mother) significantly predicted drug use at age 32. As an indication that they did not possess the usual constellation of early childhood risk factors, the drug users at age 32 tended to be relatively tall at age 8–10 (26.0% of tall boys became drug users, compared to 16.7% of the remainder: OR = 1.75, CI = 1.01–3.02).

Table 3 shows the extent to which bullying predicted the seven outcomes after controlling for explanatory and behavioural risk factors in logistic regression analyses. First, relationships were investigated after controlling for the seven strongest age 8–10 explanatory predictors of bullying (hyperactivity, low non-verbal IQ, low height, low weight, convicted parent, poor child rearing and low income). All relationships were attenuated except for the prediction of drug use

Table 3: Bullying versus outcomes after controlling for risk factors

Analyses	Conv	V Conv	SRV	Ant	Job	Drug	Unsucc
	15–20	15–20	15–18	18	18	27–32	48
No controls							
Odds Ratio	2.10	3.00	2.23	2.19	2.37	2.18	2.57
Lower CI	1.23	1.40	1.26	1.25	1.28	1.20	1.24
<i>p</i> value	0.007	0.005	0.006	0.006	0.006	0.010	0.011
Controlling for 7 factors							
Partial odds ratio	1.58	2.05	1.75	1.44	1.87	2.12	2.15
Lower CI	0.86	0.89	0.94	0.75	0.92	1.12	0.98
<i>p</i> value	ns	0.093	0.078	ns	0.085	0.020	0.056
Controlling for 20 factors							
Partial odds ratio	1.49	2.02	2.02	1.52	1.65	2.44	1.72
Lower CI	0.71	0.71	0.97	0.70	0.71	1.23	0.69
<i>p</i> value	ns	ns	0.059	ns	ns	0.010	ns
Controlling for troublesomeness							
Partial odds ratio	1.64	2.32	1.82	1.75	1.83	2.27	2.12
Lower CI	0.93	1.05	1.00	0.97	0.95	1.24	1.00
<i>p</i> value	0.090	0.038	0.050	0.064	0.069	0.008	0.049
Controlling for anti-sociality ^a							
Partial odds ratio	1.54	2.22	1.78	1.64	1.82	2.15	2.08
Lower CI	0.87	1.01	0.98	0.90	0.95	1.17	0.98
<i>p</i> value	ns	0.049	0.058	ns	0.070	0.014	0.055
Controlling for TR aggressive ^a							
Partial odds ratio	1.88	2.44	1.91	1.96	2.14	2.03	2.26
Lower CI	1.08	1.10	1.05	1.10	1.13	1.11	1.08
<i>p</i> value	0.026	0.028	0.033	0.023	0.020	0.022	0.031

Notes: CI = 95%. *p* values two-tailed; *p* < 0.10 significant on one-tailed test.

^aContinuous scale

CI, confidence interval; ns, not significant; Conv, violent conviction; SRV, self-reported violence; Ant, anti-social; Job, low job status; Unsucc, unsuccessful life; TR, teacher rated.

(OR = 2.12), no doubt because these explanatory risk factors did not generally predict drug use at age 32. Nevertheless, the ORs for the prediction of violent convictions (OR = 2.05) and an unsuccessful life at age 48 (OR = 2.15) were still large.

Second, relationships were investigated after controlling for all 20 explanatory predictors at age 8–10. Bullying strongly predicted drug use (OR = 2.44) and violent convictions (OR = 2.02) as before. Bullying no longer strongly predicted an unsuccessful life at age 48 (OR = 1.72), but instead strongly predicted self-reported violence (OR = 2.02).

Third, relationships were investigated after controlling for the behavioural predictors of troublesomeness, the composite anti-social personality variable and

teacher-rated aggressiveness (using continuous measures of the latter two variables). Bullying at age 14 strongly and significantly predicted violent convictions at age 15–20, drug use at age 32 and an unsuccessful life at age 48. After controlling for aggressiveness, bullying significantly predicted all seven life outcomes.

Conclusions

Bullying at age 14 predicted later life outcomes, especially violent convictions at age 15–20, self-reported violence at age 15–18, drug use at age 27–32 and an unsuccessful life at age 48. Bullying predicted general offending and anti-social behaviour less strongly. With the noteworthy exceptions of drug use and an unsuccessful life, relationships tended to become weaker as the time interval between the bullying and the outcome increased.

These results held up after controlling for numerous childhood explanatory and behavioural risk factors. It is possible that relationships might have become weaker if more risk factors had been controlled. However, it seems unlikely that effects would completely disappear, because partial odds ratios were often much greater than 2.0, a large number of explanatory risk factors were controlled and a large number of behavioural risk factors were controlled in the continuous anti-social personality and aggressiveness measures. It seems likely that bullying would continue to be a strong predictor of violent convictions, at least.

These results suggest that bullying at age 14 might increase the probability of later life outcomes. They are less convincing than a demonstration that changes in bullying within individuals were reliably followed by changes in life outcomes within individuals. Nevertheless, they suggest that bullying specifically predicts violent offending, and that interventions that decrease bullying would most likely be followed by decreases in violent offending, drug use and unsuccessful lives.

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