

Beyond “Boys Being Boys” The Long-Term Impact of Bullying on Health and Well-Being



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Learning Objectives


Examine...

- ① link b/w bullying and mental health (MH)
- ② temporal sequence
- ③ heterogeneity in MH outcomes
- ④ moderating role of gender

Prevalence of MH Disorders in Children and Adolescents

- ☑ 13.4% = Worldwide
– Polanczyk et al., 2015
- ☑ 15-20% = Economically advanced countries
– Vaillancourt & Boylan, 2018

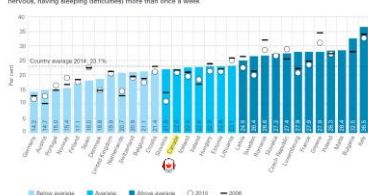
National Comorbidity Survey

- 10,123 13 to 18 year-olds 
 - Anxiety disorders = 31.9%
 - Behaviour disorders = 19.1%
 - Mood disorders = 14.3%
 - Substance use disorders = 11.4%
- With severe impairment &/or distress = 22.2%

Merikangas et al., 2010

According to UNICEF (2017) “adolescent mental health is a growing concern”

Figure 2.3 Adolescent mental health issues are becoming more common
Percentage of adolescents reporting two or more psychological symptoms (feeling low, feeling irritable, feeling nervous, having sleeping difficulties) more than once a week



Note: Estimates for Belgium and the United Kingdom are based on population weights for regional samples (including the Brussels region for Belgium, and Northern Ireland in the case of the United Kingdom). The country average is unweighted. Missing countries: Australia, Chile, Canada, Israel, Japan, Mexico, New Zealand, Republic of Korea, Turkey and the United States. Source: UNICEF, 2017; various sources.

- ☑ Suicide is the leading cause of death among youth in high income countries
 - 17.6% of all deaths
 - Particular problem for boys

Figure 3.2 Adolescent suicide rates vary widely between high-income countries
Suicide rates of adolescents aged 15–19 per 100,000 population, based on the latest available data (2009–2013)



Note: The country average is highlighted. Figures are from year averages instead of year in brackets. Each estimate is an average for the three years preceding. Data are missing for Greece. Most recent data for Iceland (2008, 5.4), Slovakia (2008, 2.5) and Slovenia (2008, 3.6). Missing countries: Cyprus, Ireland, Slovakia and Slovenia (unavailable).
Source: WHO mortality database, 2016.

Enormous continuity

- ☑ 50-75% of adult MH disorders began in childhood
- Typically before age 15

Kim-Cohen et al., 2003; Kessler et al., 2001; 2007; Weiss, 1998

JAMA Psychiatry

Original Investigation

Adult Functional Outcomes of Common Childhood Psychiatric Problems A Prospective, Longitudinal Study

William E. Copeland, PhD, Dieter Wolke, PhD, Lily Shanahan, PhD, E. Jane Costello, PhD

JAMA Psychiatry. 2017;172(8):882-893. doi:10.1001/jamapsychiatry.2016.3930
Published online July 6, 2017.

Outcome	Definition	Prevalence, %
Health		
Multiple psychiatric problems	Meeting full criteria for ≥2 different DSM disorders across all adult assessments	3.9
Multiple addictions	Meeting full criteria for DSM substance dependence for ≥2 substances across all adult assessments	5.3
Suicidality	Reporting recurrent thoughts of death (not just fear of dying), recurrent ideation, a suicide attempt, or specific plan for committing suicide	7.1
Serious physical event	Diagnosis with serious physical illness, involved in serious accident or death, physical illness and accidents had to involve risk of death or chronic disability	3.4
Legal		
Serious criminal activity	Official record of felony charge between 18 and 25 y	7.7
Incarceration	Participant reported time spent in jail or prison across adult assessments	3.3
Financial		
High school dropout	Had not received high school diploma, equivalent degree, or GED by last adult assessment	12.4
Unable to keep job	Participant reported being fired from ≥3 jobs over the course of adult assessments	6.6
Residential instability	Moved ≥5 times in 5 y	5.2
Social		
Early parenthood	Participant reported becoming a parent prior to age of majority or legal adulthood (18 y)	4.6
No social support	Participant reported no best friend/confidante, little to no relationship with parents, and rare contact with peers across all adult assessments	3.0
Relational instability	Multiple divorces	4.8

Abbreviations: GED, General Education Development.

* All percentages are weighted.

- Adults with a childhood MH disorder were 6x > to have at least 1 adverse adult outcome and 9x > to have 2 or more

- ☑ MH problems in childhood and adolescence leading cause of health-related burden
- In adults, depression is the leading cause of disability worldwide

UNICEF, 2008; Whiteford et al., 2013

Mortality in Mental Disorders and Global Disease Burden Implications A Systematic Review and Meta-analysis

Shantanu Bhatia, PhD, MPH, MD, PhD, John C. Meyer, PhD, Benjamin D. Clark, PhD, MPH

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Published online July 6, 2017.

JAMA Psychiatry

estimate that 14.3% of deaths worldwide, or approximately 8 million deaths each year, are attributable to mental disorders.

- ☑ Most youth with MH problems do not receive services
 - Only 20% receive Tx they require
- ☑ Youth with severely impairing mental disorders received Tx at 1 rates
 - ADHD and behavioural disorders

Call for action...

⬇ MH problems by ⬇ bullying

WHY?

bullying ➡ MH problems

Merikangas et al., 2011; Vaillancourt & Boylan, 2018

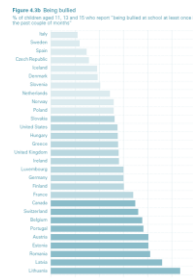
What is bullying?

- A person is being bullied if he or she is exposed repeatedly and over time, to negative actions on the part of one or more persons.
 - Three Criteria:
 - repeated over time
 - imbalance of power
 - intentionality
- Systematic abuse of power.

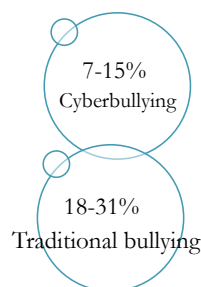
Prevalence Rate

30% bullied occasionally
7-10% bullied *on a daily basis*

- ☑ Boys are more involved than girls in bullying as targets, perpetrators, and target-perpetrators
- ☑ Gay and bisexual boys experience the highest rates of peer victimization
- ☑ Boys more likely to be bullied in single-sex schools



Cook et al., 2010; Delfabbro et al., 2006; Gee & Choe, 2014; Olsen et al., 2014; UNICEF, 2013; Vaillancourt et al., 2010a, 2010b



National Academies of Sciences, Engineering, and Medicine, 2016

Link b/w bullying and MH

- MH profile of targets
- MH profile of perpetrators



Long-Term Adult Outcomes of Peer Victimization in Childhood and Adolescence

Pathways to Adjustment and Maladjustment

Patricia McDougall University of Saskatchewan
Tanya Vallancourt University of Ottawa

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Vol. 70, No. 6, 500–510 <http://dx.doi.org/10.1037/ap0000174>

Article

Adult Health Outcomes of Childhood Bullying Victimization: Evidence From a Five-Decade Longitudinal British Birth Cohort

Ryu Takizawa, M.D., Ph.D.
Barbara Maughan, Ph.D.
Louise Arseneault, Ph.D.

Objective: The authors examined middle outcomes of childhood bullying victimization.

Method: Data were from the British National Child Development Study, a 50-year prospective cohort of births in 1 week in 1958. The authors conducted ordinal logistic and linear regressions on data from 7,771 participants whose parents reported bullying exposure at ages 7 and 11 years. Outcomes included suicidality and diagnoses of depression, anxiety disorders, and alcohol dependence at age 45; psychological distress and general health at ages 23 and 50; and cognitive functioning, socioeconomic status, social relationships, and well-being at age 50.

Results: Participants who were bullied in childhood had increased levels of psychological distress at ages 23 and 50. Victims of frequent bullying had higher rates of depression (odds ratios 1.95, 95%

CI 1.27–2.96, anxiety disorders (odds ratio 1.65, 95% CI 1.25–2.18), and suicidality (odds ratios 2.21, 95% CI 1.47–3.31) than their nonvictimized peers. The effects were similar to those of being placed in public or substitute care and an index of multiple childhood adversities, and the effects remained significant after controlling for known correlates of bullying victimization. Childhood bullying victimization was associated with a lack of social relationships, economic hardship, and poor perceived quality of life at age 50.

Conclusions: Children who are bullied—and especially those who are frequently bullied—continue to be at risk for a wide range of poor social, health, and economic outcomes nearly four decades after exposure. Interventions need to reduce bullying exposure in childhood and minimize long-term effects on victims' well-being; such interventions should cast light on causal processes.

(*Am J Psychiatry* 174:1777–784)

Long term consequences

- academic difficulties
- school truancy/avoidance
- increased absenteeism
- somatic complaints
- stress-related illness
- physical health problems
- low self-esteem
- depression
- social withdrawal/isolation
- social anxiety
- loneliness
- suicide
- aggressive behaviour

Bullied youth either get mad or they get sad.

Adult mental health consequences of peer bullying and maltreatment in childhood: two cohorts in two countries

Scott Timpone, Emma Williams, Copeland, E Jane Costello, Dieter Wolke

Summary

The adult mental health consequences of childhood maltreatment are well documented. Maltreatment by peers (i.e., bullying) has also been shown to have long-term adverse effects. We aimed to determine whether these effects are just due to being exposed to both maltreatment and bullying or whether bullying has a unique effect.

Methods: We used data from the Avon Longitudinal Study of Parents and Children in the UK (ALSPAC) and the Great Smoky Mountains Study in the USA (GSM) longitudinal studies. In ALSPAC, maltreatment was assessed as physical, emotional, or sexual abuse, or severe maladaptive parenting for both between ages 8 weeks and 8.6 years, as reported by the mother in questionnaires, and being bullied was assessed with child reports at 8, 10, and 13 years using the previously validated Bullying and Friendship Interview Schedule. In GSM, both maltreatment and bullying were previously assessed with annual parent and child interviews between ages 9 and 16 years. To identify the association between maltreatment, being bullied, and mental health problems, binary logistic regression analyses were run. The primary outcome variable was overall mental health problems (any anxiety, depression, or self-harm or suicidality).

Findings: 4026 children from the ALSPAC cohort and 1420 children from the GSM cohort provided information about bullying victimization, maltreatment, and overall mental health problems. The ALSPAC study started in 1991 and the GSM cohort enrolled participants from 1993. Compared with children who were not maltreated or bullied, children who were only maltreated were at increased risk for depression in young adulthood in models adjusted for sex and family hardships according to the GSM cohort (odds ratio [OR] 4.1, 95% CI 1.5–11.7). According to the ALSPAC cohort, those who were only being maltreated were not at increased risk for any mental health problems compared with children who were not maltreated or bullied. By contrast, those who were both maltreated and bullied were at increased risk for overall mental health problems, anxiety, and depression according to both cohorts and self-harm according to the ALSPAC cohort compared with mental children. Children who were bullied by peers only were more likely than children who were maltreated only to have mental health problems in both cohorts (ALSPAC OR 1.8, 95% CI 1.1–2.2, *p* = .005; GSM 3.3, 1.5–7.9, *p* < .0001), with differences in anxiety (GSM OR 4.9, 95% CI 2.4–12.4), depression (ALSPAC 1.7, 1.1–2.7), and self-harm (ALSPAC 1.7, 1.1–2.4) between the two cohorts.

Interpretation: Being bullied by peers in childhood had generally worse long-term adverse effects on young adults' mental health. These effects were not explained by peer victimization. The findings have important implications for public health planning and service development for dealing with peer bullying.

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	Overall mental health problems		Anxiety		Depression		Self-harm and suicidality	
	n/N ^a	OR (95% CI)	n/N ^a	OR (95% CI)	n/N ^a	OR (95% CI)	n/N ^a	OR (95% CI)
Maltreatment, being bullied, or both at some point without ever being bullied								
ALSPAC (n=4026)	—	(n=4026)	—	(n=4026)	—	(n=4026)	—	(n=4026)
Never (n=225)	33 (13%)	[reference]	—	175 (76%)	[reference]	138 (54%)	[reference]	158 (74%)
Maltreatment only (n=193)	30 (15%)	1.1 (0.5–1.4)	0.362	33 (16%)	1.2 (0.8–1.8)	0.28	26 (12%)	1.4 (0.9–1.5)
Being bullied only (n=135)	296 (25%)	1.8 (1.5–2.2)	<0.0001	156 (12%)	1.7 (1.4–2.2)	<0.0001	125 (12%)	2.1 (1.8–2.6)
Both (n=263)	81 (29%)	2.2 (1.7–2.9)	<0.0001	38 (12%)	1.4 (1.2–1.6)	0.002	40 (14%)	1.6 (1.3–1.9)
GSM (n=1420)	—	(n=1420)	—	(n=1420)	—	(n=1420)	—	(n=1420)
Never (n=482)	74 (13%)	[reference]	—	46 (6%)	[reference]	—	29 (5%)	[reference]
Maltreatment only (n=193)	50 (12%)	1.7 (0.8–3.3)	0.16	24 (8%)	1.1 (0.4–3.1)	0.13	22 (9%)	1.4 (1.2–1.6)
Being bullied only (n=252)	41 (16%)	4.7 (2.4–8.7)	<0.0001	34 (25%)	5.0 (2.4–10.3)	<0.0001	39 (18%)	6.8 (2.7–17.2)
Both (n=158)	41 (26%)	15.1 (7.7–31)	<0.0001	31 (16%)	5.1 (3.4–8.1)	<0.0001	37 (13%)	12.0 (7.4–19.5)
Maltreatment and being bullied								
ALSPAC (n=1538)	—	(n=1538)	—	(n=1538)	—	(n=1538)	—	(n=1538)
Never (n=142)	19 (13%)	[reference]	—	33 (23%)	[reference]	—	25 (17%)	[reference]
Maltreatment only (n=142)	296 (25%)	1.4 (1.1–1.7)	0.0004	156 (12%)	1.4 (0.9–2.1)	0.087	143 (12%)	1.8 (1.3–2.6)
Being bullied only (n=142)	81 (29%)	2.2 (1.7–2.9)	<0.0001	38 (12%)	1.4 (1.2–1.6)	0.002	40 (14%)	1.6 (1.3–1.9)
GSM (n=421)	—	(n=421)	—	(n=421)	—	(n=421)	—	(n=421)
Maltreatment only (n=193)	50 (12%)	[reference]	—	24 (8%)	[reference]	—	22 (9%)	[reference]
Being bullied only (n=252)	41 (16%)	2.8 (1.4–4.6)	0.006	34 (25%)	3.8 (1.6–9.3)	0.003	39 (18%)	5.2 (2.4–11.1)

OR (95% CI) ALSPAC=Avon Longitudinal Study of Parents and Children; GSM=Great Smoky Mountains Study. Being bullied refers to being bullied by peers in at least one interview. Overall mental health problems refers to having anxiety, depression, or self-harm or suicidality. For GSM percentages are weighted, sample sizes are unweighted. ^aRefers to the number of children who have the associated mental health problem.

Table 2. Mental health outcomes of maltreatment and being bullied by peers

Temporal Sequence

Bullied → poor MH?

Poor MH → bullied → poorer MH?

Temporal Sequence

Bullied → poor MH? ✓

Poor MH → bullied → poorer MH?

Internalizing Problems

- Peer victimization linked to internalizing problems in ensuing years

Arseneault et al., 2006; Faris & Felmlee, 2014; Goodman et al., 2001; Hanish & Guerra, 2002; Hodges et al., 1999; Hodges & Perry, 1999; Kumpulainen & Rasanen, 2000; Krygsman & Vaillancourt, 2017; Lee & Vaillancourt, 2018; Schwartz et al., 2005; Snyder et al., 2003; Sweeting et al., 2006; Troop-Gordon & Ladd, 2005; Vaillancourt et al., 2011, 2013; Zwierzyńska et al., 2012; see also meta-analyses by Reijntjes et al., 2010; Tiofi et al., 2011

Do the victims of school bullies tend to become depressed later in life? *Yes* A systematic review and meta-analysis of longitudinal studies

Maria M. Tiofi, David P. Farrington, Friedrich Lösel and Rolf Loeber

Maria M. Tiofi, David P. Farrington and Friedrich Lösel are based at the Institute of Criminology, Cambridge University, Cambridge, UK. Rolf Loeber is based at the Western Psychiatric Institute and Clinic, University of Pittsburgh, Pittsburgh, Pennsylvania, USA.

Abstract

Purpose - The purpose of this paper is to investigate the extent to which bullying victimization in school predicts depression in later life and whether this relation holds after controlling for other major childhood risk factors.

Design/methodology/approach - As no previous systematic review has been conducted on this topic, effect sizes are based on both published and unpublished studies. Longitudinal investigators of 28 studies have conducted specific analyses for the authors' review.

Findings - The probability of being depressed up to 38 years later (mean follow-up period of 6.9 years) was much higher for children who were bullied at school than for non-involved students (odds ratio (OR) = 1.99, 95 per cent CI: 1.71-2.32). Bullying victimization was a significant risk factor for later depression even after controlling for up to 20 (mean number of six observed) major childhood risk factors (OR = 1.74, 95 per cent CI: 1.54-1.97). Effect sizes were smaller when the follow-up period was longer and larger the younger the child was when exposed to bullying. Finally, the summary effect size was not significantly related to the number of risk factors controlled for.

Originality/value - Although causal inferences are tentative, the overall results presented in this paper indicate that bullying victimization is a major childhood risk factor that uniquely contributes to later depression. High quality effective anti-bullying programmes could be viewed as an early form of public health promotion.

Keywords Bullying; Schools; Adults; Depression

Paper type Research paper

Externalizing Problems

- Peer victimization linked to externalizing problems in ensuing years

- Barker et al., 2008; Haltigan & Vaillancourt, 2014; Hanish & Guerra, 2002; Ladd & Troop-Gordon, 2003; Smith et al., 2004; Vaillancourt et al., 2013; Yeung & Leadbeater, 2010; see also meta-analysis by Reijntjes et al., 2011



Target → perpetrator

DOI: 10.1111/jcpp.12444

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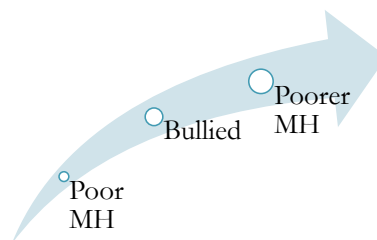
Joint Trajectories of Bullying and Peer Victimization Across Elementary and Middle School and Associations With Symptoms of Psychopathology

John D. Haltigan and Tracy Vaillancourt
University of Ottawa

The joint development of trajectories of bullying perpetration and peer victimization from Grade 1 to Grade 6 and associations with parents' and child-reported symptoms of psychopathology (anxiety, depression, attention deficit hyperactivity disorder, and conduct disorder) were examined in a large sample ($N = 693$) of Canadian children. Data reported included four distinct subgroups of children: (1) those low on both bullying perpetration and peer victimization (low-level non-involved); (2) those with moderately increasing levels of involvement in bullying perpetration and low levels of victimization (bullies); (3) those with low levels of bullying perpetration and moderate-to-high levels of peer victimization (initially bullied victims); and (4) a victim-to-bully group (characterized by increasing bullying perpetration and moderate-to-high victimization). Results suggest that a pathway from peer victimization to involvement in bullying is more likely than a pathway from bullying perpetration to peer victimization. Children classified in the victim-to-bully and bully-to-bully victim groups showed more pervasive deviations in parents' and child-reported symptoms of psychopathology across measures and stable over time in Grade 6 than individuals with limited involvement in bullying or peer victimization. Strong associations with Grade 6 parents' and child-reported symptoms of psychopathology remained even after controlling for initial symptoms of psychopathology. Results are discussed in the context of causal mechanisms of involvement in bullying, the temporal ordering between bullying and victimization, and the movement toward health risk associated with both peer victimization and bully-victim.

Keywords bullying; peer victimization; trajectory modeling; symptoms of psychopathology

- But for some, the pathway is symptoms-driven



Longitudinal Links Between Childhood Peer Victimization, Internalizing and Externalizing Problems, and Academic Functioning: Developmental Cascades

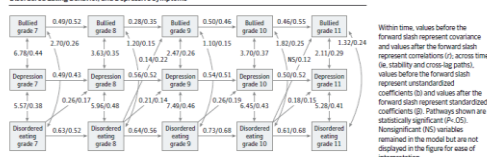
Tracy Vaillancourt · Heather L. Brittain ·
Patricia McDougall · Eric Duku



Longitudinal Associations Among Bullying by Peers, Disordered Eating Behavior, and Symptoms of Depression During Adolescence

Kirsty S. Lee, PhD; Tracy Vaillancourt, PhD

Figure. Final Model (Model 2) of the Concurrent and Longitudinal Associations Among Bullying by Peers, Disordered Eating Behavior, and Depressive Symptoms



MH profile of perpetrators

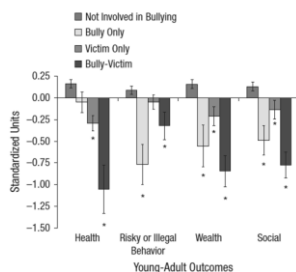


Fig. 2. Associations between childhood role in bullying and young-adult standardized outcome scales (unadjusted for childhood family hardship and childhood psychiatric problems). Across all domains, negative scores indicate more problems than the mean for the total sample, and positive scores indicate fewer problems. Asterisks indicate significant differences from the not-involved-in-bullying group ($p < .05$).

Research Article

Impact of Bullying in Childhood on Adult Health, Wealth, Crime, and Social Outcomes

Dieter Wolke¹, William E. Copeland², Adrian Angold², and E. Jane Costello²

¹Department of Psychology and Division of Mental Health and Wellbeing, University of Warwick, and ²Department of Psychiatry and Behavioral Sciences, Duke University Medical Center

Abstract

Bullying is a serious problem for schools, parents, and public-policy-makers alike. Bullying creates risks of health and social problems in childhood, but it is unclear if such risks extend into adulthood. A large cohort of children was assessed for bullying involvement in childhood and then followed up in young adulthood in an assessment of health, risky or illegal behavior, wealth, and social relationships. Victims of childhood bullying, including those that bullied others (*bully-victims*), were at increased risk of poor health, wealth, and social relationship outcomes in adulthood even after we controlled for family hardship and childhood psychiatric disorders. In contrast, pure bullies were not at increased risk of poor outcomes in adulthood once other family and childhood risk factors were taken into account. Being bullied is not a harmless rite of passage but throws a long shadow over affected people's lives. Interventions in childhood are likely to reduce long-term health and social costs.

- But when controlling for family hardship and childhood psychiatric disorders:
 - Targets at **↑** risk
 - poor health, wealth, & social-relationship outcomes in adulthood
 - Perpetrators were not at **↑** risk

Bullying Is Power: Implications for School-Based Intervention Strategies

Tracy Vaillancourt

McMaster University

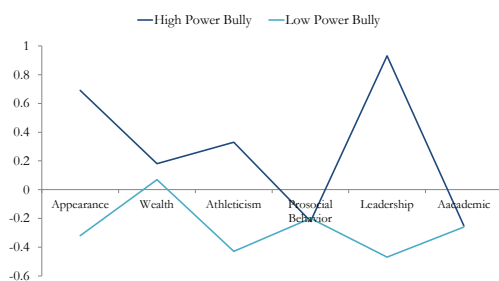
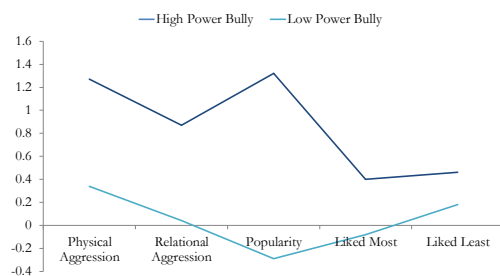
Shelley Hymel

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Patricia McDougall

University of Saskatchewan

Journal of Applied School Psychology



Why these divergent pathways?

Targets



Perpetrators



- Interferes with fundamental need to belong.
- Does not interfere with fundamental need to belong.
- Linked to high status.

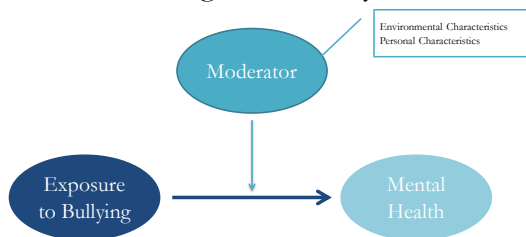
Heterogeneity in MH outcomes

- Youth bully others to achieve and maintain social status
 - Cillessen & Mayeux, 2004
 - Faris & Felmlee, 2014
 - Prinstein & Cillessen, 2003
 - Vaillancourt & Hymel, 2006; Vaillancourt et al., 2003; Vaillancourt, 2005; 2013; 2018

- Why is it that some youth are so adversely affected by bullying while others seem to cope better?



Divergent Pathways



Personal Characteristics



- Internalizing problems persisted even after bullying had stopped for girls, but not for boys.
- Boys who are bullied because of their sexual orientation experience more adverse outcome than boys who are bullied for other reasons.

Klomek et al., 2009; Rueger et al., 2011; Swearer et al., 2008; see Vaillancourt, 2013, 2017 for reviews

Environmental characteristics

- Youth with better home environments fare better than youth with poorer home environments
 - Baldry & Farrington, 2005; Flouri & Buchanan, 2002
- In classrooms where bullying emerges as central, the negative impact of victimization on mental health outcomes is greater
 - Huitsing et al., 2012

J Abnorm Child Psychol (2019) 46:11–26
DOI 10.1007/s10802-017-0342-1



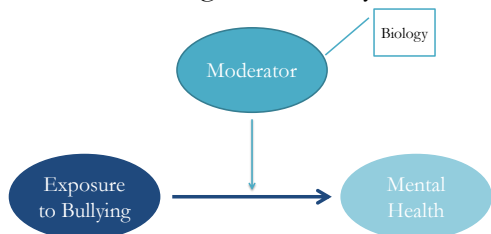
The Influence of Static and Dynamic Intrapersonal Factors on Longitudinal Patterns of Peer Victimization through Mid-adolescence: a Latent Transition Analysis

John D. Halligan^{1,2,3} · Tracy Vaillancourt^{1,2}

For boys, off-time puberty linked to peer victimization

- ☒ Late maturing boys disproportionately bullied at follow-up; especially from grade 5 to 6 (age 11 to 12)
- ☒ 22 times more likely to get bullied when compared to their on-time male peers

Divergent Pathways



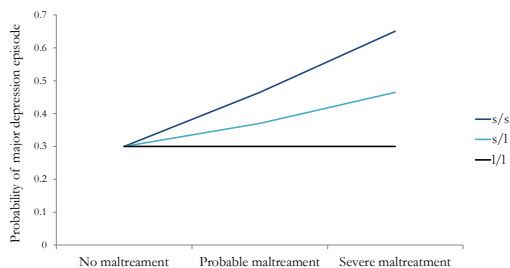
Influence of Life Stress on Depression: Moderation by a Polymorphism in the 5-HTT Gene

Avshalom Caspi,^{1,2} Karen Sugden,¹ Terrie E. Moffitt,^{1,2*} Alan Taylor,¹ Ian W. Craig,¹ Honalee Harrington,² Joseph McClay,¹ Jonathan Mill,¹ Judy Martin,³ Antony Braithwaite,⁴ Richie Poulton³

In a prospective-longitudinal study of a representative birth cohort, we tested why stressful experiences lead to depression in some people but not in others. A functional polymorphism in the promoter region of the serotonin transporter (5-HTT) gene was found to moderate the influence of stressful life events on depression. Individuals with one or two copies of the short allele of the 5-HTT promoter polymorphism exhibited more depressive symptoms, diagnosable depression, and suicidality in relation to stressful life events than individuals homozygous for the long allele. This epidemiological study thus provides evidence of a gene-by-environment interaction, in which an individual's response to environmental insults is moderated by his or her genetic makeup.

18 JULY 2003 VOL 301 SCIENCE www.sciencemag.org

Serotonin Gene, Experience, and Depression: Age 26



Replicated with bullied youth in 5 different studies

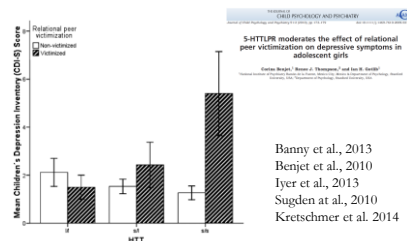


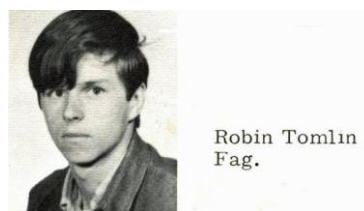
Figure 1 Depressive symptoms by genotype and relational peer victimization group. Note: l/l = homozygous for long allele; s/l = heterozygous for short and long allele; s/s = homozygous for short allele; * $t = 3.8$, $p < .01$

Banny et al., 2013
Benjet et al., 2010
Iyer et al., 2013
Sugden et al., 2010
Kretschmer et al. 2014

UN World Report on Violence against Children (2006)

- “...persistent social acceptance of some types of violence against children...”
- “...corporal punishment and other forms of cruel or degrading punishment, bullying and sexual harassment, and a range of violent traditional practices may be perceived as normal, particularly **when no lasting visible physical injury results.**”

Neurophysiological Evidence



“I feel like, emotionally, they have been beating me with a stick for 42 years”



- People can relive and re-experience social pain more easily than physical pain.
- The emotions they feel are more intense and painful.
- Physical pain is often short lived whereas social pain can last a life time.

Chen et al., 2008



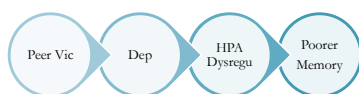
Sir Winston Churchill

“Criticism may not be agreeable, but it is necessary. It fulfills the same function as pain in the human body. It calls attention to an unhealthy state of things”

Neural Alarm

- Rejection is differentiated in less than 500 ms by children
 - Using event-related potentials (ERPs) to study neural activity that occurs when a person is rejected

Crowley et al., 2010



doi:10.1016/j.neuroim.2007.07.007

SCIAN (2009) 4, 140–157

Neural correlates of social exclusion during adolescence: understanding the distress of peer rejection

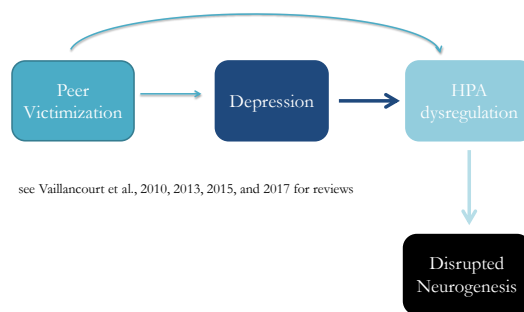
Parts of cortical physical pain network are also activated when a person is socially excluded

- Physical and social pain share similar neural structures
- Linked to evolution

Adolescents experience peer rejection, interpersonal competence, similar to teenage 10 months, having social interaction experiences displayed insular activity that was positively related to self-reported distress, and right ventrolateral prefrontal activity that was negatively related to self-reported distress. Findings unique to adolescents indicated that activity in the subgenual anterior cingulate cortex (subACC) related to greater distress, and that activity in the ventral striatum related to less distress and appeared to play a role in regulating activity in the subACC and other regions involved in emotional distress. Finally, adolescents with higher rejection sensitivity and interpersonal competence scores displayed greater neural evidence of emotional distress, and adolescents with higher interpersonal competence scores also displayed greater neural evidence of regulation, perhaps suggesting that adolescents who are vigilant regarding peer acceptance may be most sensitive to rejection experiences.

Keywords: peer rejection; adolescence; functional magnetic resonance imaging

Neuroendocrine Evidence



see Vaillancourt et al., 2010, 2013, 2015, and 2017 for reviews

A Discordant Monozygotic Twin Design Shows Blunted Cortisol Reactivity Among Bullied Children

Isabelle Ouellet-Morin, M.D., Ph.D., Andrea Danese, M.D., Ph.D., Lucy Bowles, Ph.D., Sania Shaloor, M.Sc., Antony Ambler, M.Sc., Carmine M. Pariante, M.D., M.Sc., Ph.D., Andrew S. Papadopoulos, Ph.D., Arshadom Caspi, Ph.D., Terrie E. Moffitt, Ph.D., Louise Arseneault, Ph.D.

Objective: Childhood adverse experiences are known to compromise resilience to stress.

“Results from this natural experiment provide support for a causal effect of adverse childhood experiences on the neuroendocrine response to stress”.

Environmental Risk (E-Risk) Longitudinal Twin Study, a nationally representative 1994–1995 cohort of families with twins. Results: Bullied and nonbullied MZ twins showed distinct patterns of cortisol secretion after the PST. Specifically, bullied twins exhibited a blunted cortisol response compared with their nonbullied MZ co-twins, who showed the expected increase. This difference in cortisol response to stress could not be attributed to children's genetic makeup, their familial environments, pre-existing and concomitant individual factors, or the perception of stress and emotional response to the PST. Conclusions: Results from this natural experiment provide support for a causal effect of adverse childhood experiences on the neuroendocrine response to stress. J. Am. Acad. Child Adolesc. Psychiatry. 2011;50(5):574–582. Key words: early-life stress, cortisol, HPA axis, discordant MZ twin design, bullying

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Childhood bullying involvement predicts low-grade systemic inflammation into adulthood

PNAS, 2014

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Submitted: Thomas W. McGee, Northwestern University, Evanston, IL, and accepted by the Editorial Board April 1, 2014 (received for review January 1, 2014)

Bullying is a common childhood experience that involves repeated mistreatment to improve or maintain one's status. Victims display long-term social, psychological, and health consequences, whereas bullies display material effects. The aim of this study is to test how the victim role experience is biologically embedded to affect short- or long-term levels of C-reactive protein (CRP), a marker of low-grade systemic inflammation. The prospective population-based Great Smoky Mountains Study ($n = 5,416$), with up to nine waves of data per subject, was used, covering child and adolescent ages 10 to 18 and young adulthood ages 19 and 20. Structural equations were used to assess bullying involvement and CRP levels at each observation and stayed for CRP levels. During childhood and adolescence, the number of waves of which the child was bullied predicted increasing levels of CRP although CRP levels rose for all participants from childhood into adulthood, being bullied predicted greater increases in CRP levels, whereas bullying others predicted lower increases in CRP levels. These associations remained when the sample was compared with those who were not bullied. The pattern was robust, controlling for body mass index, substance use, physical and mental health status, and exposure to other childhood play and social adversities. A child's role in bullying may serve as either a risk or a protective factor for adult low-grade inflammation, independent of other factors. Inflammation is a physiological response that mediates the effects of both social adversity and dominance on diseases in health.

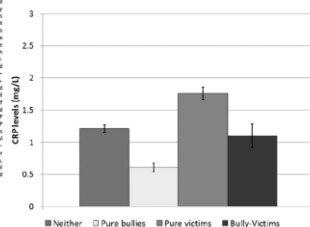


Fig. 2. Adjusted mean young adult CRP levels (milligrams per liter) based on childhood/adolescent bullying status. These values are adjusted for baseline CRP levels as well as other CRP-related covariates. All analyses used robust SEs to account for repeated observations.

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doi:10.1017/S0022321715002704

ORIGINAL ARTICLE

Increased serotonin transporter gene (*SERT*) DNA methylation is associated with bullying victimization and blunted cortisol response to stress in childhood: a longitudinal study of discordant monozygotic twins

I. Charlier-Martin¹, C. C. Y. Wong², A. Danese³, C. M. Pariante⁴, A. S. Papadopoulos⁵, J. MHP and L. Arseneault¹

• Found that...

- 1 DNA methylation of *SERT* between ages 5 and 10 for bullied twins but not for non-bullied twins, and
- 2 this was associated with blunted cortisol response to stress.

Epigenetic Evidence

- Environmental signals are translated into molecular events
- Example → DNA methylation
 - changes gene expression by activating or silencing the gene
 - childhood adversity linked to changes in DNA methylation which has an effect on later stress reactivity

Telomere erosion



Linked to normal processes like aging and ...

- health behaviour e.g., smoking and obesity
- diseases e.g., cancer, dementia, diabetes, and cardiovascular problems

Also linked to psychological stress and mortality.

Published online by Cambridge University Press 15 July 2015
doi:10.1017/S0022321715002704

ORIGINAL ARTICLE

Exposure to violence during childhood is associated with telomere erosion from 5 to 10 years of age: a longitudinal study

I. Charlier¹, C. C. Y. Wong², A. Danese³, C. M. Pariante⁴, A. S. Papadopoulos⁵, J. MHP and L. Arseneault¹

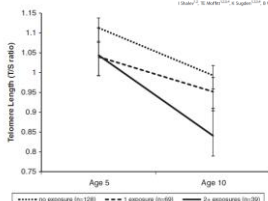


Figure 2. Association between cumulative violence exposure and telomere length at 5 and 10 years of age.

What does this all mean?



We must not approach bullying with the attitude that *boys will be boys*.

- ☑ Bullying is associated with significant impairment.
- ☑ Bullying likely becomes biologically embedded.
 - Invisible scars change a person's capacity to deal with subsequent stressors and negatively modifies their future health.

Healthy Peer Relationships Matter

