



School bullying as a predictor of violence later in life: A systematic review and meta-analysis of prospective longitudinal studies

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ABSTRACT

This paper presents results from a thorough systematic review on the efficacy of school bullying (perpetration and victimization) in predicting aggression and violence later in life. Results are based on prospective longitudinal studies. Two meta-analyses are presented examining whether: a) school bullying (perpetration and victimization) is a significant predictor of later aggression and violence, and b) whether each effect remains significant after controlling for other major childhood risk factors which were significantly related to both the predictors and the outcomes. Results are based on extensive searches of the literature. Nineteen electronic databases and 63 journals were searched from the inception of each database or journal through the end of March, 2012. Bullying perpetration at school was a significant predictor of violence (Adjusted OR = 2.04; 95% CI: 1.69–2.45) an average of six years later in life. This value of OR means that bullying perpetration increased the risk of later violence by about two-thirds. The summary effect size for bullying victimization versus violence was markedly smaller but still highly significant (Adjusted OR = 1.42; 95% CI: 1.25–1.62). This value of OR means that victimization increased the risk of later violence by about one-third. Analyses are presented of various potential moderators (such as the number of risk factors controlled for and the length of the follow-up period) in an attempt to explain the significant heterogeneity in effect sizes. Sensitivity analyses are performed on both meta-analyses, and they indicate that overall there is no evidence of publication bias. The overall findings favor the existence of a more general long-term underlying antisocial tendency rather than a more specific underlying violent tendency. Implications of our research for policy and practice are highlighted and future needs in this area of research are indicated.

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Contents

1.	Introduction	406
1.1.	The negative impact of school bullying on children's psychosocial development	406
1.2.	School bullying and violence later in life: theoretical perspectives	406
1.3.	Systematic reviews within risk factor research	407
2.	Methodology	407
2.1.	Objectives and main questions to be addressed	407
2.2.	Searching strategies	408
2.3.	Criteria for inclusion or exclusion of studies	408
2.4.	Combining effect sizes within a report relevant to an outcome measure	408
2.5.	Combining effect sizes across reports relating to the same longitudinal study	409
3.	Results	409
3.1.	Bullying perpetration at school and violence later in life: unadjusted and adjusted effect sizes	409
3.2.	Bullying perpetration at school and violence later in life: moderator analyses	409
3.3.	Bullying perpetration at school and violence later in life: publication bias analyses	409
3.4.	School bullying victimization and violence later in life: unadjusted and adjusted effect sizes	415
3.5.	School bullying victimization and violence later in life: moderator and publication bias analyses	415

Abbreviations: OR, odds ratio; 95% CI, 95 per cent confidence interval; M, mean value of a variable; SD, standard deviation of a variable.

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4. Discussion and directions for future research	415
Acknowledgments	417
References	417

1. Introduction

1.1. The negative impact of school bullying on children's psychosocial development

Bullying continues to be a serious problem plaguing school youth in both developed and developing countries (Liang, Flisher, & Lombard, 2007; Smith et al., 1999). Early longitudinal research highlighted the negative impact of school bullying on children's internalizing (e.g. depression) and externalizing (e.g., offending) behavior (e.g., Farrington, 1993; Olweus, 1991) and various reviews have synthesized research on the topic (e.g., Ttofi & Farrington, 2008).

Following a strong scientific interest in school bullying research in Scandinavian, and subsequently, other European countries, bullying has gradually become a topic of general public concern and has drawn a lot of media attention, with articles in major newspapers and magazines reporting cases of children who committed (or attempted) suicide because of severe bullying victimization at school, and parents suing school authorities for their failure to protect their offspring from continued bullying victimization (e.g., BBC Online, 2010; Boston Globe, 2010; Daily Mail, 2009; see relevant web links at the end of references).

Two special issues of journals have been organized on this topic based on our project on 'Health and criminal outcomes of children involved in school bullying' (Farrington, Ttofi, & Lösel, 2011; Ttofi, Farrington, & Lösel, 2011). Within this project, peer-reviewed papers with longitudinal data analyses are being analyzed to study the association between school bullying (perpetration and victimization) and various internalizing (e.g., anxiety, depression) and externalizing (e.g., delinquency, violence) problems. The two special issues followed the activities of a two-year international research network, in which principal investigators and research groups of 29 longitudinal studies participated by providing unpublished data in line with the aims of our project (see Farrington, Losel, Ttofi, Loeber, & Theodorakis, 2012, Table 4 for a list of participants). Both special issues of journals offered up-to-date scientific evidence on the topic and two meta-analyses were published on the efficiency of school bullying in predicting depression (Ttofi, Farrington, Lösel, & Loeber, 2011a) and offending (Ttofi, Farrington, Lösel, & Loeber, 2011b) later in life.

In an update of the aforementioned systematic reviews (Farrington et al., 2012), it was found that bullying perpetration at school was a significant predictor of offending up to about six years later (range in years: 0.42–16.50; $M = 5.84$; $SD = 4.56$), even after controlling for other major childhood risk factors (Adjusted OR: 1.89; 95% CI: 1.60–2.23). Interestingly, school bullies also had a significantly higher probability of being depressed later in life (range in years: 0.42–24.00; $M = 6.17$; $SD = 6.67$) compared with non-involved children (Adjusted OR: 1.41; 95% CI: 1.22–1.64).

Results were equally disheartening for the victims of school bullying. Farrington et al. (2012) found that bullying victimization was a significant predictor of depression up to about seven years later (range in years: 1.00–36.00; $M = 7.13$; $SD = 8.79$), even after controlling for other major childhood risk factors (Adjusted OR: 1.71; 95% CI: 1.49–1.96). Victims of school bullying also had a significantly higher probability of being involved in offending (Adjusted OR: 1.14, 95% CI: 1.00–1.31) later in life (range in years: 0.42–16.50; $M = 5.55$; $SD = 4.85$) although, admittedly, the magnitude of the summary effect size was quite small.

1.2. School bullying and violence later in life: theoretical perspectives

Longitudinal studies have shown that adult violent criminals frequently have school records of bullying and other forms of aggressive behavior (Luukkonen, Riala, Hakko, & Rasanen, 2011), suggesting the intra-generational continuity of externalizing behavior. Prospective studies have also pointed out the inter-generational continuity of school bullying. In the Cambridge Study in Delinquent Development, for example, the bullies at age 14 tended, at age 32, to have children who were also bullies (Farrington, 1993). No previous systematic review, however, has ever been conducted to calculate an *unbiased standardized effect size* on the association of school bullying with aggression and violence in adult life.

This paper addresses this gap in research literature and aims to examine whether bullying perpetration at school can significantly predict aggression and violence later in life. Given the overlap between violence victims and violent offenders (Singer, 1986), this research will focus not only on bullying perpetration but also on bullying victimization. Notably, Rivara, Shepherd, Farrington, Richmond, and Cannon (1995) found that young males treated in an Accident and Emergency Department for assault-related injuries were more likely to have a criminal record than young males treated for accidental and sporting injuries. Following this line of research, within this manuscript it is investigated whether victims of school bullying are also significantly more likely to be involved in violence later in life. We focus on prospective longitudinal studies because of the scientific superiority of longitudinal research for the holistic understanding of antisocial and criminal behavior (Blumstein, Cohen, Roth, & Visher, 1986).

A significant association between school bullying and violence later in life would have many implications both at a theoretical and a practical level. On the one hand, significant results would support the argument of a *persistent underlying violent tendency* (i.e., specific continuity of violent behavior) and would, therefore, highlight the importance of early intervention research in targeting school aggressive behavior at root before it develops into more serious forms of aggression and violence later in life. If there is, indeed, a specific and persistent continuity of aggressive and violent behavior, then special attention should be paid in designing early intervention programs specifically for aggressive and violent individuals. The argument in favor of a persistent underlying violent tendency can be supported if the summary effect size for bullying perpetration versus violence is substantially larger than the summary effect size that was found in our previous meta-analyses on bullying perpetration versus offending.

On the other hand however, and given the efficacy of school bullying in significantly predicting delinquency and offending behavior later in life (Farrington et al., 2012; Ttofi, Farrington, Lösel, et al., 2011b), significant results arising from the current systematic review would possibly favor the argument of a more *general underlying antisocial tendency*. The argument of a more general underlying antisocial tendency can be supported only if the summary effect size for bullying perpetration versus offending is more or less of the same magnitude as the summary effect size for bullying perpetration versus violence. In this case, it could be suggested that anti-bullying programs could be seen as an indirect form of both crime and violence prevention. If research directs towards a more general underlying antisocial tendency, it would then also be reasonable to suggest that

both anti-bullying and more general multiple-component programs – that address both bullying and other externalizing problems – may be equally beneficial in interrupting the continuity from school bullying to violence and offending in adult life.

Existing research supports the comorbidity of aggressive, violent and other externalizing problem behaviors and the marked shared variance in risk factors predicting these behaviors (Farrington, 2002). With regard to the argument of comorbidity of externalizing problem behaviors, based on analyses from three independent samples in the Pittsburgh Youth Study, Loeber, Farrington, Stouthamer-Loeber, and van Kammen (1998) showed that aggression, delinquency, conduct problems, and various other challenging behaviors were significantly intercorrelated, a finding which is in line with our own research on bullying perpetration at school predicting delinquency and offending later in life (Farrington et al., 2012; Ttofi, Farrington, Lösel, et al., 2011b).

With regard to the argument of the marked shared variance in risk factors predicting these externalizing behaviors, the same study (Loeber et al., 1998) also showed that these problem behaviors tended to share many risk factors. Specifically, they discovered that, of the significant risk factors for physical aggression, 84% were also significant risk factors for delinquency in the youngest sample, 82% were significant for delinquency in the middle sample, and 68% were significant for delinquency in the oldest sample.

Within the body of school research, a number of studies suggest that school bullying is also highly correlated with other conduct problems such as violent and oppositional behavior. For example, a representative study of 15,686 American students in grades 6 through 10 in public and private schools (Nansel, Overpeck, Haynie, Ruan, & Scheidt, 2003) found that both perpetrators and victims of bullying behavior had a higher probability of weapon carrying compared with non-involved children, not just in school (adjusted ORs of 2.6 and 1.5 accordingly), but also away from school (adjusted ORs of 5.9 and 4.1 respectively). Another study (Kokkinos & Panayiotou, 2004) found that CD symptomatology was predictive of bullying perpetration whereas ODD was predictive of bullying victimization.

Notably, school bullying shares many risk factors with offending (Lösel & Bliesener, 2003), behavioral conduct (Boulton, Smith, & Cowie, 2010), and other externalizing behaviors, such as hyperactivity. For instance, longitudinal data analyses of the Cambridge Study in Delinquent Development show that low non-verbal intelligence (OR: 2.0), low attainment (OR: 1.8), hyperactivity (OR: 2.1), and having a convicted parent (OR: 1.7) at ages 8–10 significantly predicted bullying perpetration at age 14 (Farrington & Baldry, 2010). In the same study, bullying at age 14 significantly predicted antisocial behavior at age 18 (OR: 2.2).

To conclude, the issue of whether school bullying and other externalizing behaviors later in life are different age- and context-related manifestations of the same underlying antisocial dispositions has many implications at both the theoretical and practical level. Previous research has not given an answer to this matter and it is hoped that this paper will address adequately this issue.

Another important question is whether involvement in bullying influences the individual in such a way as to engender more aggressive and violent behavior later in life. Establishing a *causal* long-term link between school bullying and violence in adult life, or establishing that bullying is in some way a 'stepping stone' towards violence, is a very demanding task and beyond the aims of the current research. A similar question is central in an ongoing debate within the field of criminology regarding the explanation of the strong correlation between prior and future criminal activity.

Some researchers have argued in favor of the theoretical model of 'state dependence', suggesting that the experience of crime materially influences the individual in such a way as to engender more crime in the future because of its undesirable effect on social bonds, conventional attachments and so forth. Other researchers have argued in favor of 'population heterogeneity', suggesting that the correlation

between past and future criminal behavior could be attributed to the persistence of time-stable individual differences in an anti-social characteristic between persons which can take various forms across life. Finally, others have suggested a combination of the above two explanations (for a summary of research, see Nagin & Paternoster, 2000).

Transferring the above theoretical model into the area of research on school aggression, one may ask the following question: Could school bullying have a causal effect on later violence (i.e., 'state dependence' argument) because, for example, involvement in bullying results in poorer school bonding, which in turn facilitates the increasing intensity of aggressive behaviors? Or is it the case that a strong association between school bullying and violence later in life could merely reflect the persistence of an underlying anti-social tendency (i.e., 'population heterogeneity' argument)? Although this matter is beyond the aims of the current research, it is of great importance and it is essential to articulate.

1.3. Systematic reviews within risk factor research

To date, systematic reviews in criminology (and also in other fields) have focused primarily on intervention research, failing to address naturally occurring (i.e., non-manipulated) causes of delinquency or other externalizing and internalizing problems. Examples of naturally occurring/non-manipulated causes of internalizing and externalizing problems could include divorce, brain damage, parental incarceration or, with reference to the current research, school bullying (Murray, Farrington, & Eisner, 2009).

In risk factor research, many naturally occurring probabilistic events (such as broken homes or getting married) cannot be randomly assigned due to ethical or other considerations (Petrosino, 2003). Even though children are not allocated to victim versus non-victim status in a planned manner, bullying victimization can be regarded as a 'social intervention' with specific outcomes. Our analyses will also include bullying perpetration.

Systematic reviews on risk factors could advance theory and also help to develop effective prevention programs (Murray et al., 2009). For example, it would be interesting to examine whether victims of bullying suffer from low self-esteem or whether school bullies lack empathy. Such findings, based on relevant systematic reviews, could guide future intervention initiatives, while also refining theories about possible causes of bullying behavior.

Establishing a significant long-term link between school bullying and violence in adult life could potentially have important implications for policy and practice. It would give a stronger voice to anti-bullying agencies and would also re-establish the moral imperative of school communities to create an appropriate violence-free school climate for all youngsters.

2. Methodology

2.1. Objectives and main questions to be addressed

Our objective is to conduct a systematic review and calculate standardized effect sizes with the final aim of:

- Establishing whether there is indeed an association between bullying at school (perpetration and victimization) and aggressive or violent behavior later in life.
- Establishing the unique contribution (i.e., after controlling for covariates) of school bullying across time (predictive efficacy).
- Establishing what covariates (e.g., age at which bullying was measured; length of follow-up period; number of risk factors controlled for) are independently related to the adjusted effect sizes.

In order to establish whether school bullying *per se* is followed by an increase in aggression or violence, it is important to investigate

whether this factor predicts the outcome after controlling for earlier risk factors that predict both school bullying and the outcome (Murray et al., 2009). It should be stressed that authors were explicitly told that all results were important irrespective of their statistical significance and in fact this can be seen in the published papers of the two edited volumes (Farrington, Ttofi & Lösel, 2011; Ttofi, Farrington, & Lösel, 2011). Obviously, we had no control over the conclusions drawn from published papers, but it is reassuring that the majority of the studies analyzed here were based on solicited contributions from bullying researchers.

All contributors were asked to investigate: (a) the strength of the relationship between school bullying and later outcomes (in this case, aggression or violence), and (b) the strength of this relationship after controlling for earlier major childhood risk factors (e.g., child, parental, child-rearing, peer, school, socioeconomic, and neighborhood). They were not asked to study whether changes in school bullying (perpetration or victimization) predicted changes in the outcome, partly because this would have required more data waves and partly because such change variables are likely to have great variability.

2.2. Searching strategies

Extensive searches were carried out and a detailed description of them can be found in the report that we have prepared for the Swedish National Council for Crime Prevention (Farrington et al., 2012). In total, we carried out the same searching strategies in 19 electronic databases and hand-searched, either online or in print, a total of 63 journals. The first author also has a subscription with Zetoc database, which covers tables of contents of journals from 1993 to date and is updated on a daily basis.

2.3. Criteria for inclusion or exclusion of studies

The following inclusion criteria were set *in advance* for both published and unpublished reports:

- The report clearly indicates that it is concerned with school bullying (perpetration/victimization) and not with other more general forms of peer aggression and victimization. The predictor involves school bullying only. The definition of school bullying includes several key elements: physical, verbal, or psychological attack or intimidation that is intended to cause fear, distress, or harm to the victim; an imbalance of power (psychological or physical) with a more powerful child (or children) oppressing less powerful ones without any provocation; and repeated incidents between the same children over a prolonged period of time (Farrington, 1993; Olweus, 1993a). According to this definition, it is not bullying when two persons of the same strength (physical, psychological, or verbal) victimize each other. School bullying can occur in school or on the way to or from school. Bullying is a special type of aggressive behavior, but it should not be equated with aggression (Salmivalli & Nieminen, 2002).
- At Time 2/Wave 2, the outcome variable of interest is aggression (e.g., fighting) or violence (including criminal violence and violent offending) against humans. Consequently, studies on the association of school bullying with aggression or violence against animals (e.g., Tapia, 1971) were excluded. Violence includes behaviors such as assault, forced sexual contact, carrying a handgun, shooting with a firearm, beating, robbery, and rape. We also included three studies with both direct (e.g., fighting) and indirect (e.g., spreading rumors) measures of aggression as an outcome measure.
- The report presents data that are prospective longitudinal in character.
- Chronologically, the predictor (i.e., bullying perpetration/victimization) precedes the outcome (i.e., aggression or violence).

- At Time 1/Wave 1 (i.e., when bullying was measured), study participants were school-aged children from the community.
- The report has quantitative data and enough statistical information to allow the calculation of an effect size. One study with relevant data (Rahey, 2007) was excluded because of inadequate statistical information.
- Published and unpublished reports of the literature were included: books (e.g., Olweus, 1993a), book chapters (e.g., Olweus, 1991), journal articles, government reports, Masters or PhD theses (e.g., Pessall, 2001; Rahey, 2007; Wong, 2009), and conference presentations (e.g., Lösel et al., 2008). As mentioned earlier, data were also obtained via email communication with Principal Investigators and researchers of major longitudinal studies (e.g., Henry et al., 2010a, 2010b; Homel, 2011).

For the aims of the current paper, studies are excluded if:

- The character of the data is qualitative in nature (e.g., qualitative data based on interviews) and does not allow calculation of an effect size. This does not apply if a qualitative method (e.g., interviews or observation studies) was used to obtain a quantitative measure.
- The outcome measure (aggression or violence) is part of a wider theoretical construct (e.g., externalizing or anti-social behavior). Thus, studies on well-validated psychometric scales (e.g., the CBCL), which included aggression items along with other externalizing problems, were excluded (e.g., Arseneault, 2011; Bowes et al., 2009; Bowes, Maughan, Caspi, Moffitt, & Arseneault, 2010; Shakoor et al., 2011). This was also the case with the Kim, Leventhal, Koh, Hubbard, and Boyce (2006, p. 1036) paper, in which aggression was defined as 'being argumentative, defiant, fighting, aggressive or cruel'. Studies in which aggression was combined with 'negative affect' (e.g., frown or cry) were also excluded (e.g., Pellegrini, 2001). In one study (Camodeca, Goossens, Meerum, & Schuengel, 2002), the outcome measure (i.e., reactive/proactive aggression) included items on bullying (i.e., 'Threatens and bullies others'), and the study was excluded because these items were not disentangled. Similarly, studies in which outcomes of interest (e.g., fighting, weapon carrying, robbery, assault) were part of a total delinquency or offending scale were excluded (Barker, Arseneault, Brendgen, Fontaine, & Maughan, 2008; Farrington, Loeber, Stallings, & Ttofi, 2011; Smith & Ecob, 2007; White & Loeber, 2008). Involvement in playing violent video games (e.g., Ferguson, 2011) was not used as a proxy for violence.
- Studies in which a retrospective measure of school bullying was used as a predictor (i.e., retrospective longitudinal studies) were excluded since there is no control of retrospective bias in such designs (e.g., Azzuzi & Killias, 2010; Pessall, 2001).
- Results of studies should be based on children from the community (and not on clinic samples – e.g., Halt, 2011; Luukkonen et al., 2011 – or prison samples) so that results could be generalizable to the general school population.

2.4. Combining effect sizes within a report relevant to an outcome measure

Within each manuscript more than one effect size could be reported which could be categorized under violence or aggression. When choosing an appropriate effect size that would justify inclusion of a report in either meta-analysis (bullying perpetration or victimization versus the outcome), the following rules were set:

- Within a report, if different effect sizes were reported for fighting, hitting, assault, robbery, rape, criminal violence, and the like, these were combined into one effect size. However, if a report provided a general measure of aggression or violence as well as any of the above individual items, then we have chosen to include the general measure in the meta-analysis. This was done to avoid the possibility of obtaining an overestimated effect size.