



Published in final edited form as:

*J Abnorm Child Psychol.* 2011 April ; 39(3): 379–387. doi:10.1007/s10802-010-9463-5.

## Mothers and Children as Informants of Bullying Victimization: Results from an Epidemiological Cohort of Children

**Sania Shakoor,**

MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, Box Number p080, London SE5 8AF, UK

**Sara R. Jaffee,**

MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, Box Number p080, London SE5 8AF, UK

**Penelope Andreou,**

MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, Box Number p080, London SE5 8AF, UK

**Lucy Bowes,**

MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, Box Number p080, London SE5 8AF, UK

**Antony P. Ambler,**

MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, Box Number p080, London SE5 8AF, UK

**Avshalom Caspi,**

MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, Box Number p080, London SE5 8AF, UK

Departments of Psychology and Neuroscience, Psychiatry and Behavioral Sciences, and Institute for Genome Sciences and Policy, Duke University, Durham, NC, USA

**Terrie E. Moffitt,** and

MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, Box Number p080, London SE5 8AF, UK

Departments of Psychology and Neuroscience, Psychiatry and Behavioral Sciences, and Institute for Genome Sciences and Policy, Duke University, Durham, NC, USA

**Louise Arseneault**

MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, Box Number p080, London SE5 8AF, UK

Louise Arseneault: [louise.arseneault@kc1.ac.uk](mailto:louise.arseneault@kc1.ac.uk)

### Abstract

Stressful events early in life can affect children's mental health problems. Collecting valid and reliable information about children's bad experiences is important for research and clinical purposes. This study aimed to (1) investigate whether mothers and children provide valid reports of bullying victimization, (2) examine the inter-rater reliability between the two informants, (3) test the predictive validity of their reports with children's emotional and behavioral problems and (4) compare the genetic and environmental etiology of bullying victimization as reported by mothers and children. We assessed bullying victimization in the Environmental-Risk (E-Risk) Longitudinal Twin Study, a nationally-representative sample of 1,116 families with twins. We collected reports from mothers and children during private interviews, including detailed narratives. Findings showed that we can rely on mothers and children as informants of bullying victimization: both informants provided information which adhered to the definition of bullying as involving repeated hurtful actions between peers in the presence of a power imbalance. Although mothers and children modestly agreed with each other about who was bullied during primary and secondary school, reports of bullying victimization from both informants were similarly associated with children's emotional and behavioral problems and provided similar estimates of genetic and environmental influences. Findings from this study suggest that collecting information from multiple informants is ideal to capture all instances of bullying victimization. However, in the absence of child self-reports, mothers can be considered as a viable alternative, and vice versa.

## Keywords

Informant; Bullying victimization; Agreement; Validity; Reliability

---

The selection of informants is pivotal in developmental research to assess early-life stressors and their impact upon children's development. Low agreement between different informants' reports of emotional, behavioral and social problems has generated uncertainty about who can report accurately on children's experiences and behaviors (Achenbach et al. 1987; De Los and Kazdin 2005). Children provide self-perceptions and global views of their experiences across various settings. However, relying on young children as informants can be problematic. Some may be reluctant to report stressful or embarrassing experiences such as bullying victimization (Ladd and Kochenderfer-Ladd 2002; Olweus 2009). Furthermore, young children may not have yet developed adequate cognitive abilities to comprehend the concepts being assessed (Measelle et al. 1998), or recognize their involvement in certain activities. The use of adults as informants would counteract these limitations. However, adults are largely dependent upon being informed about children's experiences as they often take place in their absence. As both children's and adults' reports have some drawbacks, it remains unclear who should be considered as an adequate informant of children's stressful experiences such as bullying. This study aims to test whether mothers and children are valid and reliable informants for developmental and bullying research.

Being bullied is a common stressful life experience affecting on average 13% of children and adolescents during a school year, worldwide (Craig et al. 2009). Bullying behaviors are distinct from other forms of aggressive behaviors. They are characterized by repeated hurtful actions between peers where a power imbalance exists. The repetition of these behaviors overtime results in a pattern of interactions being established between victims and bullies.

These interactions are characterized by factors which encompass a power imbalance (i.e. physical strength, age or popularity), whereby it is difficult for the victim to defend him or herself. These behaviors are manifested in two ways (Olweus 1993, 1994); (1) direct, which includes acts of aggression and assault that are conducted in a relatively open manner, and (2) indirect, which includes exclusion, social isolation and manipulation of friendship groups. Researchers have observed gender differences amongst these behaviors with direct bullying being more frequent amongst boys, and indirect bullying more frequent amongst girls (Card et al. 2008; Bjorkqvist et al. 1992; Rivers and Smith 1994).

Being bullied can be a stable stressor in young children's lives (Barker et al. 2008a; Scholte et al. 2007) and contributes towards their mental health problems. Victims have reported elevated levels of emotional and behavioral problems (Arseneault et al. 2006; Kim et al. 2005, 2006; Nansel et al. 2004; Sourander et al. 2007; Wolke et al. 2000), self harm and suicidality (Barker et al. 2008a; Herba et al. 2008; Klomek et al. 2009) and psychotic symptoms (Arseneault et al. 2011; Schreier et al. 2009). These associated adversities highlight bullying victimization as a life stressor which requires attention. To fully capture the impact of being bullied on children's outcomes, we need to ensure that research measures take into account the specificity of bullying victimization by ascertaining that reports adhere to its definition. We examined validity of mothers' and children's reports of being bullied using detailed narratives describing what happened.

Levels of agreement between informants who report on children's lives are generally low. Correlations ranging between 0.25 and 0.40 have been reported between parents' and children's reports of emotional and behavioral problems (Achenbach et al. 1987; Rey et al. 1992; Sourander et al. 1999) and 0.17 to 0.42 between parents and teachers (Achenbach et al. 1987; Gross et al. 2004). However, higher correlations have been found between mothers' and fathers' reports of children's behavior ( $r=0.60$ ; Achenbach et al. 1987). The modest correlations between children, parents and teachers suggest that discrepancies in reports from different informants do not alone reflect children's limited capacity to report accurately on their experiences. Low agreement could be an indication that each informant contributes unique and valuable information (Achenbach 2006). We investigated the agreement between mothers' and children's reports of being bullied during primary and secondary school to establish inter-rater reliability.

Uncertainty regarding the validity of, and agreement between, mothers' and children's reports of being bullied raises questions about previously reported associations between bullying victimization and children's emotional and behavioral problems. Studies have consistently shown that victims of bullying have elevated levels of emotional and behavioral problems in comparison to non-bullied children (for a review see Arseneault et al. 2010). However, these associations could be biased or spurious if they are based on reports from informants who cannot provide valid information about children's bullying experiences. We tested the predictive validity of mothers' and children's reports of being bullied with emotional and behavioral problems.

This uncertainty extends to etiological factors involved in children's predisposition to being bullied. Research shows that being a victim of bullying is more than being in the wrong

place at the wrong time. A number of individual, school and family risk factors contribute to this risk (Arseneault et al. 2010). Studies have identified exposure to domestic violence, child maltreatment (Bowes et al. 2009), emotional and behavioral problems (Arseneault et al. 2006; Barker et al. 2008b; Ladd and Troop-Gordon 2003), low self worth and reduced assertiveness (Egan and Perry 1998) to increase children's risk of being bullied. However, research investigating genetic factors is limited. Based on information reported by mothers, some evidence suggests that children have an important genetic susceptibility to being bullied (Ball et al. 2008). In contrast, others using peer nominations, suggest that being bullied is environmentally driven and unrelated to a child's genetic predisposition (Brendgen et al. 2008). It remains unclear whether these findings are informant specific. We compared genetic and environmental factors involved in the etiology of mothers' and children's reports of being bullied.

Trends in current research emphasize the importance of reliably identifying bullying experiences early in life as an important risk factor for children's mental health problems. There is growing evidence showing that bullying victimization occurs not only amongst adolescents but also amongst young children who have just entered the schooling system (Barker et al. 2008b; Perren and Alsaker 2006). As a consequence, bullying research has witnessed a shift away from traditional school based surveys of adolescents towards epidemiological cohorts of young children. It is important to ensure that measures of bullying victimization, are adapted to this change.

Using data collected from multiple informants in a nationally-representative cohort of young twins, this study aims to investigate whether mothers and children provide valid and reliable reports of victimization.

## Methods

### Sample

Participants were members of the Environmental Risk (E-Risk) Longitudinal Twin Study, which tracks the development of a nationally-representative birth cohort of 2,232 British children. The sample was drawn from a larger birth register of twins born in England and Wales in 1994–1995 (Trouton et al. 2002). Briefly, the E-Risk sample was constructed in 1999–2000, when 1,116 families with same-sex 5-year-old twins (93% of those eligible) participated in home-visit assessments. Families were recruited to represent the UK population of families with newborns in the 1990's, based on (a) residential location throughout England and Wales and (b) mother's age (i.e., older mothers having twins via assisted reproduction were under-selected and teen-aged mothers with twins were over-selected). We used this sampling to (a) replace high-risk families who were selectively lost to the register via non-response and (b) ensure sufficient numbers of children growing up in high-risk environments. Follow-ups were conducted when the children were aged 7 years (98% participation,  $N=2,191$ ), 10 years (96%,  $N=2,143$ ) and, 12 years (96%,  $N=2,143$ ).

Zygosity was determined using a standard zygosity questionnaire, which has been shown to have 95% accuracy (Price et al. 2000). Ambiguous cases were zygosity-typed using DNA. The sample includes 55% monozygotic (MZ) twins and 45% dizygotic (DZ) twins. Sex is

evenly distributed within zygosity (49% male). Parents gave informed consent and children gave assent. The Joint South London and Maudsley and the Institute of Psychiatry Research Ethics Committee approved each phase of the study.

### **Bullying Victimization**

We used mothers' and children's reports to assess bullying victimization (hereafter referred to as "victimization") during primary and secondary school. We explained that "someone is being bullied when another child (1) says mean and hurtful things, makes fun or calls a person mean and hurtful names; (2) completely ignores or excludes someone from their group of friends or leaves them out of things on purpose; (3) hits, kicks, or shoves a person, or locks them in a room; (4) tells lies or spreads rumors about them; and (5) other hurtful things like these. We call it bullying when these things happen often, and it is difficult for the person being bullied to stop it happening. We do not call it bullying when it is done in a friendly or playful way". Mothers were interviewed when children were 7, 10 and 12 years, and were asked whether either twin had been bullied by another child, responding "never", "yes", or "frequent". During interviews at age 7, mothers were asked to report on their children's experiences from school entry at age 5. When victimization was reported, interviewers followed by asking for details about what happened. For example, a mother reported "at school, 2–3 boys in his class, call him names, push and trip him up. This has been happening every week". We combined mothers' reports at age 7 and 10 to derive a measure of victimization during primary school. Mothers' reports at age 12 indexed victimization during secondary school. The test–retest reliability of reports of bullying was 0.87 using a sample of 30 parents who were interviewed twice, 3 to 6 weeks apart. When they were 12 years, children indicated during private interviews whether they had been bullied by another child and if this occurred in primary or secondary school.

We created a group of bullied children by combining those who reported "yes" or "frequent" to being bullied. The vast majority of bullying experiences occurred after school entry, after the age of 5 years. A total of 43% of children ( $N=956$ ) were reported by their mother as having been bullied during primary school and 36% ( $N=772$ ) during secondary school. Nearly 41% of children ( $N=871$ ) self-reported being bullied during primary school and 27% ( $N=578$ ) during secondary school. The present study covers a period ranging from age 5 through to age 12 which is longer compared to other studies which have reported lower prevalence rates (Craig et al. 2009).

### **Children's Emotional and Behavioral Problems**

We assessed emotional and behavioral problems when children were 12 years using the Child Behavior Checklist for mothers (Achenbach 1991a) and the Teacher's Report Form for teachers (Achenbach 1991b). Mothers were given the instrument as a face-to-face interview and teachers responded by mail. The reporting period was 6 months before the interview. Informants were asked to rate each item as being "not true" (0), "sometimes true" (1), or "very true" (2). The emotional problems scale is the sum of 23 items from the CBCL and 27 items from the TRF on the Withdrawn and Anxious/Depressed scales, including items such as "cries a lot", "withdrawn, doesn't get involved with others", and "worries" (Somatic Complaints were not included, as this scale was not assessed at age 12). Mothers'

scores ranged from 0 to 34 ( $M=6.45$ ,  $SD=5.71$ ) and teachers' scores ranged from 0 to 43 ( $M=4.51$ ,  $SD=5.50$ ). The internal consistency reliability score for mothers was 0.87 and 0.89 for teachers. The behavioral problems scale is the sum of 35 items from the CBCL and 34 items from the TRF in the Aggressive and Delinquent behaviors scales including items such as "argues a lot", and "is cruel or nasty to other people". Mothers' scores ranged from 0 to 55 ( $M=10.14$ ,  $SD=8.84$ ), and teachers' scores ranged from 0 to 56 ( $M=5.51$ ,  $SD=9.50$ ). The internal consistency reliability score for mothers was 0.91 and 0.96 for teachers. The mother and teacher reports were standardized and summed to create composite measures of emotional and behavioral problems at 12 years because mothers and teachers provide unique information about children's behaviour and because simple combination rules work as well, if not better than, more complicated ones (Bird et al. 1992; Piacentini et al. 1992).

### Statistical Analyses

Firstly, focusing on the bullied children only, we rated the extent to which mothers' and children's reports of victimization during secondary school showed evidence that bullying was (1) perpetrated by peers, (2) repeated instances over time and (3) occurred with a power imbalance between the bully and the victim. These criteria were coded as '1' when there was evidence supporting the criterion in the narratives and '0' when there was not. When no information was provided, narratives were coded as missing. Using 96 mothers' reports of victimization, we found an inter-rater reliability kappa of 0.81 for the behaviors being perpetrated by a peer, 0.92 for it being experienced over time, and 0.82 for the presence of a power imbalance. An overall inter-rater reliability kappa of 0.85 was observed between the raters across all 3 criteria.

The complete sample of children was used for the remaining analyses. Secondly, we examined the agreement between mothers' and children's reports of being bullied during primary and secondary school by calculating the percentage of cases where mothers and children agreed with one another. We also calculated kappa coefficients. Thirdly, we tested the associations between mothers' and children's reports of victimization during primary and secondary school with children's emotional and behavioral problems at 12 years with regression analyses controlling for the effect of gender.

Fourthly, we compared etiological factors influencing victimization from mothers' and children's reports using tetrachoric correlations. Genetic and environmental influences on victimization were derived using Falconer's equation (Plomin et al. 2001). This equation stipulates that the genetic contribution to victimization is estimated as twice the difference between MZ and DZ correlations ( $A = 2(r_{mz} - r_{dz})$ ) where A is the genetic contribution,  $r_{mz}$  is the MZ twin correlation and  $r_{dz}$  is the DZ twin correlation. The contribution of the common environment (C) is the difference between the MZ correlation and the genetic estimate ( $C = r_{mz} - A$ ). The contribution of the unique environment (E) is calculated by subtracting the MZ correlation from 1 ( $E = 1 - r_{mz}$ ). We chose Falconer's equation in favor of structural equation modeling due to the simplicity of the method and its ability to portray the comparability in estimates using data from the two informants.

We did not find significant gender effects across our four analytical steps, thus all analyses were conducted collapsed across gender. Each family contained data for two children, which

resulted in non independent observations. All analyses adjusted for with tests based on the sandwich or Huber/White variance estimator (Williams 2000). All statistical analyses were conducted using Stata 9.0 (STATA 2005).

## Results

### Construct Validity of Mothers' and Children's Reports of Victimization

Mothers and children reported information which adhered to the definition of victimization. When mothers reported that their child had been bullied during secondary school, 96% recalled that bullying was perpetrated by peers, 75% recounted it was repeated over time, and 84% reported evidence of a power imbalance between the bully and the victim. A total of 86% of mothers' reports showed evidence for at least 2 of the criteria for victimization. In comparison, when children reported having been bullied during secondary school, 99% recounted the behaviors to have been perpetrated by peers, 61% recalled bullying to have been experienced repeatedly over time, and 81% reported evidence of a power imbalance. A total of 85% of children reported at least 2 of the criteria for victimization.

### Inter-Ritter Reliability Between Mothers' and Children's Reports of Victimization

We found modest agreement between mothers' and children's reports of victimization experiences (Table 1). Amongst 956 children identified by their mothers as being bullied during primary school, 52% reported themselves being bullied. Amongst 871 children who self-reported being bullied, 56% were also identified by their mothers as being bullied during primary school. Amongst 772 children reported by their mothers to have been bullied during secondary school, 45% agreed with these reports. In contrast, amongst 578 children who reported being bullied during secondary school, 60% were also identified by their mothers as having been bullied. The kappa coefficient for victimization was 0.20 during primary school and 0.29 during secondary school.

### Predictive Validity of Mothers' and Children's Reports of Victimization with Children's Emotional and Behavioral Problems

Victims of bullying, as identified by mothers and by children, had significantly higher levels of emotional and behavioral problems at age 12 when compared to non-bullied children (Table 2). Mothers' reports yielded slightly larger effect sizes compared to those calculated using children's reports when victimization occurred during primary school (0.39 vs. 0.17 for emotional problems; 0.27 vs. 0.15 for behavioral problems). When victimization occurred during secondary school, effect sizes increased for both informants and mothers' reports still yielded slightly larger effect sizes compared to those calculated using children's reports (0.57 vs. 0.42 for emotional problems; 0.41 vs. 0.38 for behavioral problems). Although overall effect sizes calculated using mothers' reports were greater than those for children's reports, they were not significantly different as indicated by overlapping confidence intervals.

### Genetic and Environmental Influences on Mothers' and Children's Reports of Victimization

Estimates of genetic and environmental influences on victimization were similar for both mothers' and children's reports (Table 3). At primary school, genetic contribution to

victimization was 0.54 using mothers' reports and 0.32 using children's reports while unique environmental contribution was 0.31 according to mothers and 0.43 for children. The contribution of common environmental influences was 0.15 using mothers' information and 0.25 with details from children's reports. For both informants, genetic influences remained similar at secondary school (0.47 for mothers vs. 0.40 for children). Unique influences from the environment slightly decreased across time but remained similar across informants (0.21 for mothers vs. 0.34 for children). The estimate for common environmental influences increased to 0.32 using mothers' reports while the one using children's reports stayed close to the estimate in primary school (0.26).

## Discussion

Our study shows that mothers and children are valid and reliable informants of victimization, a common early-life stressor. Using data from a large representative cohort of young children, findings indicated that mothers and children report information which adheres to the definition of victimization. Both informants reported information on victimization that was similarly associated with children's emotional and behavioral problems. Estimates of genetic and environmental influences on victimization were similar for reports provided by mothers and children. Mothers and children tended to agree with one another about who was bullied in primary and secondary school, but they failed to agree completely, therefore collecting data from multiple informants is ideal to capture all instances of victimization. However, in the absence of child self-reports, mothers can be considered as a viable alternative, and vice versa.

Results indicated that both mothers and children report information which matched the definition of victimization. The lowest adherence to the definition and greatest discrepancies between informants were observed for the 'repeatedly over time' criterion. It is plausible that children, more so than mothers, are mistaking single incidences of aggressive peer behaviors (e.g. a playground fight) for bullying. Providing a definition of bullying during the interview may help increase accuracy and reduce confusion about the concept being assessed. Collecting informants' narratives may also be useful for validating the data collected and cross-referencing the information with the definition of bullying. Our research protocol was not designed to gather narratives specifically in relation to the 3 criteria for victimization. Future studies should include probes targeting specific criteria to assess the validity of bullying data.

In keeping with previous studies assessing informant agreement of reports of emotional and behavioral problems (Achenbach et al. 1987; Rey et al. 1992; Sourander et al. 1999), and victimization (Ladd and Kochenderfer-Ladd 2002; Ronning et al. 2009; Wienke Totura et al. 2009), mothers' and children's reports of being bullied during primary and secondary school overall yielded modest agreement. Percentages of agreement calculated for our study provided greater support of inter-rater reliability compared to kappa coefficients. Taking into account that kappa coefficients include the level of agreement between those who are, and are not identified as being bullied, it is plausible that mothers and children tend to disagree more so about who is not being bullied rather than who is.



Kappa coefficients in the present study were higher than those reported by other research assessing informants' agreement on victimization (Ronning et al. 2009; Wienke Totura et al. 2009). This may be attributable to the inclusion of teachers as informants in other studies. When assessing the agreement between children's and teachers' reports of victimization, a kappa coefficient of 0.12 has been reported (Wienke Totura et al. 2009). Similarly, kappa coefficients ranging between 0.11 and 0.22 have been reported when testing for the agreement between parents, teachers and child informants. Based on these findings, it is possible that when assessing bullying during childhood, mothers provide more reliable information compared to teachers. This is further supported by previous observations that children are more likely to report bullying experiences to someone at home than to their teachers (Whitney and Smith 1993). However, as teachers' reports of victimization were not collected in this study, we could not verify this.

Although the agreement between mothers and children in this study is low, they have both been shown to be valid; therefore discrepancies between the informants are not likely to be due to an error in the conceptualization of bullying behaviors. Rather, it may reflect different information and perspectives specific to each informant. For example, mothers may be reporting more severe or apparent forms of victimization. Thus poor agreement is not necessarily a representation of poor reliability but could also indicate that each informant contributes unique information (Achenbach 2006).

Discrepancies between mothers' and children's reports in the current study were greatest for victimization during secondary school. This may indicate that children are increasingly less likely to report bullying experiences to adults as they get older. Parents may also be less aware of what is happening in their child's life as children become more independent. Including children as informants when they get older will be beneficial as the limitations associated with mothers' reports may become more prominent when children enter adolescence. It is equally important to include mothers as informants for young children as the limitations associated with using young children as informants may outweigh those of mothers.

Similar to previous studies, victims of bullying showed elevated levels of emotional and behavioral problems. Our study extends these findings by showing the results are consistent whether victimization was reported by mothers or children. The associations between behavioral problems and victimization, as reported by both mothers and children, did not significantly differ further emphasizing the comparability between the two informants. Discrepancies in effect sizes between mothers' and children's reports of victimization, mostly in primary school, may be explained by two factors. First, children's reports collected at age 12 may be biased by retrospective account of their bullying experiences when they were in primary school. Second, the slightly greater effect sizes observed when mother reports of victimization were used may be due to shared method variance, as mothers were informants of both victimization and emotional and behavioral problems. However, the associations using mothers' reports are unlikely to be spurious as significant associations were also found when using children's reports of victimization. Furthermore, we observed slight increases in our effect sizes when victimization was experienced during secondary school. This may be explained by the shorter period of time between the victimization

experiences and emotional and behavioral problems. Altogether, our findings indicate that previous results of mental health outcomes of bullied children are not likely to be informant specific and that previous results which were based on the same informants to report both victimization and the outcome could be slightly inflated.

We observed overall similar estimates of genetic and environmental influences on victimization in primary and secondary schools as reported by both mothers and children. This finding supports previous reports indicating substantial genetic influences on children's risk of being bullied (Ball et al, 2008) *and* further shows that this effect is not dependent on the informant. These results demonstrate that both informants' reports tap into the same construct and can therefore be considered as valid and reliable for future research on the etiology of victimization. The slight increase in common environmental influences for victimization during secondary school reported by mothers is somewhat surprising given children's growing independence at the start of the adolescent years. It is possible that twins are more likely to seek new environments with their co-twin during this transitional period between primary to secondary schools. Alternatively, it is possible that the fact mothers reported on both twins' experiences with victimization resulted in inflated estimates of common environmental influences.

### Limitations

Our study has a number of limitations which give rise to further avenues of research. First, our investigation into the validity and comparability of mothers and children as informants was conducted on reports of only one type of life stressor, bullying victimization. This raises the question whether our findings can be generalized to other forms of life stressors such as parental maltreatment or physical abuse. Second, our study only investigated the agreement between mothers and children. Further research is needed to investigate the agreement between other informants, including teachers and peers. In particular, as peers have often been used to collect reports of bullying behaviors via peer nomination methodology (Veenstra et al. 2007; Perren and Alsaker 2006; Brendgen et al. 2008), bullying research would benefit from validating peers as reliable informants. Third, our sample included twins. We did not collect information about twins' experiences of victimization from their co-twins. Our findings would have been strengthened by including co-twins' reports of bullying victimization. Fourth, our measure of victimization during primary school as reported by the child was retrospective. This may have influenced our findings when comparing informants' reports, as retrospective accounts may be biased by false or distorted memories and by the current emotional state of children.

### Implications

Whilst keeping these limitations in perspective, our findings have research and clinical implications. Although our findings support the comparability between mothers and children as informants of victimization, the absence of complete agreement between the two indicate that the use of one informant would result in an incomplete account of children's lives. Our work emphasizes the need for multiple informants for research and also in clinical settings. Research would benefit from further enhancing methodological and statistical techniques used to incorporate and optimize information from multiple informants. These techniques

include using mean scores, latent class factor analyses, or an 'either or' approach. To further include children's perspective in research and clinical interviews, developmentally appropriate measures that take into account limitations inherent to child self-reports are needed. The use of games or puppets such as the Berkeley Puppet Interview (BPI, Ablow et al. 1999) allows children to express themselves and report on behaviors in a developmentally sensitive manner. For mental health professionals and researchers, although the reliance on one informant alone does have limitations, our findings demonstrate that in the absence of one informant the other can be considered as a viable alternative. In situations where children are unavailable or struggle to report on their experiences, mothers can be considered as alternative sources of information, and vice versa.

## Acknowledgments

The E-Risk Study is funded by the Medical Research Council (MRC grant G9806489). Additional support was provided by funds from the Johan Jacobs Foundation, the British Academy, the Nuffield Foundation. Sania Shakoor is supported by the Medical Research Council. Louise Arseneault is supported by a Career Scientist Award from the Department of Health, UK. Lucy Bowes is supported by the Economic and Social Research Council. Avshalom Caspi is a Royal Society Wolfson Research Merit Award holder. Terrie E. Moffitt and Avshalom Caspi are supported by the Lady Davis fellowship of the Hebrew University and The Caselberg Trust.

We are grateful to the study mothers and fathers, the twins, and the twins' teachers for their participation. Our thanks to Michael Rutter and Robert Plomin, to Thomas Achenbach for kind permission to adapt the Child Behavior Checklist, and to members of the E-Risk team for their dedication, hard work, and insights.

## References

- Ablow JC, Measelle JR, Kraemer HC, Harrington R, Luby J, Smider N, et al. The MacArthur three-city outcome study: evaluating multi-informant measures of young children's symptomatology. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1999; 38:1580–1590. [PubMed: 10596259]
- Achenbach, TM. Manual for the child behaviour checklist/4–18 and 1991 Profile. Burlington: University of Vermont, Department of Psychiatry; 1991a.
- Achenbach, TM. Manual for the teacher's report form and 1991 profile. Burlington: University of Vermont, Department of Psychiatry; 1991b.
- Achenbach TM. As others see us: clinical and research implications of cross-informant correlations for psychopathology. *Current Directions in Psychological Science*. 2006; 15:94–98.
- Achenbach TM, McConaughy SH, Howell CT. Child/adolescent behavioural and emotional problems: implications of cross-informant correlations for situational specificity. *Psychological Bulletin*. 1987; 101:213–232. [PubMed: 3562706]
- Arseneault L, Walsh E, Trzesniewski K, Newcombe R, Caspi A, Moffitt TE. Bullying victimization uniquely contributes to adjustment problems in young children: a nationally representative cohort study. *Pediatrics*. 2006; 118:130–138. [PubMed: 16818558]
- Arseneault L, Bowes L, Shakoor S. Bullying victimization in youths and mental health problems: 'much ado about nothing'? *Psychological Medicine*. 2010; 40:717–729. [PubMed: 19785920]
- Arseneault L, Cannon M, Fisher HL, Polanczyk G, Moffitt TE, Caspi A. Childhood trauma and children's emerging psychotic symptoms: a genetically sensitive longitudinal cohort study. *The American Journal of Psychiatry*. 2011 in press.
- Ball HA, Arseneault L, Taylor A, Maughan B, Caspi A, Moffitt TE. Genetic and environmental influences on victims, bullies and bully-victims in childhood. *Journal of Child Psychology and Psychiatry*. 2008; 49:104–112. [PubMed: 18181884]
- Barker ED, Arseneault L, Brendgen M, Fontaine N, Maughan B. Joint development of bullying and victimization in adolescence: relations to delinquency and self-harm. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2008a; 47:1030–1038. [PubMed: 18665001]

- Barker ED, Boivin M, Brendgen M, Fontaine N, Arseneault L, Vitaro F, et al. Predictive validity and early predictors of peer-victimization trajectories in preschool. *Archives of General Psychiatry*. 2008b; 65:1185–1192. [PubMed: 18838635]
- Bird HR, Gould MS, Staghezza B. Aggregating data from multiple informants in child psychiatry epidemiologist research. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1992; 31:78–85.
- Bjorkqvist K, Lagerspetz KMJ, Kaukiainen A. Do girls manipulate and boys fight? Developmental trends in regard to direct and indirect aggression. *Aggressive Behavior*. 1992; 18:117–127.
- Bowes L, Arseneault L, Maughan B, Taylor A, Caspi A, Moffitt TE. School, neighborhood, and family factors are associated with children's bullying involvement: a nationally representative longitudinal study. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2009; 48:545–553. [PubMed: 19325496]
- Brendgen M, Boivin M, Vitaro F, Girard A, Dionne G, Perusse D. Gene-environment interaction between peer victimization and child aggression. *Development & Psychopathology*. 2008; 20:455–471. [PubMed: 18423089]
- Card NA, Stucky BD, Sawalani GM, Little TD. Direct and indirect aggression during childhood and adolescence: a meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development*. 2008; 79:1185–1229. [PubMed: 18826521]
- Craig W, Harel-Fisch Y, Fogel-Grinvald H, Dostaler S, Hetland J, Simons-Morton B, et al. A cross-national profile of bullying and victimization among adolescents in 40 countries. *International Journal of Public Health*. 2009; 54:216–224. [PubMed: 19623475]
- De Los RA, Kazdin AE. Informant discrepancies in the assessment of childhood psychopathology: a critical review, theoretical framework, and recommendations for further study. *Psychological Bulletin*. 2005; 131:483–509. [PubMed: 16060799]
- Egan SK, Perry DG. Does low self-regard invite victimization? *Developmental Psychology*. 1998; 34:299–309. [PubMed: 9541782]
- Gross D, Fogg L, Garvey C, Julion W. Behavior problems in young children: an analysis of cross-informant agreements and disagreements. *Research in Nursing and Health*. 2004; 27:413–425. [PubMed: 15514961]
- Herba CM, Ferdinand RF, Stijnen T, Veenstra R, Oldehinkel AJ, Ormel J, et al. Victimization and suicide ideation in the TRAILS study: specific vulnerabilities of victims. *Journal of Child Psychology & Psychiatry*. 2008; 49:867–876. [PubMed: 18492041]
- Kim YS, Koh YJ, Leventhal B. School bullying and suicidal risk in Korean middle school students. *Pediatrics*. 2005; 115:357–363. [PubMed: 15687445]
- Kim YS, Leventhal BL, Koh YJ, Hubbard A, Boyce WT. School bullying and youth violence: causes or consequences of psychopathologic behavior? *Archives of General Psychiatry*. 2006; 63:1035–1041. [PubMed: 16953006]
- Klomek AB, Sourander A, Niemela S, Kumpulainen K, Piha J, Tamminen T, et al. Childhood bullying behaviors as a risk for suicide attempts and completed suicides: a population-based birth cohort study. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2009; 48:254–261. [PubMed: 19169159]
- Ladd GW, Kochenderfer-Ladd B. Identifying victims of peer aggression from early to middle childhood: analysis of cross-informant data for concordance, estimation of relational adjustment, prevalence of victimization, and characteristics of identified victims. *Psychological Assessment*. 2002; 14:74–96. [PubMed: 11911051]
- Ladd GW, Troop-Gordon W. The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Development*. 2003; 74:1344–1367. [PubMed: 14552402]
- Measelle JR, Ablow JC, Cowan PA, Cowan CP. Assessing young children's views of their academic, social, and emotional lives: an evaluation of the self-perception scales of the Berkeley Puppets Interview. *Child Development*. 1998; 69:1556–1576. [PubMed: 9914640]
- Nansel TR, Craig W, Overpeck MD, Saluja G, Ruan WJ. Health Behaviour in School-Aged Children Bullying Analyses Working Group. Cross-national consistency in the relationship between

- bullying behaviors and psychosocial adjustment. *Archives of Pediatrics & Adolescent Medicine*. 2004; 158:730–736.
- Olweus, D. *Bullying at school*. Cambridge: Blackwell; 1993.
- Olweus D. Annotation: bullying at school: basic facts and effects of a school based intervention program. *Journal of Child Psychology and Psychiatry and Allied Disciplines*. 1994; 35:1171–1190.
- Olweus, D. *Understanding and researching bullying: Some critical issues*. New York: Routledge; 2009.
- Perren S, Alsaker FD. Social behavior and peer relationships of victims, bully-victims, and bullies in kindergarten. *Journal of Child Psychology and Psychiatry*. 2006; 41:45–57. [PubMed: 16405640]
- Piacentini JC, Cohen P, Cohen J. Combining discrepant diagnostic information from multiple sources: are complex algorithms better than simple ones? *Journal of Abnormal Child Psychology*. 1992; 20:51–63. [PubMed: 1548394]
- Plomin, R.; DeFries, J.C.; McClearn, G.E.; McGuffin, P. *Behavioral genetics*. 4th ed.. New York: Worth; 2001.
- Price TS, Freeman B, Craig I, Petrill SA, Ebersole L, Plomin R. Infant zygosity can be assigned by parental report questionnaire data. *Twin Research*. 2000; 3:129–133. [PubMed: 11035484]
- Rey JM, Schrader E, Morris-Yates A. Parent-child agreement on children's behaviours reported by the child behaviour checklist (CBCL). *Journal of Adolescence*. 1992; 15:219–230. [PubMed: 1447409]
- Rivers I, Smith PK. Types of bullying behavior and their correlates. *Aggressive Behavior*. 1994; 20:359–368.
- Ronning JA, Sourander A, Kumpulainen K, Tamminen T, Niemela S, Moilanen I, et al. Cross-informant agreement about bullying and victimization among eight-year-olds: whose information best predicts psychiatric caseness 10–15 years later? *Social Psychiatry and Psychiatric Epidemiology*. 2009; 44:15–22. [PubMed: 18604618]
- Scholte RH, Engels RC, Overbeek G, de Kemp RA, Haselager GJ. Stability in bullying and victimization and its association with social adjustment in childhood and adolescence. *Journal of Abnormal Child Psychology*. 2007; 35:217–228. [PubMed: 17295065]
- Schreier A, Wolke D, Thomas K, Horwood J, Hollis C, Gunnell D, et al. Prospective study of peer victimization in childhood and psychotic symptoms in a nonclinical population at age 12 years. *Archives of General Psychiatry*. 2009; 66:527–536. [PubMed: 19414712]
- Sourander A, Helstela L, Helenius H. Parent-adolescent agreement on emotional and behavioural problems. *Social Psychiatry and Psychiatric Epidemiology*. 1999; 34:657–663. [PubMed: 10703276]
- Sourander A, Jensen P, Ronning JA, Niemela S, Helenius H, Sillanmaki L, et al. What is the early adulthood outcome of boys who bully or are bullied in childhood? The Finnish “from a boy to a man” study. *Pediatrics*. 2007; 120:397–404. [PubMed: 17671067]
- STATA. Version 9.0. Manuals. Stata Corporation. College Station: STATA; 2005.
- Trouton A, Spinath FM, Plomin R. Twins early development study (TEDS): a multivariate, longitudinal genetic investigation of language, cognition and behavior problems in childhood. *Twin Research*. 2002; 5:444–448. [PubMed: 12537874]
- Veenstra R, Lindenberg S, Zijlstra BJ, De Winter AF, Verhulst FC, Ormel J. The dyadic nature of bullying and victimization: testing a dual-perspective theory. *Child Development*. 2007; 78:1843–1854. [PubMed: 17988325]
- Whitney I, Smith PK. A survey of the nature and extent of bullying in junior/middle and secondary schools. *Education Research*. 1993; 35:3–25.
- Wienke Totura CM, Green AE, Karver MS, Gesten EL. Multiple informants in the assessment of psychological, behavioral, and academic correlates of bullying and victimization in middle school. *Journal of Adolescence*. 2009; 32:193–211. [PubMed: 18801565]
- Williams RL. A note on robust variance estimation for cluster correlated data. *Biometrics*. 2000; 56:645–646. [PubMed: 10877330]

Wolke D, Woods S, Bloomfield L, Karstadt L. The association between direct and relational bullying and behaviour problems among primary school children. *Journal of Child Psychology and Psychiatry*. 2000; 41:989–1002. [PubMed: 11099116]

**Table 1**

Agreement between mothers' and children's reports of bullying victimization

	<b>Informant</b>	<b>N (%) children</b>	<b>Agreed by other informant %</b>	<b>Kappa coefficient (k)</b>
Bullied in				
Primary	Mothers	956 (43%)	52%	0.20**
school	Children	871 (41%)	56%	
Secondary	Mothers	772 (36%)	45%	0.29**
school	Children	578 (27%)	60%	

\*\*  
 $p < 0.01$

Table 2

Standardized scores or mothers' and teachers' combined rating of children's emotional and behavioral problems at age 12 for bullied and non-bullied children

Bullied in	Informant	Non-bullied		Bullied		Effect size (d)
		Mean (SD)	Mean (SD)	Mean (SD)	(95%CI)	
Primary school						
Age 12 problems						
Emotional	Mothers	0.17 (0.87)	0.22 (1.11)	0.39 (0.30, 0.48)	0.39	
	Children	0.07 (0.93)	0.10 (1.09)	0.17 (0.08, 0.27)	0.17	
Behavioral	Mothers	0.12 (0.90)	0.15 (1.10)	0.23 (0.14, 0.33)	0.27	
	Children	0.06 (0.95)	0.09 (1.07)	0.15 (0.05, 0.24)	0.15	
Secondary school						
Age 12 problems						
Emotional	Mothers	0.21 (0.84)	0.37 (1.14)	0.57 (0.47, 0.68)	0.57	
	Children	0.11 (0.91)	0.30 (1.16)	0.41 (0.30, 0.53)	0.42	
Behavioral	Mothers	0.15 (0.88)	0.26 (1.14)	0.39 (0.29, 0.50)	0.41	
	Children	0.10 (0.92)	0.27 (1.14)	0.34 (0.22, 0.45)	0.38	

All analyses were controlled for children's gender

No interaction effect was observed between victimization and children's gender



**Table 3**  
Genetic and environmental influences on bullying victimization according to mothers and children

Bullied in	Zygosity		Etiological influences		
	MZ Correlation r (n pairs)	DZ Correlation r (n pairs)	Genetic	Common environment	Unique environment
Primary school					
Mother	0.69 (596)	0.42 (578)	0.54	0.15	0.31
Child	0.57 (504)	0.41 (486)	0.32	0.25	0.43
Secondary school					
Mother	0.79 (581)	0.55 (578)	0.47	0.32	0.21
Child	0.66 (490)	0.46 (486)	0.40	0.26	0.34

Estimates for etiological influences were calculated using Falconer's equation