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Self-perception but not peer reputation of bullying victimization is associated with non-clinical psychotic experiences in adolescents

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Background. Bullying victimization may be linked to psychosis but only self-report measures of victimization have been used so far. This study aimed (a) to investigate the differential associations of peer-nominated *versus* self-reported victim status with non-clinical psychotic experiences in a sample of young adolescents, and (b) to examine whether different types of self-reported victimization predict non-clinical psychotic experiences in these adolescents.

Method. A combination of standard self-report and peer nomination procedures was used to assess victimization. The sample ($n=724$) was divided into four groups (exclusively self-reported victims, self- and peer-reported victims, exclusively peer-reported victims, and non-victims) to test for a group effect on non-clinical psychotic experiences. The relationship between types of victimization and non-clinical psychotic experiences was examined by a regression analysis.

Results. Self-reported victims, along with self- and peer-reported victims, scored higher than peer-reported victims and non-victims on non-clinical psychotic experiences. Self-reports of direct relational, indirect relational and physical victimization significantly improved the prediction of non-clinical psychotic experiences whereas verbal and possession-directed victimization had no significant predictive value.

Conclusions. The relationship between victimization and non-clinical psychotic experiences is only present for self-reported victimization, possibly indicative of an interpretation bias. The observed discrepancy between self-report and peer-report highlights the importance of implementing a combination of both measures for future research.

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Key words: Adolescents, bullying victimization, peer nomination, psychosis, self-report.

Introduction

Several studies have demonstrated a link between bullying victimization and subclinical or clinical psychotic symptoms (Lataster *et al.* 2006; Campbell & Morrison, 2007; Kelleher *et al.* 2008; Schreier *et al.* 2009). This is in accordance with a large body of evidence describing the adverse effects of being victimized on mental health problems, such as depression and anxiety (Hawker & Boulton, 2000), and self-harm behaviors and suicidal ideations (Barker *et al.* 2008; Herba *et al.* 2008; Klomek *et al.* 2009; Reijntjes *et al.* 2010). This has highlighted victimization as a major social risk factor that, through its putative effect on

cognitive and biological processes, may induce a lasting psychological vulnerability (Arseneault *et al.* 2010).

However, to date, all studies investigating the association with psychosis have used self-report measures of bullying victimization. This is problematic for two reasons. First, self-report potentially introduces biases because of the subjective quality of the appraisal of bullying. As the presence of psychotic experiences may plausibly impact on this subjective appraisal, there is a risk of over-reporting of victimization. Longitudinal and prospective studies (Poulton *et al.* 2000; Schreier *et al.* 2009) have been partly able to counter this bias by showing that the victimization experiences preceded the psychotic symptoms. Nevertheless, it cannot be excluded that subtle alterations associated with the vulnerability for psychosis lead to over-reporting of victimization experiences, even before the onset of the psychotic experiences. Second, if victimization and psychosis outcome are both based on self-reports, a spurious correlation may

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arise due to common method variance. Such a correlation may be partly due to the same assessment method being used, thereby overestimating the real relationship between victimization and psychosis.

Elsewhere we have argued that it is essential to include methods using peer reports in studies investigating the adverse effects of victimization (Gromann *et al.* 2011). The advantage of peer reports is that they are based on a considerable number of observers who are familiar with and present in a given environment (Atlas & Pepler, 1998). In addition, although self-reports may be colored by a possible pre-existing psychotic vulnerability, this risk is absent in peer reports. This does not fully exclude the risk of over-reporting in peer reports, as these may be influenced by a tendency to report as victims the children who behave oddly, but peer report is plausibly less susceptible to this risk than self-report. Although both peer nomination and self-report have been established as valid methods (Pellegrini, 2001; Olweus, 2010), it is important to realize that they tap different constructs: self-report measures individual perception and peer nominations measure group perceptions (Juvonen *et al.* 2001). Thus, peer reports are suitable for investigating the reputation of a child whereas self-reports are useful for investigating the way children view themselves in a given environment. Peer-reported victimization has been associated with more rejection and less acceptance in the group (Juvonen *et al.* 2001). In turn, social exclusion has been linked to mental health problems in general (Huxley & Thornicroft, 2003) and psychosis specifically (Wicks *et al.* 2005). Self-reported victimization, however, has been associated with self-reported adjustment outcomes such as depressed mood, anxiety, loneliness and negative self-views (Juvonen *et al.* 2001). Comparing self-reports and peer reports of victim status may thus yield essential information, especially with regard to their putative impact on the development of psychotic experiences.

The purpose of this study was to investigate the relationship between bullying victimization as assessed with self-reports and peer reports on the one hand and non-clinical psychotic experiences in a general population sample of young adolescents on the other. The general population approach has proven useful because it allows investigation of the mechanisms of psychosis at the non-clinical level, where the expression of the phenotype is much more common than at the level of the clinical disorder (Johns & van Os, 2001). Many previous studies have supported this approach, providing evidence for longitudinal continuity (Poulton *et al.* 2000; Schreier *et al.* 2009), shared risk factors (van Os *et al.* 2003, 2004; Cougnard *et al.* 2007), shared demographic

characteristics (Binbay *et al.* 2011), symptom dimensions (Stefanis *et al.* 2002; Krabbendam *et al.* 2004) and neuropsychological correlates (Krabbendam *et al.* 2005; Simons *et al.* 2007). To assess victimization, we used standard self-report and peer-report measures of victimization. Subsequently, we divided the sample into four subgroups to examine their link to non-clinical psychotic experiences: exclusively self-reported victims, exclusively peer-reported victims, victims according to both self-reports and peer reports, and non-victims.

Considering the established link between self-reported victimization and psychosis, all self-reported victim groups should differ from the non-victims. However, assuming that this relationship is due to an interpretation bias, peer reports should not be associated with non-clinical psychotic experiences. Specifically, we expected both exclusively self-reported victims and victims according to both self- and peer reports to report more psychotic experiences than the exclusively peer-reported victims and non-victims. Our secondary aim was to disentangle the relationship between self-reported victimization and psychosis by investigating whether the main types of self-reported victimization (i.e. physical, possession-directed, verbal, direct relational and indirect relational) differentially predict non-clinical psychotic experiences. Examining whether different types of self-reported victimization influence psychosis differently may further our understanding of the risk-increasing effect of bullying and may inform possible interventions.

Method

Subjects

In total, 818 children were asked to participate in this study. Of these, 19 children did not get parental permission to participate, 22 children were not present at the time of data collection due to illness, 17 did not complete the questionnaires, and 36 could not be classified into one of the bullying roles. Specifically, those 36 subjects received the same scores for multiple and incompatible roles (e.g. bully and outsider) and therefore could not be classified to one role. This left us with 724 children: 374 boys (51.7%) and 350 girls (48.3%). There was no significant difference in terms of age between boys and girls ($F=0.006$, $p>0.9$). The mean age was 11.9 years (s.d.=0.76, range 10–14 years); 684 subjects (94.5%) were born in The Netherlands.

Procedure

The data collection took place in April and May 2010. Subjects were recruited in collaboration with their

primary schools. In total, 17 primary schools participated, from different villages and cities in The Netherlands. The children were tested at their own schools. At least two research assistants were present during every experimental session. The parents of all children received a consent letter in which the aims and procedures of the study were described. They could return an attached objection note if they did not want their child to participate. Children themselves were also given the opportunity to decline participation, but none did. At the beginning of the session, children were informed that all data would be treated confidentially and that their names would be removed in the dataset. On average, the testing took 30 min for each subject.

Assessment

Non-clinical psychotic experiences

Non-clinical psychotic experiences were assessed by four yes/no questions: (1) 'Some children believe in mind reading or being psychic. Have other people ever read your mind?'; (2) 'Have you ever had messages sent just to you through radio or TV?'; (3) 'Have you ever thought that people are following you or spying on you?'; and (4) 'Have you ever heard voices other people cannot hear?' These questions were obtained from the Diagnostic Interview Schedule for Children (DISC-C), which is a widely used structured diagnostic instrument aimed at discovering more than 30 different disorders in children and adolescents (Shaffer *et al.* 2000). The validity and reliability of the DISC-C has been established, indicating that it is a suitable tool for diagnosing children and adolescents. For this study, the four questions tapping psychosis were translated into Dutch. Previous research has shown their high validity in terms of predicting adult psychotic disorder (Poulton *et al.* 2000) and assessing psychotic experiences in children (Lataster *et al.* 2006). All answers to the psychosis questions were combined into one continuous psychosis outcome measure.

Peer reputation of victim status

The Bullying Role Nomination Procedure (BRNP), a standard peer-nomination procedure, was used to determine the victims in the class. Previous research has established the validity of this nomination procedure (Goossens *et al.* 2006). Further details of the procedure can be found elsewhere (Olthof *et al.* 2011). Two questions were asked to obtain victim *versus* bully nominations: (a) 'Do you know anyone in your classroom who is being victimized in this particular way? If so, could you give us the name(s)?' and (b) 'Do you know which classmates carry out that

particular form of bullying?' To obtain a general measure for peer nomination of victim status, continuous scores were computed for each class by dividing the number of received nominations by the number of nominators (i.e. children who participated in the nomination procedure and were asked to nominate other children, excluding themselves, for bullying roles). Children were assigned the role of victim if their victim nomination score was at least 0.1 and exceeded all other bullying role scores (i.e. ringleader bully, assistant, reinforcer, outsider, and defender) by at least 0.01. All other children were classified as non-victims. Hence, the non-victims consisted of all other bullying roles and all non-involved children (i.e. the remaining children who were not involved in bullying).

Self-perception of victim status

The self-perception of being victimized was measured by means of the Revised Olweus Bullying Questionnaire (Olweus, 1996), which is a standard self-report procedure. First, children received a definition of bullying. We used the general question 'How many times have you been the victim of bullying in the past three months?' as an index of self-perceived victim status. Five additional items were used to assess the different forms of bullying victimization: (1) 'How many times in the past three months did it happen that you were sworn at, laughed at or ridiculed at school?' (i.e. verbal); (2) 'How many times in the past three months did it happen that classmates did not allow you to participate in group activities even though you wanted to?' (i.e. direct relational); (3) 'How many times in the past three months did it happen at school that you were kicked, hit, pushed, or intentionally hurt in a different way?' (i.e. physical); (4) 'How many times in the past three months did it happen that classmates told lies or annoying things about you?' (i.e. indirect relational); and (5) 'How many times in the past three months did it happen that something was stolen from you, hidden or destroyed on purpose?' (i.e. possession-directed). In line with previous research (Olweus, 2010), we used a cut-off score of 3 or higher: thus, whenever subjects reported incidents of victimization occurring two or three times a month (i.e. score 3), once a week (i.e. score 4) or several times a week (i.e. score 5), they were classified as self-reported victims.

Statistical analyses

SPSS version 17 (SPSS Inc., USA) was used to analyze the results. First, all cases were selected and recoded into one group variable, consisting of the following four subgroups: exclusively self-reported victims

(only victims on the basis of their self-reports), both self- and peer-reported victims (self-reports and peer reports in agreement), exclusively peer-reported victims (only identified as victims on the basis of peer reports), and non-victims. The continuous psychosis variable was transformed into normalized scores, using Rankit's procedure. This standard SPSS method uses the formula $(r - 1/2)/w$, with w equaling the number of observations and r being the rank, ranging from 1 to w . An ANOVA was performed with group (four types of victimization) as the independent variable and the normalized psychosis outcome measure as the dependent variable. *Post-hoc* pairwise comparisons were corrected for multiple comparisons (i.e. Bonferroni correction). Subsequently, a linear regression analysis was conducted to examine the relationship between different victimization types and psychosis, with the different types of self-reported bullying (i.e. physical, possession-directed, verbal, direct relational and indirect relational) as predictors and the continuous psychosis outcome measure as the dependent variable. All analyses were controlled for gender and age. All statistical tests were evaluated at a significance level of $\alpha = 0.05$.

Results

Frequencies

The sample consisted of 79 exclusively self-reported victims (10.9%), 33 exclusively peer-reported victims (4.6%), 37 both self- and peer-reported victims (5.1%) and 575 non-victims (79.4%). Table 1 depicts the frequencies of each type of self-reported bullying victimization.

In total, 303 subjects (41.9%) answered 'no' to all four psychosis questions, indicating that they had no psychotic-like experience at all, and 421 subjects (58.1%) reported at least one psychotic-like experience. Out of those, 200 subjects (27.6%) reported at least two psychotic-like experiences, 68 subjects (9.4%) reported at least three experiences, and eight subjects (1.1%) answered 'yes' to all four psychosis questions.

Is there a group effect on the psychosis outcome measure?

There was a significant effect of group on non-clinical psychotic experiences ($F = 11.14$, $p < 0.0001$). *Post-hoc* pairwise comparisons (Table 2, Fig. 1) showed that self-reported victims scored significantly higher than peer-reported victims and higher than the 'non-victims' subgroup. Both self- and peer-reported victims scored significantly higher than 'non-victims'. There were no significant differences

Table 1. Frequencies and percentages for each type of self-reported victimization

Type of victimization	Frequency	Percentage of total sample
Verbal	103	14.2
Indirect relational	91	12.6
Relational	53	7.3
Physical	52	7.2
Possession-directed	26	3.6

between self-reported victims and both self- and peer-reported victims. Peer-reported victims did not differ significantly from non-victims or both self- and peer-reported victims.

Is there a relationship between the different types of self-reported victimization and the psychosis outcome measure?

The model with the self-reported victimization types (i.e. physical, possession-directed, verbal, direct relational, and indirect relational) explained a significant proportion of variance in non-clinical psychotic experiences ($\Delta R^2 = 0.089$, $F = 10.91$, $p < 0.001$). Direct relational victimization significantly predicted psychosis scores ($\beta = 0.08$, $t = 1.98$, $p < 0.05$), as did indirect relational victimization ($\beta = 0.16$, $t = 3.53$, $p < 0.001$) and physical victimization ($\beta = 0.12$, $t = 3.11$, $p < 0.005$). The prediction of non-clinical psychotic experiences was not significantly improved by verbal victimization ($\beta = 0.06$, $t = 1.25$, $p > 0.2$) or by possession-directed victimization ($\beta = 0.02$, $t = -0.51$, $p > 0.5$).

Discussion

This study is the first to investigate the relationship between non-clinical psychotic experiences and both peer reports and self-reports of victimization. The results show that peer-reported victimization is not associated with a higher frequency of non-clinical psychotic experiences. By contrast, there was a strong link between self-reported victimization and non-clinical psychotic experiences. The risk-increasing effect of victimization was related exclusively to the subjective appraisal of victimization experiences. The lack of an association between peer reports and non-clinical psychotic experiences further suggests that children who report psychotic-like experiences do not have an increased risk to become nominated as a victim by their peers. Given that children are not considered victims because they act differently due to their psychotic-like experiences, the concept of

Table 2. Test statistics for the pairwise comparisons between the four subgroups

	Mean difference	S.E.	<i>p</i> value	95% CI
Self-reported <i>v.</i> non-victims	0.50 ^a	0.10	0.001	0.234 to 0.761
Self-reported <i>v.</i> peer-reported victims	0.47 ^a	0.17	0.007	0.008 to 0.931
Self-reported <i>v.</i> both self- and peer-reported victims	0.03	0.17	0.846	−0.405 to 0.469
Both self- and peer-reported victims <i>v.</i> non-victims	0.47 ^a	0.14	0.001	0.093 to 0.838
Both self- and peer-reported victims <i>v.</i> peer-reported victims	0.44	0.20	0.030	−0.093 to 0.969
Peer-reported victims <i>v.</i> non-victims	0.03	0.15	0.853	−0.372 to 0.428

S.E., Standard error; CI, confidence interval.

^a Significant at an adjusted α of 0.01 after Bonferroni correction.

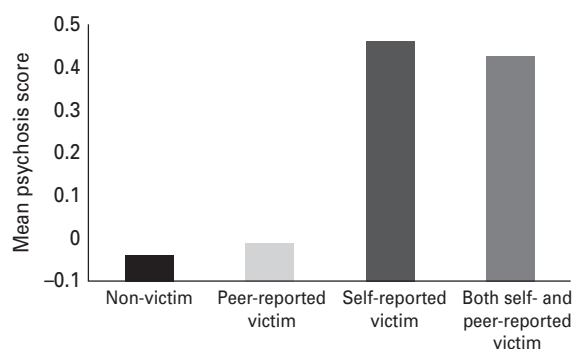


Fig. 1. The mean distribution of the psychosis outcome score for each subgroup.

reverse causality may not apply here. These findings underscore the relevance of the use of peer reports in addition to self-reports of victimization.

The finding that self-reported victimization is related to the risk for psychotic-like experiences is in line with previous research (Lataster *et al.* 2006; Schreier *et al.* 2009), supporting the validity of our study. Our results add to this by showing that the different types of self-reported victimization have different associations with psychosis: significant associations were found with direct relational, indirect relational and physical victimization but not with verbal or possession-directed victimization. The link of both direct and indirect relational victimization with psychotic-like experiences is plausible, given the social nature of the core features of psychosis, such as social withdrawal and paranoia, and suggests that social processes also play a role in the development of non-clinical psychotic experiences. Considering the more subjective social nature of indirect relational victimization, this finding highlights the idea that the individual interpretation may play a role in the association between self-reported victimization and psychotic experiences. Physical victimization, however, is one of the more direct and observable victimization types,

and thus less likely to be missed by peer reports. However, even physical interactions may be prone to different interpretations.

The association between self-reported victimization and psychotic-like experiences can be explained by two mechanisms, which are not necessarily mutually exclusive. The first presupposes a causal role for victimization, through either cognitive or biological changes or both. The experience of social adversity in childhood may lead to negative cognitive schemas related to social humiliation, thereby creating a cognitive vulnerability that forms the basis for psychotic-like experiences (Birchwood *et al.* 2004). Biological models indicate that early trauma may result in long-term changes in the brain. The densities of dopamine receptors and subsequent dopamine release have been shown to rise due to stress-related dysregulation of the hypothalamic–pituitary–adrenal (HPA) axis (Walker & Di Forio, 1997). In turn, dopamine sensitization has been proposed as a major mediator for the expression of psychosis (Kapur, 2003).

The second mechanism assumes that self-reported victimization is due to an interpretation bias in children with a pre-existing psychosis vulnerability. Accordingly, reports of victimization are considered a consequence rather than a cause. The latter explanation has credibility because peer reports, arguably the more objective measures of victimization, were not associated with increased psychotic-like experiences in this study. However, several precautionary notes are relevant here. First, longitudinal and prospective data exist showing that victimization precedes the onset of psychotic-like experiences (Poulton *et al.* 2000; Schreier *et al.* 2009). Second, it has been argued that psychosis is associated more strongly with under- than over-reporting of victimization (Dill *et al.* 1991; Read, 1997), which goes against the explanation of self-reported victimization as a consequence of an interpretation bias. Third, peer reports rely on multiple observers and are likely to be less sensitive to subtle

signs of victimization. In this regard, it is important to consider that, in general, self-reported victim status was more frequent than peer-reported victim status, showing that children were more likely to perceive themselves as victims than their peers do. Although peer reports may seem more objective, they are also susceptible to bias. Considering that bullying sometimes occurs in private, relevant behaviors or gestures can be missed in some cases and some peer reports may be based on wrong or insufficient information. Hence, combining self-reports and peer reports allows us to examine a higher frequency of victims, supporting the importance of including both measures in the assessment of victimization.

The current findings are limited by a few methodological issues. First, a self-report measure based on four single questions was used to assess non-clinical psychotic experiences. This only allows for a limited, general assessment of psychosis, and precludes distinguishing in terms of symptom frequency or level of conviction. However, the psychosis questions have been derived from a standard clinical interview and the results are comparable to previous studies using a similar instrument (Poulton *et al.* 2000; Lataster *et al.* 2006). Second, the cross-sectional nature of the study precludes drawing any conclusions about causality. The need to disentangle the temporal order of victimization experiences and development of psychotic-like experiences in longitudinal studies has only become more relevant given the current finding that the association is limited to self-reported experiences of victimization. It has been shown that depressed children are at a higher risk of being bullied but they also show stronger symptoms after being bullied (Fekkes *et al.* 2006), suggesting that mental health problems can act both as a precursor and as a consequence of victimization. The question remains whether this also holds for psychosis.

In conclusion, the current findings suggest that the perception of being victimized is a sufficient condition for the presence of a higher rate of psychotic-like experiences. Peer-reported victimization status does not contribute to an increased frequency of psychotic-like experiences, either because self-reported victimization is due to an interpretation bias of children with a pre-existing psychosis vulnerability, or because the victimization experiences are too subtle or infrequent to be picked up by peer reports. Future studies on victimization and psychosis should refer to the current literature on assessment of victimization, which suggests that peer nominations and self-reports measure two different constructs: group *versus* individual perceptions (Juvonen *et al.* 2001). The important question is not which measure is superior, but rather which construct is the key to

understanding the association between victimization and psychosis.

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Declaration of Interest

None.

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