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Does peer victimization predict low self-esteem, or does low self-esteem predict peer victimization? Meta-analyses on longitudinal studies

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ABSTRACT

In the current study two meta-analyses are performed on longitudinal studies on peer victimization and self-esteem. The goal of these meta-analyses was to analyze whether a low self-esteem predicts future peer victimization, or whether peer victimization predicts future low self-esteem. The databases PsycINFO, MEDLINE, and ERIC were searched for relevant literature. Two authors independently went through the retrieved articles and found four doctoral dissertations and 14 peer reviewed articles eligible for inclusion in the meta-analysis. Articles were independently coded by two authors, with good interrater agreement. A total of 16,230 youth were included in the meta-analysis on peer victimization and self-esteem, and a total of 16,394 youth were included in the meta-analysis on self-esteem and peer victimization. Significant prospective pathways were found from peer victimization to self-esteem, and from self-esteem to peer victimization, which suggests that peer victimization and self-esteem are related in a transactional manner. Analyses suggested a negligible role of publication bias in the obtained results. Moderator analyses revealed that effect sizes were smaller for studies that used peer reports, and for studies that considered longer time-spans. The results of the current study suggest that peer victimization could have long lasting negative effects on self-esteem, but also point out that children may become victims because of low self-esteem.

Introduction

Peer victimization is related to a plethora of negative outcomes, as demonstrated in meta-analyses on concurrent (Gini & Pozzoli, 2009; Van Geel, Goemans, & Vedder, 2015; Van Geel, Vedder, & Tanilon, 2014) and prospective (Gini & Pozzoli, 2013; Reijntjes et al., 2011; Reijntjes, Kamphuis, Prinzie, & Telch, 2010; Ttofi, Farrington, & Lösel, 2012; Ttofi, Farrington, Lösel, & Loeber, 2011) studies. One often studied concept in relation to peer victimization is self-esteem, and a meta-analysis suggests significant relations between peer victimization and self-esteem (Hawker & Boulton, 2000). However, because this meta-analysis is based mostly on cross-sectional studies, it remains elusive whether it is peer victimization that causes low self-esteem, or whether low self-esteem 'invites' victimization. Theoretical mechanisms have been proposed for both prospective pathways. Adolescents who are victimized may develop lower self-esteem because victimization communicates a negative evaluation of the victim by peers, which may in turn be

internalized (Salmivalli, Kaukiainen, Kaistaniemi, & Lagerspetz, 1999). Alternatively, adolescents with low self-esteem have been argued to 'attract' victimization because they communicate that they will not defend themselves when harassed, or indeed fail to defend themselves when harassed, leading to increased chances of future victimization (Egan & Perry, 1998; Overbeek, Zeevalkink, Vermulst, & Scholte, 2010). One explanation need not exclude the other as victimization and self-esteem could be related in a cyclical fashion, reinforcing one another as proposed in transactional models (Boulton, Smith, & Cowie, 2010; Sameroff, 1987).

Though several longitudinal studies on the relation between victimization and self-esteem have been published, some studies found that low self-esteem puts children at risk for victimization but not that peer victimization predicts low self-esteem (Egan & Perry, 1998; Salmivalli & Isaacs, 2005), but others reported that peer victimization predicts low self-esteem, but not that low self-esteem invites victimization (Overbeek et al., 2010). Yet other articles have found evidence for a model, wherein peer victimization predicts self-esteem and vice-versa (Boulton et al., 2010; Houbre, Tarquinio, & Lanfranchi, 2010).

The search for moderators

As stated, longitudinal studies about peer victimization and self-esteem have provided different results. It is possible that these different results have emerged because of differences in the studies' designs or differences in the studied populations. In a meta-analysis it can be analyzed whether differences in effect sizes are related to study characteristics through moderator analyses. In the current study we focus on participant age, the use of peer reports or self-reports, and study length.

Recent meta-analyses on cross-sectional studies (Van Geel, Goemans, & Vedder, 2016; Van Geel, Toprak, Goemans, & Vedder, 2017) and a meta-analysis on the relation between peer victimization and depression later in life (Ttofi et al., 2011) suggest that adverse mental health outcomes of bullying are worse for younger than for older children. It is not clear why younger children would suffer more from peer victimization. It has been reported that peer victimization tends to be more prevalent in younger age groups (Pellegrini & Bartini, 2000; Scheithauer, Hayer, Petermann, & Jugert, 2006). To the extent that prevalence is not just indicative of the amount of victimization but also the severity and the time it prolongs, it could be argued that it impacts on the strength of the relationship between peer victimization and adverse health outcomes in younger children. At the same time, it has also been suggested that adolescents may be more susceptible to developing mental health problems as a result of peer victimization because adolescents place more importance on peers than younger children, making rejection by peers all the more painful (see for example Casper & Card, 2017).

With regards to peer and self-reports several meta-analyses have pointed out that effect sizes in studies about peer victimization tend to be stronger in studies using only self-reports (Hawker & Boulton, 2000; Van Geel et al., 2017). A likely explanation for these larger effect sizes is 'same-method variance', an inflated effect size because of the reliance on a single reporter for both risk factor and outcome (Hawker & Boulton, 2000). Same-method variance is in itself cause for concern because it may lead researchers and policy-makers to overestimate effect sizes between variables, but scholars in the field of peer victimization have warned against the unique reliance on self-reports also because bullies and victims may under-report their behavior and experiences out of shame or social desirability (Branson & Cornell 2009; Cornell & Brockenbrough, 2004). On the other hand, covert experiences of victimization may be more easily detected by self-reports (Gromann, Goossens, Olthof, Pronk, & Krabbendam, 2013), and it has been advised that both self- and peer reports should be considered in the study of peer victimization.

The length of longitudinal studies has not often been addressed as a moderator in meta-analyses on peer victimization, but one meta-analysis suggests that the link between peer victimization and depressive symptoms becomes weaker when more time passes (Ttofi et al., 2011). Although victimization can be relatively stable, children who were once victimized need not be victimized throughout their whole school experience (McDougall & Vaillancourt, 2015; Pouwels, Souren, Lansu, & Cillessen, 2016). Over longer periods past victims may cease being victims and have the chance to deal with their traumatic experiences. Nonetheless, peer victimization can have long lasting adverse mental health consequences, even up to forty years later (Kerr, Gini, & Capaldi, 2017; Takizawa, Maughan, & Arseneault, 2014), and it has even been argued that being victimized for some children becomes akin to a personality trait, being victimized for many years and across several contexts (McDougall & Vaillancourt, 2015). So though on average we may expect that adverse outcomes decrease with longer timespans, the question how long peer victimization remains harmful should remain a topic of investigation, and analyzing whether studies with longer timespans show weaker relations between peer victimization and self-esteem (and vice versa) might shed more light on this issue.

Current study

The goal of the current paper is to use meta-analyses to analyze the prospective relations from peer victimization to self-esteem, and from self-esteem to peer victimization. Using meta-analysis, the outcomes of several studies can be statistically combined to obtain an overall effect size. The incremental values of a meta-analysis beyond a statistical summary of effect sizes are that moderators affecting effect sizes can be statistically tested, and publication bias can be analyzed. Publication bias can emerge because journals may favor studies that report significant results. Studies that report non-significant results are less likely to be published and end up in the 'file drawers' of researchers. If this consistently happens, a relation between two variables might mistakenly be concluded because the existing null-findings have never been made available (Borenstein, Hedges, Higgins, & Rothstein, 2009). Though results have varied, several articles have provided support for significant longitudinal relations from peer victimization to self-esteem as well as from self-esteem to peer victimization (Boulton et al., 2010; Guerra, Williams, & Sadek, 2011; Leeuwis, Koot, Creemers, & Van Lier, 2015; Overbeek et al., 2010; Salmivalli & Isaacs, 2005). Based thereon, we hypothesize significant relations in both directions.
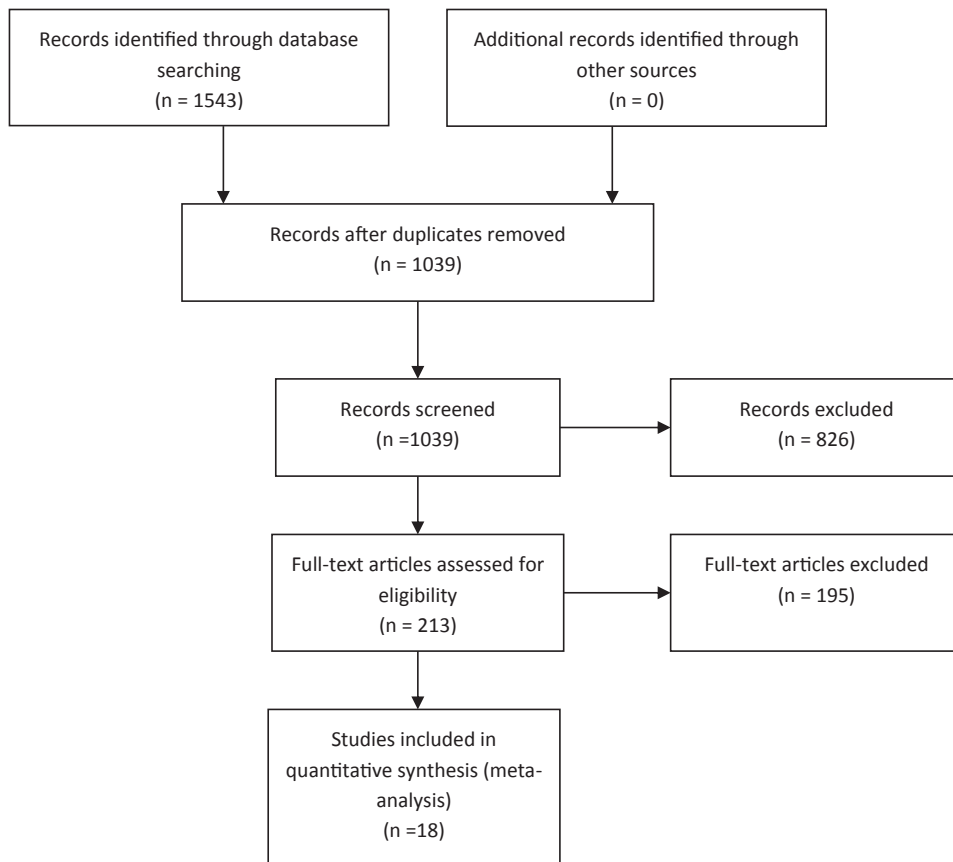
Fig. 1. A flow diagram of the search results.

In the current study we focus on age of the respondents, the type of measure used (self-reports versus peer reports), and study length as possible moderators. Because peer victimization tends to decline as children grow older (Pellegrini & Bartini, 2000; Scheithauer et al., 2006) we expect to find stronger links between self-esteem and peer victimization in studies that consider younger children. Due to same method variance, studies that use self-reports of peer victimization have been found to report higher effect sizes than studies that use peer reports (Hawker & Boulton, 2000). This leads us to expect larger effect sizes in studies that use self-reports. There is a lack of a well-developed body of literature on the recency of victimization incidents and mental health consequences, but we expect stronger prospective links between peer victimization and self-esteem in both directions for studies that consider shorter time-spans (Ttofi et al., 2011)

Method

The databases PsycINFO, MEDLINE, and ERIC were searched using the key words "bully*", "bullie*", "peer victim*", "peer harass*", or "school violence" in combination with "self-esteem", "self-concept", "self-confidence", "self-worth", "self-image", "self-assurance", or "self-perception" (September 19, 2015). A flow diagram of the search results is provided in Fig. 1. Our search strategy yielded 1039 studies. Reference lists of retrieved studies were scanned for further possible articles. Two authors independently went through all the references to find possible studies for inclusion. Studies had to include a prospective effect size, or enough information to compute an effect size between self-esteem and peer victimization to be included in the meta-analysis. We only focused on peer victimization, so that articles that focused on victimization by siblings or adults were excluded. Peer victimization is often defined as aggressive transactions between peers with a core element of bullying, but does not necessarily include power imbalance or repetition (Turner, Finkelhor, Shattuck, Hamby, & Mitchell, 2015). The effects of cyberbullying on psychological problems can be different from those of traditional peer victimization (cf., Van Geel et al., 2014) so that typically effect sizes on cyberbullying are meta-analyzed separately. Unfortunately, we found only two studies that provided effect sizes concerning cyberbullying (Modecki, Barner, & Vernon, 2013; Smokowski, Evans, & Cotter, 2014). These articles did not provide enough effect sizes for a separate meta-analysis, and did not report enough information to calculate an effect size, so that they were excluded from the meta-analyses. One article that included an item about cyberbullying among items about traditional peer victimization was included (Rueger, Malecki, & Demaray, 2011). To ensure comparability of the included studies, we decided to only focus on general, explicit self-esteem; this means that articles that focused on, for example, social self-esteem or academic self-concept, were excluded from the meta-analyses. Studies that

Table 1
Summary of the included studies and their characteristics.

Source	*N* (age/grade range)	Country (% female)	Victimization measure	Self esteem measure	Study length
Bogart et al. (2014)[a,b]	4297 (5th grade)	USA (51.1%)	Peer and self-reports	SPPC	60 months
Boulton et al. (2010)[a,b]	115 (9–10 y)	UK (44%)	Peer reports	SPPC	6 months
Egan and Perry (1998)[a,b]	189 (grade 3–7)	USA (42%)	Peer report	SPPC	5.5 months
Fanti and Henrich (2015)[a]	1416 (11–13 y)	Cyprus (51%)	Self-report	RSES	12 months
Guerra et al. (2011)[a,b]	2261 (grade 5–11)	USA (50%)	Self-report	RSES	12 months
Houbre et al. (2010)[a,b]	524 (8–12 y)	France (54%)	Self-report	SPPC	6 months
Leeuwis et al. (2015)[a,b]	330 (11 y)	Netherlands (53%)	Self-report	SPPC	12 months
Nishino et al. (2011)[a,b]	330 (grade 1)	Japan (52%)	Self-report	Six items based on Dubois et al., 1996 and Harter (1998)	24 months
Overbeek et al. (2010)[a,b]	774 (11–16)	Netherlands (52%)	Self-report	RSES	24 months
Rao (2013)[a,b,c]	1132 (5th–9th grade)	USA (49%)	Self-report	WAI-Ds	18 months
Reuger et al. (2011)[a,b]	863 (11–15 y)	USA (48%)	Self-report	BASC	6 months
Roeder et al. (2014)[a,b]	1242 (8–13 y)	USA (54%)	Peer report	SPPC	6 months
Romero (2007)[a,c]	210 (8th grade)	USA (44%)	Peer and self-report	SPPC	12 months
Salmivalli and Isaacs (2005)[a,b]	212 (11–13 y)	Finland (50%)	Peer report	RSES	12 months
Sapouna and Wolke (2013)[b]	3136 (12 y)	Scotland (52%)	Self-report	RSES	24 months
Stanley (2007)[a,b,c]	150 (9th and 10th grade)	USA (57%)	Self-report	SPPC	3 months
Wang (2011)[a,b,c]	1005 (10–16 y)	USA (53.2%)	Self-report	SDQ-I	12 months
Yang et al. (2013)[a]	1344 (10–11 y)	South Korea	Self-report	SEI	24 months

Note. SPPC = Self Perception Profile for Children (Harter, 1985); RSES = Rosenberg Self-Esteem Scale (Rosenberg, 1965); BASC = Behavior Assessment Scale for Children (Reynolds & Kamphaus, 2004); SDQ-I = Self Description Questionnaire I (Marsh, 1988); SEI = Self Esteem Inventory (Coopersmith, 1981). WAI-Ds = Weinberger Adjustment Inventory- Distress scale (Weinberger & Schwartz, 1990).

[a] Study included in the meta-analysis on the prospective link from self-esteem to peer victimization.
[b] Study included in the meta-analysis on the prospective link from peer victimization to self-esteem.
[c] Doctoral dissertation.

included participants aged 19 years or more were excluded. We wanted to focus our meta-analyses on community samples of children to generalize the results to a community sample of children, and thus studies that focused on clinical samples were excluded. There were not enough longitudinal studies on clinical samples to provide a meaningful basis for a separate meta-analysis. If multiple articles made use of the same dataset we only included the article using the largest sample in the meta-analysis, or the most recent one if the articles used the same number of respondents. Not only English studies were eligible for inclusion, manuscripts written in other languages were also eligible. Articles, book chapters and doctoral dissertations were all eligible for inclusion. All articles that met the inclusion criteria were written in English. These included 14 peer reviewed articles, and four doctoral dissertations. Included studies and their relevant characteristics are summarized in Table 1.

Coding

From all articles except one (Yang et al., 2013) we coded correlations as a measure of effect size. From the Yang et al. (2013) article we coded odds ratios, which were then transformed into correlations using the Comprehensive Meta-Analysis program (Borenstein, Hedges, Higgins, & Rothstein, 2005) prior to the analyses. If articles reported insufficient information to compute an effect size, authors were emailed with a request for extra information. This led to the inclusion of one article (Bogart et al., 2014). If articles reported multiple prospective waves (gaps between moments of measurement in a longitudinal study), these were averaged prior to inclusion in the analyses. So, for example, if prospective links between self-esteem and peer victimization were reported for T1 to T2, T1 to T3, and T2 to T3, these were averaged in the analyses. If articles reported on several forms of peer victimization (e.g., physical, relational, verbal) in relation to self-esteem, these were averaged prior to inclusion in the meta-analyses. If articles reported multiple independent effect sizes (for example boys and girls), these were entered in the meta-analyses separately. One article reported both implicit and explicit self-esteem (Leeuwis et al., 2015); Because all other included articles reported only explicit self-esteem, we chose to include only explicit self-esteem from this article. Articles were coded independently by two of the authors on effect size, sample size, and the moderators; mean age, peer reports versus self-reports, and study length. Differences were resolved through discussion. Prior to discussion, the rate of agreement was 90.4 percent.

Analyses

All analyses were performed with the Comprehensive Meta-Analysis 2.2 software (Borenstein et al., 2005). We analyzed the data using a random effects model: a fixed effect model would be appropriate if studies are believed to be functionally identical and means of studies only differ because of estimation error (Hedges & Vevea, 1998). The use of a fixed effect model precludes generalization to other populations. For most meta-analyses the fixed effects assumptions are implausible and thus the random effects model should be

used. In the random effects model, variation in effect sizes is incorporated in the weighing scheme and sources of variation can be studied using moderator analyses (Borenstein, Hedges, Higgins, & Rothstein, 2010; Card, 2012). To address potential sources of variation between included effect sizes, we ran moderator analyses on mean age of the respondents, peer reports versus self-reports, and study length. Several studies did not report a mean age, but many of these studies reported a narrow range of age or grades (e.g., 11–13 years). In such cases we used the median of the age range to prevent missing data. One study (Guerra et al., 2011) did not report a mean age and had a large age range; we decided to exclude this study from the moderator analysis on age. For the analysis on study length, we always included the largest time span for which an effect size was reported; if for example a study had four waves, we used the effect size between wave 1 and wave 4 in this moderator analysis. Two studies (Bogart et al., 2014; Wang, 2011), used both peer reports and self-reports; for the moderator analysis on peer reports vs self-reports we considered only the peer reports from these studies. Meta-regression was used to analyze mean age as a moderator, and a subgroup analysis was used to compare the effect sizes of studies using peer reports and studies using self-reports. We used a meta-regression, a subgroup-analysis, and a cumulative analysis to study the effects of study length.

To address the problem of publication bias we used Funnel plots, Orwin's Fail-safe N, Kendall's τ and the Duval and the Tweedie Trim and Fill method. Orwin's Fail-safe N estimates how many studies with non-significant results would be needed to reduce a meta-analytically obtained significant effect size to an effect size that has no practical significance. Using Kendall's τ we calculated the association between variances and standardized effect sizes. A significant Kendall's τ suggests that small studies with non-significant results tend not to be published, whereas a non-significant Kendall's τ suggests the absence of such publication bias. The Duval and Tweedie Trim and Fill method (Duval and Tweedie, 2000) imputes effect sizes until the error distribution closely approximates normality, to provide a more unbiased estimate of the effect size than the observed estimate (see Borenstein et al., 2009).

Results

Prospective pathway from peer victimization to self-esteem

A total of 15 studies were included in the meta-analysis on the pathway from peer victimization to self-esteem. These 15 studies reported 17 independent effect sizes. Sample sizes ranged from 115 respondents (Boulton et al., 2010) to 4297 respondents (Bogart et al., 2014), with a total of 16,230 respondents and an average of 955 respondents per included sample. Age ranged from 8 to 16 years. There were nine studies that used only self-reports, and four studies that used only peer reports and two studies that used a combination of peer and self-reports to measure peer victimization. A significant relation between peer victimization and self-esteem was found, with higher reports of peer victimization related to lower self-esteem ($r = -0.176$ [95% CI $= -0.216, -0.135$]). Effect sizes within this group of studies were heterogeneous ($I^2 = 82.631$, $Q (16) = 92.118$, $p < .001$). The results are summarized in Table 2. Orwin's Fail-safe N suggested that an additional 35 studies with non-significant results would need to be found to reduce the obtained effect size to a correlation coefficient of $r = 0.05$. Kendall's τ was -0.12 ($p = .25$). The Duval and Tweedie Trim and Fill method suggested that no studies needed to be imputed, and provided an unbiased estimate that was the same as the observed effect size. A funnel plot is included in Fig. 2. Taken together, the Funnel plot, Orwin's Fail-safe N, Kendall's τ and the Duval and Tweedie Trim and Fill method suggested the absence of publication bias. Using meta-regression, we found that the relation between peer victimization and self-esteem was not moderated by participant age ($B = 0.005$, $Q(1) = 0.370$, $p = .54$), but that it was significantly moderated by study length. Studies that considered longer time spans reported smaller effect sizes than studies with shorter time spans ($B = 0.002$, $Q(1) = 29.564$, $p < .001$). To further probe this effect we ran a comparison wherein we compared studies that considered timespans shorter than one year to timespans of one year or longer; we no longer found a statistically significant moderator effect for study length [$Q(1) = 0.285$, $p = .59$], and both studies considering timespans of shorter than one year $r = -0.180$ [95% CI $= -0.244, -0.115$] and longer than one year $r = -0.157$ [95% CI $= -0.214, -0.099$] reported significant relations between peer victimization and self-esteem. A cumulative meta-analysis suggested that the effect size stabilizes once studies lasting one year are entered in the analysis (see Fig. 4). When only studies lasting longer than one year have been entered, the overall effect size is smaller than when all studies are entered. The meta-regression, subgroup analysis and cumulative meta-analysis taken together suggest that there is an effect of study length, and that effect sizes tend to get smaller after one year. Finally, there was a statistically significant difference ($Q(1) = 7.939$, $p = .005$) between studies that used self-reports ($r = -0.200$ [95% CI $= -0.248, -0.151$]), and studies that used peer reports ($r = -0.116$ [95% CI $= -0.148, -0.084$]); effect sizes were smaller, though still significant, for studies that used peer reports.

Table 2
Outcomes of the meta analyses on the prospective links between self-esteem and peer victimization.

	No of studies	No of effect sizes	N	Correlation (95% CI)	Q	I^2	Orwin Fail safe N
PV → SE	15	17	16,230	−0.176 (−0.216, −0.135)[a]	92.118[a]	82.631	35
SE → PV	16	17	16,394	−0.159 (−0.214, −0.102)[a]	182.743[a]	91.245	27

Note. SE = self-esteem; PV = peer victimization.
[a] $p < .001$.

Funnel Plot of Standard Error by Fisher's Z
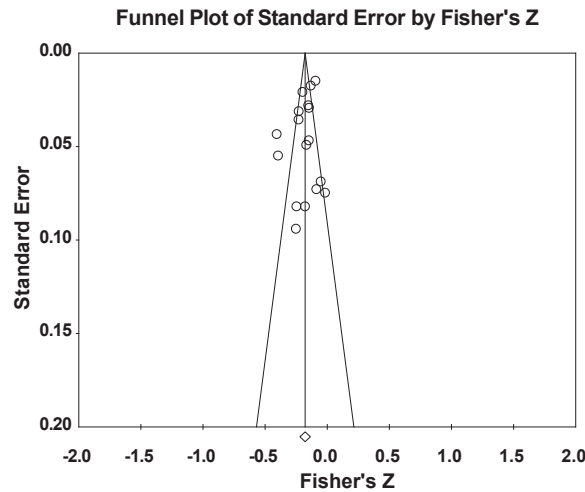
Fig. 2. Funnel plot for analyses on peer victimization and self-esteem.

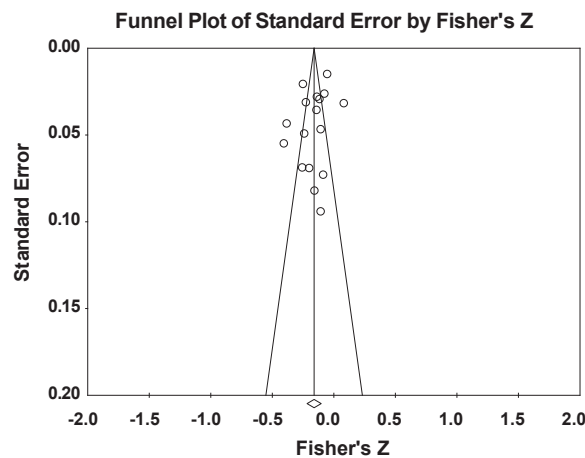## Funnel Plot of Standard Error by Fisher's Z

Fig. 3. Funnel plot for effect sizes between self-esteem and peer victimization.

Prospective pathway from self-esteem to peer victimization

A total of 16 studies were included in the meta-analysis on the pathway from self-esteem to peer victimization. These 16 studies reported 17 independent effect sizes. Sample sizes ranged from 115 respondents (Boulton et al., 2010) to 4297 respondents (Bogart et al., 2014), with a total of 16,394 respondents and an average of 964 respondents per included sample. Age ranged from 8 to 16 years. Eleven studies used only self-reports, four studies used only peer reports, and two studies used a combination of peer and self-reports to measure peer victimization. A significant relation between self-esteem and peer victimization was found, with lower self-esteem related to higher reports of peer victimization ($r = -0.159$ [95% CI = -0.214, -0.102]). Effect sizes within this group of studies were heterogeneous, ($I^2 = 91.245$, Q (16) = 182.743, $p < .001$). The results are summarized in Table 2. Orwin's Fail-safe N suggested that an additional 27 studies with non-significant results would need to be found to reduce the obtained effect size to a correlation coefficient of $r = 0.05$. Kendall's τ was -0.07 ($p = .36$). The Duval and Tweedie Trim and Fill method suggested that no studies needed to be imputed, and provided an unbiased estimate that was the same as the observed effect size. A funnel plot is included in Fig. 3. Taken together, the Funnel plot, Orwin's Fail-safe N, Kendall's τ and the Duval and Tweedie Trim and Fill method suggested the absence of publication bias. Using meta-regression, we found that the relation between self-esteem and peer victimization was not moderated by participant age ($B = -0.009$, $Q(1) = 0.993$, $p = .32$), but that it was significantly moderated by study length, with studies that considered longer time spans reporting smaller effect sizes than studies with shorter time spans ($B = 0.003$, $Q(1) = 68.701$, $p < .001$), which was statistically significant, though a small effect. To further probe this effect we ran a comparison wherein we compared studies that considered timespans shorter than one year to timespans of one year or longer; we no longer found a statistically significant moderator effect for study length [$Q(1) = 0.261$, $p = .61$], and both studies considering timespans of shorter than one year $r = -0.170$ [95% CI = -0.238, -0.101], and longer than one year $r = -0.142$ [95% CI = -0.224, -0.058], reported significant relations between peer victimization and self-esteem. A cumulative meta-analysis
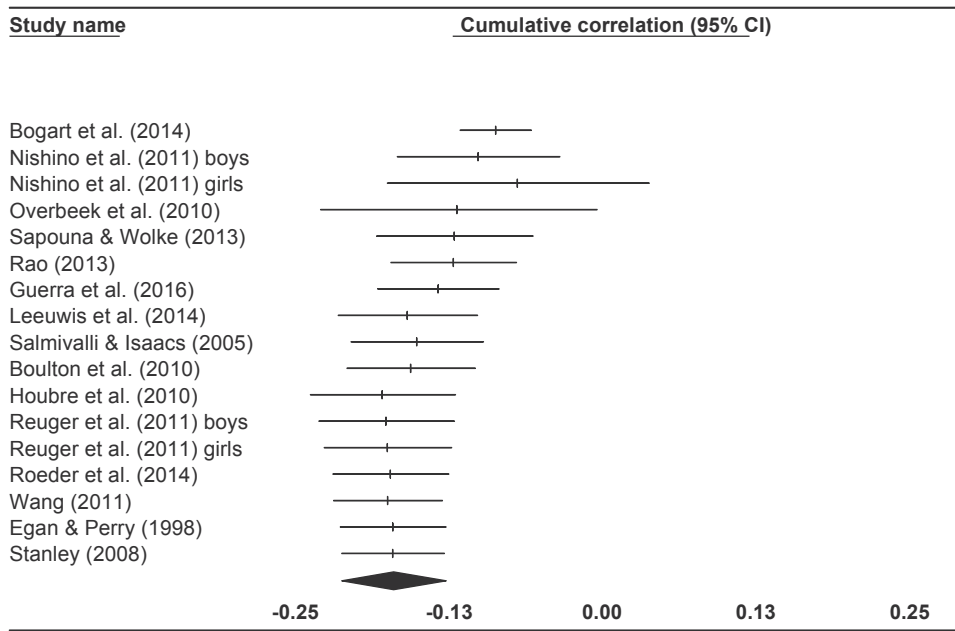
Fig. 4. A cumulative meta-analysis for the studies on the longitudinal relations between peer victimization and self-esteem. Studies with the longest time between waves were entered first.

suggested that the effect size stabilizes once studies lasting one year are entered in the analysis (see Fig. 5). When only studies lasting longer than one year have been entered, the overall effect size is smaller than when all studies are entered. The meta-regression, subgroup analysis and cumulative meta-analysis taken together suggest that there is an effect of study length, and that effect sizes tend to get smaller after one year. Regarding the type of measure, there was no significant difference between studies that used peer reports ($r = -0.109$ [95% CI $= -0.166, -0.051$]) and studies that used self-reports ($r = -0.174$ [95% CI $= -0.249, -0.096$]), $Q(1) = 1.737$, $p = .188$.
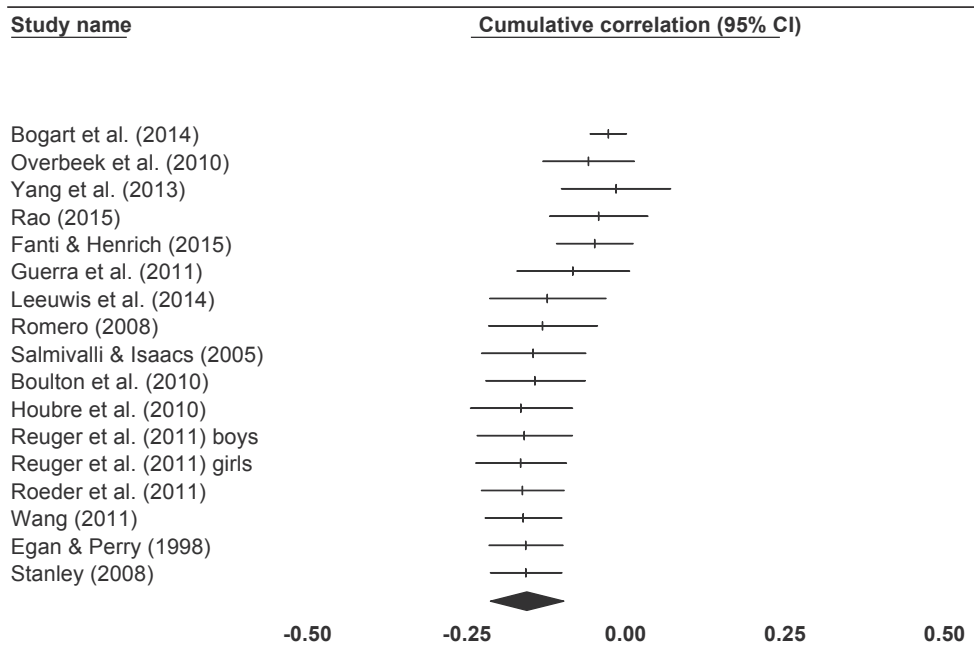

Fig. 5. A cumulative meta-analysis for the studies on the longitudinal relations between self-esteem and peer victimization. Studies with the longest time between waves were entered first.

Discussion

The purpose of the current study was to use meta-analyses to analyze the prospective relations between peer victimization and self-esteem and vice versa in children and adolescents. We found support for effects in both directions. Analyses on publication bias suggested that our findings are quite robust. Overall, the results of the meta-analyses support the idea of a transactional model (Sameroff, 1987) in the relation between peer victimization and self-esteem; peer victimization prospectively predicts lower self-esteem, and lower self-esteem also predicts future peer victimization. Those with lower self-esteem may 'attract' victimization because they communicate, verbally or non-verbally, that they will not defend themselves, or they may fail to defend themselves when victimized, thus increasing the likelihood of repeated victimization. Recent insights suggest that bullies tend to choose 'low-cost victims' with whom there is little chance of retaliation (Veenstra, Lindenberg, Munniksma, & Dijkstra, 2010; Volk, Dane, & Marini, 2014). This meta-analysis also confirms that peer victimization may lead to lower self-esteem, potentially because negative appraisals by peers become internalized (Overbeek et al., 2010; Salmivalli et al., 1999). Particularly worrisome is that the results of the current meta-analyses may be indicative of a negative cycle between self-esteem and peer victimization, wherein victimization lowers self-esteem, and wherein lowered self-esteem 'invites' new episodes of victimization.

Age was not found to be a significant moderator, which suggests that the prospective pathways from peer victimization to self-esteem and vice versa are roughly the same across age groups. However, this conclusion is tentative, because the included studies were restricted in the age ranges they represented; ages ranged only from 8 to 16, with only three studies considering children younger than 10 years old, and only two studies including sixteen year olds. Relatively many studies ($n = 7$) were limited in range from 10 to 13 year olds. Prospective studies with different age cohorts are needed to learn more about the interplay between self-esteem and peer victimization for younger and older children. Especially important would be prospective studies that start tracking these pathways early during development (e.g., in preschool years or early primary school years), when the effects of victimization on self-esteem or vice versa are likely to be at their onset.

Studies that used peer reports tended to report smaller effect sizes than studies that used self-reports to measure victimization in the pathways from peer victimization to self-esteem. We did not find a significant moderation effect for the pathway from self-esteem to peer reported victimization, though it should be noted that in this pathway the effect sizes for studies using self-reports were also smaller compared to the reverse pathway, yet still significant. It is likely that studies that have used only self-reports provide an overestimation of the effect size between peer victimization and self-esteem because of same-method variance (Hawker & Boulton, 2000). It should be noted that even though the effect sizes were smaller for studies using peer reports, they were still significant. This suggests that same method variance alone cannot explain significant longitudinal relations that have been found between self-esteem and peer victimization. It should also be noted that even though peer reports are important in the study of peer victimization, they are not a golden standard. Covert experiences of victimization may be more easily detected by self-reports (Gromann, et al., 2013). As such, this meta-analysis suggests to balance the advantage of using self-reports as a valid way of collecting information on victimization with the inflating effects of using self-reports only. Studies using multiple informants about victimization experiences would be preferable (e.g., Crick & Bigbee, 1998).

In line with our hypothesis, studies that considered longer time-spans reported smaller effect sizes. Mechanisms through which peer victimization hurts self-esteem (internalization), and through which children with low self-esteem become victims (easy victims) have been put forth, but we know little of the time spans these processes take. Results from our meta-regression analyses suggest that, on the one hand, the more recent the experience of peer victimization the lower the self-esteem, and the more recent the low self-esteem the higher the chances of peer victimization. However, once we compare effect sizes from studies that ran for one year or longer to effect sizes obtained within one year, we do not find significant differences. Both in studies that last longer and shorter than one year, young people who experience peer victimization report lower self-esteem, and both in studies that last longer and shorter than one year, young people with lower self-esteem have higher chances of experiencing child victimization. We had few studies lasting longer than one year, but a cumulative analysis wherein we entered longest studies first and shorter running studies later, confirmed that the longest studies tend to report the smallest effect sizes. These results are in line with a recent meta-analysis of Pouwels et al. (2016) who found that over the course of a year victimization is relatively stable, but for larger intervals stability decreases. Taken together, our analyses suggest that healing from peer victimization is possible, and escape from peer victimization is possible through improved self-esteem. However, our analyses also point out that healing and escaping are processes that would take at least a year, and the study with the longest timespan (Bogart et al., 2014) suggests that even after five years victims still have lower self-esteem. We would warn against interpreting the results from the current study with too much optimism though, because those who have experienced victimization report worse social, mental and physical health outcomes even decades later, than those who never experienced victimization (e.g., Copeland, Wolke, Angold, & Costello, 2013; Kerr et al., 2017; Takizawa et al., 2014). So while this meta-analysis shows that, with regard to self-esteem, neither victimization nor its damaging effects necessarily last forever, long lasting health consequences can certainly be the reality for some victims. Future research should address whether smaller effect sizes of time are related to an escape from victimization, or whether previous victims learn to cope with their victimization experiences or "get used" to victimization.

Several limitations should be kept in mind when interpreting the results of the current meta-analysis. Even though we analyzed prospective links between peer victimization and self-esteem in both directions, we should still be careful about cause and effect reasoning; statistical confounders may explain the relations between these variables. It was not possible to adjust for potential confounders in the current meta-analyses, because even when studies included covariates in their analyses, there were wide variations in the selection of covariates included. Another limitation is that we only considered general, explicit self-esteem. Results may be different if other indices are considered. For example, Leeuwis et al. (2015) found no relation between peer victimization and

implicit self-esteem in either direction, whereas the prospective relations between social self-esteem and peer victimization have been suggested to be even stronger than those between general self-esteem and peer victimization (Egan & Perry, 1998). Furthermore, we only found two longitudinal studies about cyberbullying so that we could not include cyberbullying in our meta-analysis. More longitudinal studies on cyberbullying and self-esteem are an important goal for future research. Longitudinal studies are very useful, but tend to be more scarce than cross-sectional studies. We found enough effect sizes to allow for two meaningful meta-analyses (see Borenstein et al., 2009, for a discussion about required studies and respondents in meta-analysis), and a total number of studies that was comparable to other longitudinal meta-analyses on peer victimization and problematic outcomes (Reijntjes et al., 2010, 2011), but the limited number of studies did mean that we were limited in the number of moderator analyses that we could consider.

Overall, there appear to be prospective relations between peer victimization and self-esteem in both directions. Based on the idea that victims lack self-esteem, assertiveness training has been suggested as a means to reduce victimization (e.g., Salmivalli, Karhunen, & Lagerspetz, 1996), and though support for this has been found (O'Moore & Minton, 2005), we would warn against providing single vulnerable children with assertiveness training because interventions focused on an individual as opposed to a whole classroom are unlikely to work (Fox & Boulton, 2003; Salmivalli, 2010). However, assertiveness training as part of a whole school intervention could be a valuable component of interventions, because this likely promotes defending behaviors among classmates (Gini, Albiero, Benelli, & Altoè, 2008), and may help vulnerable children with low self-esteem to speak up for themselves, potentially breaking the negative cycle between peer victimization and self-esteem.

References

References marked with an asterisk indicate studies included in the meta-analysis.

*Bogart, L. M., Elliott, M. N., Klein, D. J., Tortolero, S. R., Mrug, S., Peskin, M. F., ... Schuster, M. A. (2014). Peer victimization in fifth grade and health in tenth grade. *Pediatrics, 133*, 440–447.

Borenstein, M., Hedges, L.V., Higgins, J.P.T., Rothstein, H. (2005). Comprehensive meta-analysis version 2, http://www.meta-analysis.com.

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis.* Chichester, UK: John Wiley & Sons.

Borenstein, M., Hedges, L. V., Higgins, J., & Rothstein, H. R. (2010). A basic introduction to fixed-effect and random-effects models for meta-analysis. *Research Synthesis Methods, 1*, 97–111.

*Boulton, M. J., Smith, P. K., & Cowie, H. (2010). Short-term longitudinal relationships between children's peer victimization/bullying experiences and self-perceptions evidence for reciprocity. *School Psychology International, 31*, 296–311.

Branson, C. E., & Cornell, D. G. (2009). A comparison of self and peer reports in the assessment of middle school bullying. *Journal of Applied School Psychology, 25*, 5–27.

Card, N. A. (2012). *Applied meta-analysis for social science research.* New York: Guilford Press.

Casper, D. M., & Card, N. A. (2017). Overt and relational victimization: A meta-analytic review of their overlap and associations with social–psychological adjustment. *Child Development, 88*, 466–483.

Coopersmith, S. (1981). *Self-esteem inventories.* Palo Alto: Consulting Psychologists Press.

Copeland, W. E., Wolke, D., Angold, A., & Costello, E. J. (2013). Adult psychiatric outcomes of bullying and being bullied by peers in childhood and adolescence. *JAMA Psychiatry, 70*, 419–426.

Cornell, D. G., & Brockenbrough, K. (2004). Identification of bullies and victims: A comparison of methods. *Journal of School Violence, 3*, 63–87.

Crick, N. R., & Bigbee, M. A. (1998). Relational and overt forms of peer victimization: A multi-informant approach. *Journal of Consulting and Clinical Psychology, 66*, 337–347.

Duval, S., & Tweedie, R. (2000). Trim and fill: A simple funnel-plot-based method of testing and adjusting for publication bias in meta-analysis. *Biometrics, 56*, 455–463.

*Egan, S. K., & Perry, D. G. (1998). Does low self-regard invite victimization? *Developmental Psychology, 34*, 299–309.

*Fanti, K. A., & Henrich, C. C. (2015). Effects of self-esteem and narcissism on bullying and victimization during early adolescence. *The Journal of Early Adolescence, 35*, 5–29.

Fox, C. L., & Boulton, M. J. (2003). A social skills training (SST) programme for victims of bullying. *Pastoral Care in Education, 21*, 19–26.

Gini, G., & Pozzoli, T. (2009). Association between bullying and psychosomatic problems: A meta-analysis. *Pediatrics, 123*, 1059–1065.

Gini, G., & Pozzoli, T. (2013). Bullied children and psychosomatic problems: A meta-analysis. *Pediatrics, 132*, 720–729.

Gini, G., Albiero, P., Benelli, B., & Altoè, G. (2008). Determinants of adolescents' active defending and passive bystanding behavior in bullying. *Journal of Adolescence, 31*, 93–105.

Gromann, P. M., Goossens, F. A., Olthof, T., Pronk, J., & Krabbendam, L. (2013). Self-perception but not peer reputation of bullying victimization is associated with non-clinical psychotic experiences in adolescents. *Psychological Medicine, 43*, 781–787.

*Guerra, N. G., Williams, K. R., & Sadek, S. (2011). Understanding bullying and victimization during childhood and adolescence: A mixed methods study. *Child Development, 82*, 295–310.

Harter, S. (1985). *Self-perception profile for children:(revision of the perceived competence scale for children).* Universidad de Denver.

Hawker, D. S., & Boulton, M. J. (2000). Twenty years' research on peer victimization and psychosocial maladjustment: A meta-analytic review of cross-sectional studies. *Journal of Child Psychology and Psychiatry, 41*, 441–455.

Hedges, L. V., & Vevea, J. L. (1998). Fixed- and random-effects models in meta-analysis. *Psychological Methods, 3*(4), 486–504. https://doi.org/10.1037/1082-989X.3.4.486.

*Houbre, B., Tarquinio, C., & Lanfranchi, J. B. (2010). Expression of self-concept and adjustment against repeated aggressions: The case of a longitudinal study on school bullying. *European Journal of Psychology of Education, 25*, 105–123.

Kerr, D. C., Gini, G., & Capaldi, D. M. (2017). Young men's suicidal behavior, depression, crime, and substance use risks linked to childhood teasing. *Child Abuse & Neglect, 67*, 32–43.

*Leeuwis, F. H., Koot, H. M., Creemers, D. H., & Van Lier, P. A. (2015). Implicit and explicit self-esteem discrepancies, victimization and the development of late childhood internalizing problems. *Journal of Abnormal Child Psychology, 43*, 909–919.

*Nishino, Y., Ujiie, T., Ninomiya, K., Igarashi, A., Inoue, H., & Yamamoto, C. (2011). Longitudinal study of the relationship between victimization and later emotional problems among Japanese junior high school students. *Journal of Aggression, Conflict and Peace Research, 3*, 115–121.

Marsh, H. W. (1988). SDQ I Manual & Research Monograph: Self-description Questionnaire. Psychological Corporation [and] Harcourt Brace Jovanovich.

McDougall, P., & Vaillancourt, T. (2015). Long-term adult outcomes of peer victimization in childhood and adolescence: Pathways to adjustment and maladjustment. *American Psychologist, 70*, 300–310.

Modecki, K. L., Barber, B. L., & Vernon, L. (2013). Mapping developmental precursors of cyber-aggression: Trajectories of risk predict perpetration and victimization. *Journal of Youth and Adolescence, 42*, 651–661.

O'Moore, A. M., & Minton, S. J. (2005). Evaluation of the effectiveness of an anti-bullying programme in primary schools. *Aggressive Behavior, 31*, 609–622.

*Overbeek, G., Zeevalkink, H., Vermulst, A., & Scholte, R. H. (2010). Peer victimization, self-esteem, and ego resilience types in adolescents: A prospective analysis of person-context interactions. *Social Development, 19,* 270–284.

Pellegrini, A. D., & Bartini, M. (2000). A longitudinal study of bullying, victimization, and peer affiliation during the transition from primary school to middle school. *American Educational Research Journal, 37,* 699–725.

Pouwels, J. L., Souren, P. M., Lansu, T. A., & Cillessen, A. H. (2016). Stability of peer victimization: A meta-analysis of longitudinal research. *Developmental Review, 40,* 1–24.

*Rao, M. A. (2013). *Peer victimization and substance use in early adolescense. Longitudinal analyses of risk and protective factors.* Illinois: University of Illinois.

Reijntjes, A., Kamphuis, J. H., Prinzie, P., Boelen, P. A., Van der Schoot, M., & Telch, M. J. (2011). Prospective linkages between peer victimization and externalizing problems in children: A meta-analysis. *Aggressive Behavior, 37,* 215–222.

Reijntjes, A., Kamphuis, J. H., Prinzie, P., & Telch, M. J. (2010). Peer victimization and internalizing problems in children: A meta-analysis of longitudinal studies. *Child Abuse & Neglect, 34,* 244–252.

Reynolds, C. R., & Kamphaus, R. W. (2004). *Behavior assessment scale for children.* Bloomington, MN: Pearson Assessments.

*Roeder, K. M., Cole, D. A., Sinclair, K. R., Dukewich, T. L., Preacher, K. J., Felton, J. W., ... Tilghman-Osborne, C. (2014). Sensitive periods for the effect of peer victimization on self-cognition: Moderation by age and gender. *Development and Psychopathology, 26,* 1035–1048.

*Romero, P. A. (2007). *Personal and interpersonal antecedents of victimization across the transition to high school.* New York: St. John's University.

*Rueger, S. Y., Malecki, C. K., & Demaray, M. K. (2011). Stability of peer victimization in early adolescence: Effects of timing and duration. *Journal of School Psychology, 49,* 443–464.

Rosenberg, M. (1965). *Society and the adolescent self-image.* Princeton, NJ: Princeton University Press.

Salmivalli, C. (2010). Bullying and the peer group: A review. *Aggression and Violent Behavior, 15,* 112–120.

*Salmivalli, C., & Isaacs, J. (2005). Prospective relations among victimization, rejection, friendlessness, and children's self-and peer-perceptions. *Child Development, 76,* 1161–1171.

Salmivalli, C., Karhunen, J., & Lagerspetz, K. M. J. (1996). How do the victims respond to bullying? *Aggressive Behavior, 22,* 99–109.

Salmivalli, C., Kaukiainen, A., Kaistaniemi, L., & Lagerspetz, K. M. J. (1999). Self-evaluated self-esteem, peer-evaluated self-esteem, and defensive egotism as predictors of adolescents' participation in bullying situations. *Personality and Social Psychology, 25,* 1268–1278.

Sameroff, A. J. (1987). The social context of development. In N. Eisenberg (Ed.). *Contemporary topics in developmental psychology.* New York: Wiley.

*Sapouna, M., & Wolke, D. (2013). Resilience to bullying victimization: The role of individual, family and peer characteristics. *Child Abuse & Neglect, 37,* 997–1006.

Scheithauer, H., Hayer, T., Petermann, F., & Jugert, G. (2006). Physical, verbal, and relational forms of bullying among German students: Age trends, gender differences, and correlates. *Aggressive Behavior, 32,* 261–275.

Smokowski, P. R., Evans, C. B., & Cotter, K. L. (2014). The differential impacts of episodic, chronic, and cumulative physical bullying and cyberbullying: The effects of victimization on the school experiences, social support, and mental health of rural adolescents. *Violence and Victims, 29,* 1029–1046.

*Stanley, C. T. (2007). *The moderating effects of organized activities on the relations between body mass and psychological adjustment in adolescents.* Chicago: Loyola University.

Takizawa, R., Maughan, B., & Arseneault, L. (2014). Adult health outcomes of childhood bullying victimization: Evidence from a five-decade longitudinal British birth cohort. *American Journal of Psychiatry, 171,* 777–784.

Ttofi, M. M., Farrington, D. P., & Lösel, F. (2012). School bullying as a predictor of violence later in life: A systematic review and meta-analysis of prospective longitudinal studies. *Aggression and Violent Behavior, 17,* 405–418.

Ttofi, M. M., Farrington, D. P., Lösel, F., & Loeber, R. (2011). Do the victims of school bullies tend to become depressed later in life? A systematic review and meta-analysis of longitudinal studies. *Journal of Aggression, Conflict and Peace Research, 3,* 63–73.

Turner, H. A., Finkelhor, D., Shattuck, A., Hamby, S., & Mitchell, K. (2015). Beyond bullying: Aggravating elements of peer victimization episodes. *School Psychology Quarterly, 30,* 366–384.

Van Geel, M., Goemans, A., & Vedder, P. (2015). A meta-analysis on the relation between peer victimization and adolescent non-suicidal self-injury. *Psychiatry Research, 230,* 364–368.

Van Geel, M., Goemans, A., & Vedder, P. H. (2016). The relation between peer victimization and sleeping problems: A meta-analysis. *Sleep Medicine Reviews, 27,* 89–95.

Van Geel, M., Vedder, P., & Tanilon, J. (2014). Relationship between peer victimization, cyberbullying, and suicide in children and adolescents: A meta-analysis. *JAMA Pediatrics, 168,* 435–442.

Van Geel, M., Toprak, F., Goemans, A., Zwaanswijk, W., & Vedder, P. (2017). Are youth psychopathic traits related to bullying? Meta-analyses on callous-unemotional traits, narcissism, and impulsivity. *Child Psychiatry & Human Development, 48*(5), 768–777.

Veenstra, R., Lindenberg, S., Munniksma, A., & Dijkstra, J. K. (2010). The complex relation between bullying, victimization, acceptance, and rejection: Giving special attention to status, affection, and sex differences. *Child Development, 81,* 480–486.

Volk, A. A., Dane, A. V., & Marini, Z. A. (2014). What is bullying? A theoretical redefinition. *Developmental Review, 34,* 327–343.

*Wang, C. (2011). *A longitudinal examination of peer victimization, self-esteem, depression, and anxiety among adolescents: A test of cognitive diathesis-stress theory.* Nebraska: University of Nebraska.

Weinberger, D. A., & Schwartz, G. E. (1990). Distress and restraint as superordinate dimensions of self-reported adjustment: A typological perspective. *Journal of Personality, 58,* 381–417.

*Yang, S. J., Stewart, R., Kim, J. M., Kim, S. W., Shin, I. S., Dewey, M. E., ... Yoon, J. S. (2013). Differences in predictors of traditional and cyber-bullying: A 2-year longitudinal study in Korean school children. *European Child & Adolescent Psychiatry, 22,* 309–318.