A Vicious Cycle of Peer Victimization?

Problem Behavior Mediates Stability in Peer Victimization over Time

Margit Averdijk[1], Tina Malti[2], Manuel Eisner[3], Denis Ribeaud[1], & David P. Farrington[3]

[1] Chair of Sociology, Swiss Federal Institute of Technology Zurich (ETH)

[2] Department of Psychology, University of Toronto

[3] Institute of Criminology, University of Cambridge

Abstract

Purpose: To investigate the mediating role of children's internalizing symptoms and aggressive behavior in cycles of peer victimization. We hypothesized that victimization increases internalizing problems, reactive, and indirect aggression, which in turn were expected to increase the likelihood of later peer victimization.

Methods: Data from four waves of a longitudinal study among a culturally diverse sample of 7- to 11-year-olds were used. Peer victimization was assessed via children's self-reports. Parents and children rated internalizing symptoms. Teachers provided information about proactive, reactive, and indirect aggression. We tested our hypotheses using path models with maximum likelihood estimation. Multiple imputation was used to treat the missing values.

Results: Path analyses revealed that peer victimization increased later internalizing symptoms and reactive and indirect aggression when controlled for previous problem behavior. In contrast, proactive aggression was not affected by peer victimization. Reactive aggression and internalizing symptoms mediated the effect of prior on later peer victimization.

Conclusions: Our findings indicate that children's problem behavior may contribute to an escalating cycle of peer victimization.

Keywords: Aggression, peer relationships, anxiety, depression, longitudinal study.

A Vicious Cycle of Peer Victimization?

Problem Behavior Mediates Stability in Peer Victimization over Time

Developmental research indicates that peer victimization is characterized by both change and stability over time: While victimization remains a rare or transitory experience for many children, some are victimized over and over again (e.g., Cillessen & Lansu, 2015; Bowes, Maughan, Ball, Shakoor, Ouellet-Morin, Caspi et al., 2013; Goldbaum, Craig, Pepler, & Connolly, 2003; Kochenderfer-Ladd & Wardrop, 2001). This finding is in line with the broader criminological literature, which has demonstrated that certain persons are at increased risk for repeat victimization, sometimes across long periods of time (Lauritsen & Davis-Quinet, 1995; Tillyer, 2014). However, despite the body of research that has documented this fact, our understanding of why some continue to be victimized while others are not is still limited (Turanovic & Pratt, 2014). Two explanations can be offered (Nagin & Paternoster, 2000; Tseloni & Pease, 2003): The first is that the victim has high-stable risk factors, such as affiliations with aggressive peers or immersion in a high-risk environment (Hindelang, Gottfredson, & Garofalo, 1978; Kochenderfer-Ladd, Ladd, & Kochel, 2009), which influence both his/her risk of prior and later victimization, making the relation between prior and later victimization non-causal. The second is that victimization itself sets processes in motion that increase later victimization risk. Here, we investigated the latter explanation because it still remains empirically unclear how victimization exacerbates itself. Although prior research has indeed shown that victimization itself increases the risk of subsequent victimization (Lauritsen & Davis-Quinet, 1995; Tseloni & Pease, 2003; Wittebrood & Nieuwbeerta, 2000), it is unclear which processes are responsible for this, as studies that treat responses to earlier victimization as dynamic processes that, in turn, affect later victimization are rare (Turanovic & Pratt, 2014).

In the current paper, we hypothesized that one important process behind the link

between prior and later victimization is that victimization can increase a victim's problem behavior, in turn increasing future victimization risk. Specifically, we tested whether the link between prior and later victimization can be explained through the victim's increased internalizing symptoms and aggression caused by the victimization. Although theory and previous research suggest indirect support for this by showing links between internalizing symptoms and aggression with peer victimization (e.g., Baumeister & Leary, 1995; Hanish & Guerra, 2002), it is less clear whether internalizing problems and aggression *mediate* the effect of prior on later victimization.

We focused on peer victimization, because this is a form of victimization that is particularly salient in the childhood and adolescent years, as a substantial part of experienced aggression and violence in this age category occurs between peers (Van Gelder, Averdijk, Ribeaud, & Eisner, 2015). This is not surprising given that children spend a large part of their time in school and among peers, so that this particular social environment has high potential significance for their behavioral development. Research has demonstrated that peer victimization and rejection are associated with potentially serious consequences, whereas positive peer relationships and acceptance have been related to healthy and adaptive child development as well as protection against negative behavioral and psychological outcomes (Finkelhor, Turner, & Ormrod, 2006; Harris, 2009; Hay, Payne, & Chadwick, 2004).

These issues are of import for developmental and life-course criminology for several reasons. First, studying victimization reveals essential information about the nature of crime and antisocial behavior as well as its consequences to victims, which is why it has been termed "an indispensable core of criminological research" (Lauritsen, 2010, 501). Even though the life-course paradigm has not often been applied to victimization within criminology (although there are exceptions, e.g., Tillyer, 2014; Wittebrood & Nieuwbeerta, 2000), developmental research has demonstrated its merit by exploring the factors associated with stability and change in (peer) victimization trajectories over time (e.g., Goldbaum et al.,

2003). Second, victimization among those of young age, especially repeat peer aggression and

bullying, can be particularly detrimental as it may set the stage for later malfunctioning,

decreased mental health, and criminal involvement (Bouffard & Koeppel, 2014; Finkelhor,

2008; Turanovic & Pratt, 2015). Thus, a better understanding of which mechanisms are

responsible for repeat victimization is crucial for interrupting its continuity over time. As a

case in point, examining how reciprocal cycles of victimization and perpetration are broken or

exacerbated has been termed "one of the most useful directions for individual-level research"

(Lauritsen, 2010, p. 507) because it has the potential to reduce both victimization and

perpetration.

We used data from a Swiss longitudinal sample of 7- to 11-year-olds. We deliberately

focused on these ages, because victimization stabilizes around late elementary to middle

school, but is less stable in early elementary school (Boulton & Smith, 1994; Ladd &

Kochenderfer-Ladd, 2002). We tested our hypotheses using path analyses. In order to increase

the robustness of our results and reduce the possibility that they are due to pre-existing

differences in problem behavior between children, we controlled for several covariates,

including prior internalizing problems and aggression. In addition, because they have been

shown to be conceptually distinct in the literature and are likely differentially related to

victimization, we tested the relations of different forms of aggression (i.e., reactive, proactive,

and indirect) with peer victimization (Little, Henrich, Jones, & Hawley, 2003).

Peer victimization and problem behavior

Peer victimization occurs when a child experiences intentional hurtful behavior by a

(group of) peer(s) (Harris, 2009). We investigated the relations of peer victimization with two

major domains of problem behavior, namely internalizing problems and aggression, because

research clearly indicates that these domains are related to victimization (Brendgen et al.,

2008; Card & Hodges, 2008; Hanish & Guerra, 2002; Prinstein, Cheah, & Guyer, 2005) and

comorbid (Garber, Quiggle, Panak, & Dodge, 1991). It is therefore important to investigate

them simultaneously. Specifically, we tested two subsequent effects, (1) the effect of victimization on problem behavior and (2) the effect of problem behavior on victimization (Figure 1). Although few if any studies have investigated this specific mediating mechanism by problem behavior in cycles of repeated victimization over time, various studies shed light on both effects separately, suggesting indirect support for the plausibility of our mediation hypotheses. We discuss these studies in the following.

Peer victimization and internalizing problems

Theoretically, peer victimization is expected to be associated with internalizing symptoms since being victimized is typically an expression of social exclusion (Kvarme, Helseth, Sæteren, & Natvig, 2010). Social exclusion, in turn, interferes with humans' fundamental need to belong to social groups, which is required for well-being and positive emotions (Baumeister & Leary, 1995). Although longitudinal studies have provided mixed results, with some finding an effect of peer victimization on internalizing symptoms (e.g., Fekkes, Pijpers, Fredriks, Vogels, & Verloove-Vanhorick, 2006; Hodges & Perry, 1999), but others not (e.g., Kochel, Ladd, & Rudolph, 2012; Leadbeater & Hoglund, 2009), these discrepancies are likely in large part due to differences in research design (Ttofi et al., 2011). A meta-analysis showed that the odds of later internalizing problems for victims were 1.74 times higher than for non-victims, suggesting considerable negative psychological effects of peer victimization for its victims (Ttofi, Farrington, Lösel, & Loeber, 2011).

The effect of internalizing problems on victimization has received much less attention. This is surprising given that this assumption is supported theoretically by an individual differences perspective grounded in the idea of aggression as social interaction (Van Gelder et al., 2015). According to this perspective, most instances of aggression imply social interaction and, in turn, social interaction and interpersonal behavior are influenced by the psychological characteristics of the participants in the aggressive interaction. As such, it has been hypothesized that victim's emotional states and behavior, which include their internalizing

problems in particular, influence their victimization risk. Specifically, children with internalizing problems display a lack of social competencies and heightened reassurance seeking, which disturb interpersonal relationships (Rudolph, Flynn, & Abaied, 2008) and likely put them at risk for peer victimization. Longitudinal research on the latter link is inconsistent, however (e.g., Fekkes et al., 2006; Kochel et al., 2012; Leadbeater & Hoglund, 2009). In fact, a meta-analysis reported only a small effect ($r = .08$) (Reijntjes, Kamphuis, Prinzie, & Telch, 2010).

Thus, longitudinal studies provide mixed evidence for reciprocal effects between victimization and internalizing problems. However, our hypothesis that internalizing behavior *mediates* stability in victimization has gone almost entirely unstudied except for two studies. In the first, Leadbeater and Hoglund (2009, Model 4) found no prospective relations in a four-wave cross-lagged model. However, Kochel and colleagues (2012) used a three-wave cross-lagged model and found that peer victimization did not precede depression, but that depression did precede peer victimization. However, both studies controlled for internalizing problems measured at the same time as victimization and thus only tested whether T1 victimization was related to *increases* in internalizing problems between T1 and T2. A better procedure, which has not been used in previous studies, is to control for problem behavior *before* victimization because victimization and internalizing problems are contemporaneously already associated.

Peer victimization and aggression

Although studies have documented that peer victimization is followed by increases in overt aggression (e.g., Rudolph, Troop-Gordon, Hessel, & Schmidt, 2011) and that overt aggression and externalizing behavior are followed by increases in peer victimization (e.g., Van Lier & Koot, 2010; Ladd & Troop-Gordon, 2003), few studies have investigated the mediating role of aggression in stability in peer victimization (Leadbeater & Hoglund, 2009). Furthermore, studies have not acknowledged the multidimensional nature of aggression. We

therefore separated proactive overt aggression, reactive overt aggression, and indirect aggression (Brendgen, Vitaro, Tremblay, & Lavoie, 2001; Crick & Dodge, 1996). Proactive aggression is 'cold-headed', instrumental aggression motivated by an anticipated self-serving outcome (Little et al., 2003). In contrast, reactive aggression is a defensive, frustrated, or angry response to provocation and perceived threat (Berkowitz, 1962). Because peer victimization is likely to be perceived as a threat and provocation, it should lead to reactive, but not proactive, aggression by the victim. Importantly, the association extends beyond the concurrent situational context. Specifically, prior experiences of victimization are likely to influence the perception of future similar situations, yielding a readiness to perceive further real or imagined threats and corresponding behavioral responses to such situations, which may result in prolonged patterns of hostile responses to provocation (Berkowitz, 1962). As such, learning may influence reactively aggressive behavioral tendencies. In turn, reactive aggression may cause further peer victimization, because it is a sign of frustration and powerlessness that aggressors find rewarding. Indeed Salmivalli et al. (1996) found that victims' counterattacks were perceived to provoke aggressors into further peer aggression.

However, longitudinal studies are mixed and have not examined mediation (Camodeca, Goossens, Meerum Terwogt, & Schuengel, 2002; Lamarche, Brengen, Boivin, Vitaro, Dionne, & Pérusse, 2007) except for one study. Salmivalli and Helteenvuori (2007) examined mediation among 10- to 13-year-olds. For boys, T1 reactive aggression increased levels of victimization at T2, but proactive aggression at T1 *decreased* victimization at T2. Furthermore, T1 victimization decreased proactive aggression at T2. However, the relations between T1 and T2 were not controlled for victimization and aggression prior to T1. Interestingly, no relations were present between the T2 and T3 variables, when T1 measures of these variables were included, suggesting that controlling for levels of the dependent variables *prior* to the predictor may render the relations spurious.

Overall, these studies suggest that peer victimization is linked to reactive aggression,

especially for boys. However, less overt forms of aggression remain under-studied. Here, we focused on indirect aggression, which is non-confrontational behavior aimed at damaging the target's social relationships (Card, Stucky, Sawalani, & Little, 2008). Few if any longitudinal studies on the relation between victimization and indirect aggression have been conducted and it is unknown whether indirect aggression mediates stability in peer victimization. However, some related studies have shown that victimization is associated with other covert forms of aggression (i.e., relational aggression; Rudolph et al., 2011; Yeung & Leadbeater, 2007). It is plausible that victimization affects covert forms of aggression because covert provocations may elicit hostile attributional biases, which in turn lead to retaliatory aggressive responses. There is some empirical evidence that supports this hypothesized pathway, as one study showed that hostile attribution bias partially mediated the victimization-perpetration overlap for covert forms of aggression (Yeung & Leadbeater, 2007). According to the authors, victims may interpret covert provocations as intentional and subsequently retaliate either to harm the perpetrator or to defend themselves.

In summary, we expected that peer victimization increases internalizing problems, reactive, and indirect aggression, which in turn increase later victimization risk. Guided by theory, we expected that peer victimization increases internalizing problems, reactive, and indirect aggression, which in turn increase the likelihood of later peer victimization. The effect on reactive aggression was hypothesized to be primarily present for boys, which is in line with the empirical findings cited above as well as with theoretical expectations for at least two reasons. First, physical aggression holds more significance in male peer groups as it is a sign of strength and avoids one being labeled an "easy target" (e.g., Benenson, 2009). Second, according to gender specific socialization practices and stereotypes, it is socially more acceptable for boys to express physical aggression after victimization than for girls (Brody, 2000).

Method

Participants

Data were drawn from a combined longitudinal and intervention study, the Zurich Project on the Social Development of Children and Youths (*z-proso*). A stratified sample of 56 schools was drawn after classification by enrollment size and socioeconomic background; the final sample was all 1,675 first graders. The implemented interventions did not affect aggression, internalizing problems, or peer victimization (citations withheld for peer review).

Data were collected from the primary caregiver, the child, and the teacher. The mean age of the children was 7.45 years ($SD = 0.39$) at T1, 8.11 years ($SD = 0.38$) at T2, 9.10 years ($SD = 0.38$) at T3, and 11.33 years ($SD = 0.37$) at T4. At T1, the response rate was 81% for the children ($N = 1,361$) and the teachers ($N = 1,350$) and 74% for the parents ($N = 1,240$). At T2, the retention rate was 97% for the children, 96% for the teachers, and 95% for the parents; at T3, the retention rate was 96% for the children, 93% for the teachers, and 94% for the parents; at T4, the retention rate was 83% for the children, 72% for the teachers, and 85% for the parents.

The sample was 52% male. In 46% of all cases both parents were born outside of Switzerland and moved to Switzerland later in life. In total, the parents come from over 80 different countries, with relatively high proportions from Serbia-Montenegro, Germany, Portugal, the Middle/Far East, Sri Lanka, and Turkey. Compared to Swiss parents, non-Swiss parents had a lower level of education, higher rates of unemployment, were less integrated into their neighborhood, and participated less in their children's school (Eisner, Ribeaud, & Topçuoglu, 2008). Of the parents, 23% had little to no secondary education, 27% had vocational training, 29% had attended full-time vocational school or had earned a baccalaureate degree or advanced vocational diploma, and 20% had a university degree.

Parental consent was obtained for each participant. In the first three waves, computer-assisted 45-minute child interviews were conducted at school. The children and the

interviewers sat down together, both facing the laptop screen. The interviewers asked each

question aloud and entered the given answer. For the Social Behavior Questionnaire (see

below), the children were given the laptop and entered the answers themselves, which was

facilitated by a special child-friendly format in which a computer mouse was used to click on

either of two large buttons (for "yes" and "no") on the laptop screen. At T4, the children

completed a paper-and-pencil questionnaire due to their increased cognitive capabilities.

Computer-assisted parent interviews were conducted at the respondent's home. The

interviewers read each question aloud. The parents were given a booklet with the answer

categories and gave their answer verbally. The interviewers then entered the answer given by

the parent on a laptop. All contact letters and parent interviews were translated into the nine

languages most frequently spoken by the immigrant minorities. The teachers completed a

questionnaire at all waves. The temporal order of the interviews and measurements is clarified

in Table 1.

Measures

     Peer victimization. Peer victimization was assessed through self-report. The scale was

derived from Olweus (1993) and has shown consistency and predictive validity with cross-

informant behavioral measures (citation withheld for peer review). At T2, the items were

illustrated by drawings showing different forms of peer victimization and specifically

designed for use with 5- to 8-year-olds (Perren & Alsaker, 2006). Four types of victimization

were included: Teasing in a mean and hurtful way, stealing and destroying possessions,

physical violence, and rejection/exclusion since the school year had started (about three

months earlier). The answer categories ranged from 0 to 4. At T4, the reference period was

the past year due to the increased cognitive capacities of the children; the answer categories

ranged from 0 to 5 this time ($\alpha = .65$ at T2; $\alpha = .72$ at T4). The responses were summed (T2:

$M = 3.34$, $SD = 2.98$; T4: $M = 3.12$, $SD = 3.16$). We created quintiles for the path analyses to

make the scales comparable across the waves because a ranking of the values of the scale and

inspection of the number of cases in each resulting category revealed that there was sufficient

variation to create five (but not more) categories.

Aggression and internalizing problems. Problem behavior was assessed at T1 and T3

by the teachers, the children, and the parents using the Social Behavior Questionnaire (SBQ;

Tremblay et al., 1991). Tremblay et al. (1991) reported internal consistency, test-retest

reliability, stability over time, and concurrent and predictive validity. Responses from the

parents and teachers were recorded on a 5-point Likert scale. The children were shown

drawings of a child's specific acts and asked whether they sometimes do what is shown. A for

children easily understandable yes/no format with good reliability and validity was used

(Linares Scott, Short, Singer, Russ, & Minnes, 2006).

Four SBQ items measured proactive aggression (e.g., "threatens others"); three items

measured reactive aggression (e.g., "reacts aggressively when someone contradicts him/her");

three items measured indirect aggression (e.g., "When angry at another child, (s)he makes

other people exclude this child"). We averaged these items. Our choice for the specific

informant was informed by theory and prior research and not by empirical exploration.

Teachers are supposed to be stronger raters than parents whereas young children's ability to

report adequately and consistently on their externalizing behavior is limited (Loeber, Green,

Lahey, & Stouthamer-Loeber, 1991). We therefore used teacher reports to assess aggression.

Cronbach's alphas were: .87 (T1 and T3) for proactive, .92 (T1) and .93 (T3) for reactive, and

.94 (T1) and .95 (T3) for indirect aggression. The mean levels were .41 ($SD = .64$) at T1 and

.43 ($SD = .64$) at T3 for proactive aggression; .94 ($SD = .96$) at T1 and .95 ($SD = .93$) at T3

for reactive aggression, and .66 ($SD = .88$) at T1 and .72 ($SD = .89$) at T3 for indirect

aggression. To reduce the skewness of the aggression variables, we examined their empirical

distribution and, based on a ranking of the values and the number of cases in each resulting

category, created quartiles for reactive and proactive aggression, and tertiles for indirect

aggression, which comprises a normalization strategy to eliminate skew (Cohen, Cohen,

West, & Aiken, 2013).

Nine SBQ items measured internalizing symptoms, i.e. anxiety and depression (Kovacs & Devlin, 1998) (e.g., "The child cries a lot"). Along with parents, children are perceived as more useful informants than teachers for internalizing symptoms (e.g., Kamphaus, Huberty, DiStefano, & Petoskey, 1997). We therefore used the children's and parents' accounts. Cronbach's alphas were: Parents $\alpha = .71$ (T1), $\alpha = .75$ (T3); children $\alpha = .62$ (T1), $\alpha = .71$ (T3). As expected (Achenbach, McConaughey, & Howell, 1987), the correlation between the parents and the children was low (.08 at T1 and .09 at T3, both $p < .01$). The mean levels of internalizing problems were .70 ($SD = .46$) at T1 and .85 ($SD = .49$) at T3 for the parents and .41 ($SD = .24$) at T1 and .38 ($SD = .24$) at T3 for the children.

Control variables. To reduce the possibility that the empirical relations were due to third factors, we conducted a literature review to identify risk factors that predicted both victimization and child problem behavior. Based on this, the following control variables were included. *Socio-economic status* (Beidel & Turner, 1997; McClure, Brennan, Hammen, & Le Brocque, 2001; Schwartz, Dodge, Pettit, & Bates, 1997) was based on coding the caregivers' current professions (Elias & Birch 1994) and transforming the codes into an International Socio-Economic Index of occupational status (ISEI) score (Ganzeboom et al. 1992). *Parental conflict* (Buehler, Anthony, Krishnakumar, Stone, Gerard, & Pemberton, 1997; Rhoades, 2008; Schwartz et al., 1997) was measured as extended periods of serious conflict between cohabitating partners or between a caregiver and a non-cohabitating partner. It was reported using an Event History Calendar, which was especially designed to capture the most important events in the child's life from birth to age 7 (see Averdijk, Malti, Eisner, & Ribeaud, 2011). Attention Deficit Hyperactivity Disorder (*ADHD*; Card et al., 2008) was measured through 8 teacher-reported items on the SBQ. *Sensation-seeking* (Jensen-Campbell, Knack, Waldrip, & Ramirez, 2009; Kaslow, Rehm, & Siegel, 1984; Ribeaud & Eisner, 2010)*, was included as an aspect of self-control deficits and measured through a board game where

the children chose between adventuresome and secure options. We also included *prior*

aggression and internalizing problems to ensure that the influence of victimization on

problem behavior was due to victimization itself and not to pre-existing differences in levels

of problem behavior.

      Measurement scheme. Our temporal measurement scheme was as follows. The

predictor of interest (i.e., peer victimization) were measured at T2 and preceded the

measurement of the mediators (internalizing problems and aggression), which were measured

at T3. These, in turn, preceded the dependent variable (i.e., later peer victimization), which

was measured at T4. Thus, the time order of the variables was unambiguous. In accordance

with the Cambridge Quality Checklists (Murray, Farrington, & Eisner, 2009), T1 measures

were used only for the control variables (i.e., prior internalizing problems, prior aggression,

SES, parental conflict, ADHD) to avoid that they might act as mediators.

      Missing data. Child attrition between T1 and T4 was related to T1 aggression

(proactive: $OR = 1.40$, $p < .01$; reactive: $OR = 1.28$, $p < .01$; indirect: $OR = 1.23$, $p < .01$), but

not to child- ($OR = 1.29$, $p > .05$) or parent-reported ($OR = .79$, $p > .05$) internalizing

problems. Child attrition between T2 and T4 was weakly related to T2 peer victimization (OR

$= 1.06$, $p < .05$). The missing values were not distributed randomly (Little's MCAR test, χ^2

$(267) = 355.19$, $p < 0.01$). For those children who participated in all waves, 597 of all 19,142

data-points (3.12%) were missing. We therefore used multiple imputation using fully

conditional specification in SPSS; the number of imputations was 10. The final sample size

for the path models was $N = 1,126$. We conducted the path analyses for each imputation

separately in Stata and calculated the overall estimates (Allison, 2001).

Data analysis

      We used path models to test our hypotheses. Probability plots indicated some

deviations from multivariate normality; we therefore used maximum likelihood (ML) under

conditional normality (Stata, 2011). In ML, the recommended fit statistics are the

standardized root mean square residual (SRMR) supplemented by one of the following: The Tucker Lewis index (TLI), the comparative fit index (CFI), or the root mean square error of approximation (RMSEA). We inspected all four, with cut-offs of close to SRMR < .08, TLI > .95, CFI > .95, RMSEA < .06 (Hu & Bentler, 1999). All models were re-estimated using quasi-maximum likelihood with the Huber/White/sandwich robust variance estimator, which gives accurate estimates even when the model is miss-specified; results were similar.

Results

Descriptive statistics

Many children experienced peer victimization at least once or twice (Table 2). A substantial minority of the children was victimized regularly. Boys reported more peer victimization than girls, $t(1326) = -2.669$, $p < .01$, Cohen's d $= 0.15$ at T2; $t(1144) = -3.168$, $p < .01$, Cohen's d $= 0.19$ at T4.

Next, zero-order correlations between the study variables were computed. The findings showed substantial correlations between victimization and problem behavior (Table 3). Victimization was more strongly correlated with reactive than with proactive aggression; in fact, T3 proactive aggression was not significantly correlated with T4 victimization. Indirect aggression was only related to T2, not T4, peer victimization. For internalizing problems, victimization was more strongly correlated with child-reported than with parent-reported internalizing problems. There were strong correlations between the aggression measures within the waves.

Factor structure aggression

To investigate evidence for a three-factor structure, the 10 aggression items were analyzed using confirmatory factor analysis in Stata. Two models were estimated: A one-factor model with all 10 items, and a three-factor model with 4 items for proactive aggression, 3 items for reactive aggression, and 3 items for indirect aggression. The fit indices for the three-factor, but not the one-factor, model indicated mostly satisfactory fit (*SRMR* = .04; *CFI*

= .97; *TLI* = .96), but the *RMSEA* was suboptimal (.09). Modification indices suggested improved fit when a covariance between the error terms of the items 'aggressive when teased' and 'aggressive when something taken' and between the error terms of the items 'threatens' and 'intimidates' was added (Table 4). This made substantive sense since the first two both referred to an underlying reaction to bullying and the second two to proactive non-physical coercion. The covariances were added, which led to acceptable model fit (*SRMR* = .03; *CFI* = .98; *TLI* = .97; *RMSEA* = .08). The three-factor model showed better fit than the one-factor model (*LR* $\chi^2(5)$ = 2635.51, *p* <.001).

Victimization and problem behavior

We next estimated a path model to test the hypothesized relations between victimization and problem behavior. All models were controlled for the covariates measured at T1 (i.e., prior internalizing problems, prior aggression, ADHD, SES, parental conflict, and sensation seeking). The residual variances between aggression and internalizing problems were allowed to covary. The first model used child-reported internalizing behavior; the second used parent-reported internalizing behavior (Table 5). Victimization increased reactive and indirect, but not proactive aggression. Victimization affected internalizing problems, but only the child reports. Reactive aggression and internalizing problems (but not proactive and indirect aggression) increased subsequent victimization. The statistical significance of the indirect effect shows that the effect of prior victimization on subsequent victimization was mediated by problem behavior, i.e., reactive aggression and internalizing problems (Acock, 2013). In total, 7% (.01/.15) to 14% (.02/.14) of the total effect of prior on later victimization was mediated. There was a strong remaining direct effect of prior victimization.

Finally, we tested a multi-group model in which the parameters were allowed to vary by gender. This model fit the data better than the single-group model (model with child-reported internalizing problems: Range of LR $\chi^2(48)$ = 570.88, *p* <.001 to LR $\chi^2(48)$ = 584.58, *p* <.001 across imputations; model with parent-reported internalizing problems: Range of LR

$\chi^2(48) = 508.25$, $p <.001$ to LR $\chi^2(48) = 529.06$, $p <.001$ across imputations). The only fit

statistics that are reported by Stata for the group-specific models are the SRMR and the

coefficient of determination (Table 6). Contrary to our hypothesis, the effect of victimization

on reactive aggression did not differ by gender: Wald test, range of $\chi^2(1) = 0.03$, $p >.05$ to

$\chi^2(1) = 0.34$, $p >.05$ across imputations. The effect of indirect aggression on victimization also

did not differ by gender: Wald test, range of $\chi^2(1) = 1.02$, $p >.05$ to $\chi^2(1) = 2.45$, $p >.05$ across

imputations. The effect of peer victimization on indirect aggression did not remain in the

gender-specific models. The indirect effects were not significant in the models using parent-

reported internalizing problems (Model 2 in Table 6), but they were in the models using child-

reported internalizing problems (Model 1 in Table 6). In the latter case, 13% (.02/.14) of the

total effect of prior and later victimization for boys and 23% (.03/.13) of the total effect for

girls was mediated by internalizing problems and aggressive behavior.

Discussion

Developmental scientists have argued that stability in peer victimization over time can

partly be explained by stable risk factors that make some children vulnerable to repeat

victimization, such as affiliations with aggressive peers or difficulties with emotion regulation

(Kochenderfer-Ladd et al., 2009). It has also be argued and shown that prior victimization

itself causes later victimization (Lauritsen & Davis-Quinet, 1995; Nagin & Paternoster, 2000).

It remains unclear, however, which processes are responsible for the latter association. We

argued that one likely explanation for stability in peer victimization is that victimization leads

to problem behavior in the victim, which in turn leads to an increased future victimization

risk. Our study examined this mechanism by testing the mediation effects of both

internalizing problems and aggression in repeat victimization over time in four-wave

longitudinal data. In doing so, we used a Swiss longitudinal sample of 7- to 11-year-olds.

Our findings were three-fold. First, reactive, but not proactive, aggression mediated

stability in peer victimization. This supports the idea that reactive aggression is a 'hot-headed'

response to provocation while the development of proactive aggression is unrelated to provocation (Arsenio, Adams, & Gold, 2009). The effects on reactive aggression were still present one year later, confirming the theoretical assumption that victimization is related to later aggression beyond the direct situational context of the victimization. In contrast to our hypothesis, we did not find gender differences in the effect of victimization on reactive aggression. Although the effects were stronger for boys than for girls, the difference was not significant, suggesting no support for evolutionary or socialization hypotheses favoring gender differences (Benenson, 2009; Brody, 2000). Instead, our results suggest that there are few differences in the ways in which boys and girls respond to victimization. Furthermore, our results show that reactive aggression is indeed followed by further victimization. Reactive aggression may make children a particularly rewarding target for aggressors (Salmivalli et al., 1996). These reciprocal effects of reactive aggression and victimization held even when controlling for prior levels of aggression.

Our second finding was that victimization was associated with increased indirect aggression. Contrary to our hypothesis, however, this effect did not remain significant in the gender-specific models. Although the effect sizes in the gender-specific models remained of similar magnitude as in the combined models, the *p*-values increased. This suggests that the association between victimization and later indirect aggression is relatively weak and that it only upholds in large samples. Because indirect aggression is covert, victims may see it as a less apt response to experienced victimization compared to more direct and overt forms of aggression, as the harmful effects of covert aggression may (in their eyes) be less obvious and less instantly gratifying.

Third, internalizing problems mediated stability in victimization. These results support the theoretical assumption that not only do experiences of peer victimization and social exclusion thwart happiness and adaptive functioning (Baumeister & Leary, 1995), internalizing symptoms in turn undermine interpersonal functioning and thereby put children

at risk for further victimization. The effect was observed for child-reported internalizing problems only. On the one hand, the effect is likely partly due to shared method variance, since children provided the information for both victimization and internalizing problems. On the other hand, parents may not be fully aware of their children's emotional symptoms and changes therein.

We focused our analysis on 7- to 11-year-olds because this is the age when victimization starts to stabilize. Although it is currently unclear how our findings generalize to older age ranges, it is possible that the mediation effects are even larger for older children given that victimization rates decrease with age and stability increases. On the other hand, it is also possible that victims of older ages respond differently (less aggressive) to victimization, in which case the size of these mediation effects may decrease.

Taken together, our findings provide evidence for a 'vicious cycle of peer victimization' where victimization leads to subsequent victimization, partly through its effects on children's coping strategies, namely internalizing symptoms and aggression. Depending on the model and gender of the child, 7 to 23% of the total effect of prior on later victimization was mediated. The effects were independent of covariates including prior problem behavior. We note that these effects surfaced even though the measures included in the current inquiry were collected across relatively long intervals. Thus, it is important to reduce the long-term negative consequences of peer victimization in order to prevent re-victimization. Helping victims manage their problem behavior may contribute to this. However, since there remains a strong direct effect of victimization on later victimization, preventing peer victimization requires that victim-level interventions are built into encompassing school-wide programs.

There are several ways in which future research could extend our work. First, we did not consider indirect victimization. Given that this may be an important form of victimization, future research should include this. Second, our measure for reactive aggression implies some degree of overlap with victimization, as the items refer to victimization situations. This may

have led to somewhat increased effect sizes. Third, our measure for indirect aggression was mostly attuned to reactive forms of aggression, although this may not be a serious limitation, as victimization was only related to reactive, and not proactive, aggression. Fourth, although we regarded the multi-cultural make-up of our sample as a strength, it is possible that it affects the generalizability of our findings, as immigrant youths may face increased risk of victimization. Fifth, the results may differ according to sub-type of victimization, a possibility that we did not address as we included a summative scale of victimization in our analyses. Future work that investigates potential differences by victimization type is encouraged. Finally, victimization was measured at only two time-points. Future studies that include multiple measures with short time distances in between are encouraged to see whether our findings are generalizable.

Despite these limitations, this study contributes to the literature by simultaneously investigating the relations between peer victimization and internalizing symptoms as well as different forms of aggression. While controlling for pre-existing differences between victims and non-victims, our findings showed that reactive aggression and internalizing symptoms partly mediate stability in victimization. These findings highlight the importance of children's problem behavior in understanding peer victimization. This is not only important theoretically, but also points to the need for preventative strategies to reduce the maladaptive consequences of victimization.

References

Achenbach, T. M., McConaughey, S. H., & Howell, C. T. (1987) Child/adolescent behavioral
and emotional problems: implications of cross-informant correlations for situational
specificity. *Psychological Bulletin, 101*, 213–232.

Acock, A. C. (2013). *Discovering structural equation modeling using Stata.* College Station,
TX: StataCorp.

Allison, P. (2001). *Missing data.* Thousand Oaks, CA: Sage.

Arsenio, W.F, Adams, E., & Gold, J. (2009). Social information processing, moral reasoning,
and emotion attributions: Relations with adolescents' reactive and proactive
aggression. *Child Development, 80*, 1739-1755.

Averdijk, M., Eisner, M., & Ribeaud, D. (2011). Effects of a universal prevention program in
childhood on delinquency and bullying in pre-adolescence. Poster presented at the
conference Evidence-based developmental prevention of violence and bullying.
University of Cambridge.

Averdijk, M., Eisner, M., & Ribeaud, D. (2013). Method effects in survey questions about
peer victimization. In Ruiter, S., Bernasco, W., Huisman, W., & Bruinsma, G. J. N.
(Eds), *Eenvoud & Verscheidenheid. Liber Amicorum voor Henk Elffers* [Simplicity
and Diversity. Festschrift for Henk Elffers], pp. 425-440. Amsterdam: NSCR.

Averdijk, M., Malti, T., Eisner, M., & Ribeaud, D. (2012). Parental separation and child
aggressive and internalizing behavior: An event history calendar analysis. *Child
Psychiatry & Human Development*, *43*(2), 184-200.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal
attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497–
529.

Beidel, D. C., and Turner, S. M. (1997). At risk of anxiety: I. Psychopathology in the offspring of anxious parents. *Journal of the American Academy of Child and Adolescent Psychiatry, 36*, 918-924.

Benenson, J. F. (2009). Sex differences in aggression from an adaptive perspective. In Harris, M. J. (Ed.). *Bullying, rejection, & peer victimization. A social cognitive neuroscience perspective*, pp. 171–198. New York: Springer.

Berkowitz, L. (1962). *Aggression: A social psychological analysis*. New York: McGraw-Hill.

Bouffard, L. A., & Koeppel, M. D. (2014). Understanding the potential long-term physical and mental health consequences of early experiences of victimization. *Justice Quarterly*, *31*(3), 568-587.

Boulton, M. J., & Smith, P. K. (1994). Bully/victim problems in middle-school children: Stability, self-perceived competence, peer perceptions, and peer acceptance. *British Journal of Developmental Psychology, 12*, 315–329.

Bowes, L., Maughan, B., Ball, H., Shakoor, S., Ouellet-Morin, I., Caspi, A., Moffitt, T.E., & Arseneault, L. (2013). Chronic bullying victimization across school transitions: The role of genetic and environmental influences. *Development and Psychopathology, 25*, 333–346.

Brendgen, M., Boivin, M., Vitaro, F., Girard, A., Dionne, G., & Pérusse, D. (2008). Gene– environment interaction between peer victimization and child aggression. *Development and psychopathology*, *20*, 455-471.

Brendgen, M., Vitaro, F., Tremblay, R. E., & Lavoie, F. (2001). Reactive and proactive aggression: Predictions to physical violence in different contexts and moderating effects of parental monitoring and caregiving behavior. *Journal of Abnormal Child Psychology, 29*, 293-304.

Brody, L. R. (2000). The socialization of gender differences in emotional expression: Display rules, infant temperament, and differentiation. In Fischer, A. J. (Ed.), Gender and

emotion, pp. 24–47. Cambridge, U.K.: Cambridge University Press.

Buehler, C., Anthony, C., Krishnakumar, A., Stone, G., Gerard, J., & Pemberton, S. (1997).

Interparental conflict and youth problem behaviors: A meta-analysis. *Journal of Child and Family Studies, 6*, 233—247.

Camodeca, M., Goossens, F. A., Meerum Terwogt, M., & Schuengel, C. (2002). Bullying and victimization among school-age children: Stability and links to proactive and reactive aggression. *Social Development, 11*, 332–345.

Card, N. A., & Hodges, E. V. (2008). Peer victimization among schoolchildren: Correlations, causes, consequences, and considerations in assessment and intervention. *School Psychology Quarterly*, *23*(4), 451.

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development, 79*, 1185–1229.

Cillessen, A. H., & Lansu, T. A. (2015). Stability, correlates, and time-covarying associations of peer victimization from grade 4 to 12. *Journal of Clinical Child & Adolescent Psychology*, *44*(3), 456-470.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2013). *Applied multiple regression/correlation analysis for the behavioral sciences*. Routledge.

Crick, N. R., & Dodge, K. A. (1996). Social information-processing mechanisms in reactive and proactive aggression. *Child Development, 67*, 993–1002.

Eisner, M., Ribeaud, D., Jünger, R., & Meidert, U. (2007). Frühprävention von Gewalt und Aggression. Ergebnisse des Zürcher Interventions- und Präventionsprojektes an Schulen [Early prevention of violence and aggression. Findings from the Zurich intervention and prevention project in schools]. Zürich: Rüegger Verlag.

Eisner, M., Ribeaud, D., & Topçuoglu, T. (2008). Indikatoren zur wirtschaftlichen, sozialen und kulturellen Lage von immigrierten Minderheiten in der Stadt Zürich. Zürich: Stadt Zürich.

Fekkes, M., Pijpers, F. I. M., Fredriks, A. M., Vogels, T., & Verloove-Vanhorick, S. P. (2006). Do bullied children get ill, or do ill children get bullied? A prospective cohort study on the relationship between bullying and health-related symptoms. *Pediatrics, 117*, 1568–1574.

Finkelhor, D. (2008). Childhood victimization. Violence, Crime, and abuse in the lives of young people. Oxford: Oxford University Press.

Finkelhor, D., Turner, H., & Ormrod, R. (2006). Kid's stuff: The nature and impact of peer and sibling violence on younger and older children. *Child Abuse & Neglect*, *30*(12), 1401-1421.

Ganzeboom, H. B. G., Degraaf, P. M., Treiman, D. J., & Deleeuw, J. (1992). A standard international socio-economic index of occupational status. *Social Science Research, 21*, 1–56.

Garber, J., Quiggle, N. L., Panak, W., & Dodge, K. A. (1991). Aggression and depression in children: Comorbidity, specificity, and social cognitive processing. In Cicchetti, D., & Toth, S. L. (Eds.), *Internalizing and Externalizing Expressions of Dysfunction* (pp. 225–264). Hillsdale, NJ: Lawrence Erlbaum.

Goldbaum, S., Craig, W. M., Pepler, D., & Connolly, J. (2003). Developmental trajectories of victimization: Identifying risk and protective factors. *Journal of applied school psychology*, *19*(2), 139-156.

Hanish, L. D., & Guerra, N. G. (2002). A longitudinal analysis of patterns of adjustment following peer victimization. *Development and Psychopathology, 14*, 69–89.

Harris, M. J. (2009) (Ed.). Bullying, rejection, & peer victimization. A social cognitive neuroscience perspective. New York: Springer.

Hindelang, M. J., Gottfredson, M. R., & Garofalo, J. (1978). Victims of personal crime: An

    empirical foundation for a theory of personal victimization. Cambridge, MA:

    Ballinger.

Hodges, E. V. E., & Perry, D. G. (1999). Personal and interpersonal antecedents and

    consequences of victimization by peers. *Journal of Personality and Social Psychology,*

    76, 677–685.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure

    analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling:*

    A Multidisciplinary Journal, 6, 1–55.

Jensen-Campbell, L. A., Knack, J. M., Waldrip, A., & Ramirez, M. (2009). The importance of

    personality and effortful control processes in victimization. In Harris, M. J. (Ed.),

    Bullying, rejection, & peer victimization. A social cognitive neuroscience perspective,

    pp. 103–125. New York, NY: Springer.

Kamphaus, R. W., Huberty, C. J., DiStefano, C., & Petoskey, M. D. (1997). A typology of

    teacher-rated child behavior for a national U.S. sample. *Journal of Abnormal Child*

    Psychology, 25, 453–463.

Kaslow, N. J., Rehm, L. P., and Siegel, A. W. (1984). Social-cognitive and cognitive

    correlates of depression in children. *Journal of Abnormal Child Psychology, 12*, 605-

    620.

Kochenderfer-Ladd, B., Ladd, G. W., & Kochel, K. P. (2009). A child and environment

    framework for studying risk for peer victimization. In Harris, M. J. (Ed.). *Bullying,*

    rejection, & peer victimization. A social cognitive neuroscience perspective, pp. 27–

    52. New York: Springer.

Kochel, K. P., Ladd, G. W., & Rudolph, K. D. (2012). Longitudinal associations among youth

    depressive symptoms, peer victimization, and low peer acceptance: An interpersonal

    process perspective. *Child Development, 83*, 637–650.

Kochenderfer-Ladd, B., & Wardrop, J. L. (2001). Chronicity and instability of children's peer victimization experiences as predictors of loneliness and social satisfaction trajectories. *Child Development, 72*, 134–151.

Kovacs, M., & Devlin, B. (1998). Internalizing disorders in childhood. *Journal of Child Psychology and Psychiatry, 39*, 47–63.

Kvarme, L. G., Helseth, S., Sæteren, B., & Natvig, G. K. (2010). School children's experience of being bullied – and how they envisage their dream day. *Scandinavian Journal of Caring Sciences*, *24*, 791–798.

Ladd, G. W., & Kochenderfer-Ladd, B. (2002). 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, 14*, 74–96.

Ladd. G. W., & Troop-Gordon, W. (2003). The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Development, 74*, 1344–1367.

Lamarche, V., Brendgen, M., Boivin, M., Vitaro, F., Dionne, G., & Pérusse, D. (2007). Do friends' characteristics moderate the prospective links between peer victimization and reactive and proactive aggression? *Journal of Abnormal Child Psychology, 35*, 665–680.

Lauritsen, J. L. (2010). Advances and challenges in empirical studies of victimization. Journal of Quantitative Criminology, 26(4), 501-508.

Lauritsen, J. L., & Quinet, K. F. D. (1995). Repeat victimization among adolescents and young adults. *Journal of Quantitative Criminology*, *11*(2), 143-166.

Leadbeater, B., & Hoglund, W. (2009). The effects of peer victimization and physical aggression on changes in internalizing from first to third grade. *Child Development, 80*, 843–859.

Linares Scott, T. J., Short, E. J., Singer, L. T., Russ, S. W., & Minnes, S. (2006). Psychometric properties of the Dominic Interactive assessment: A computerized self-report for children. *Assessment, 13*, 16–26.

Little, T. D., Henrich, C. C., Jones, S. M., & Hawley, P. H. (2003). Disentangling the "whys" from the "whats" of aggressive behavior. *International Journal of Behavioral Development, 27*, 122–133.

Loeber, R., Green, S. M., Lahey, B. B., Stouthamer-Loeber, M. (1991). Differences and similarities between children, mothers, and teachers as informants on disruptive child behavior. *Journal of Abnormal Child Psychology, 19*, 75–95.

Malti, T., Ribeaud, D., & Eisner, M. (2011). The effectiveness of two universal preventive interventions in reducing children's externalizing behavior: A cluster randomized controlled trial. *Journal of Clinical Child & Adolescent Psychology, 40,* 677–692.

McClure, E. B., Brennan, P. A., Hammen, C., & Le Brocque, R. M. (2001). Parental anxiety disorders, child anxiety disorders, and the perceived parent-child relationship in an Australian high-risk sample. *Journal of Abnormal Child Psychology, 29*, 1-10.

Nagin, D., & Paternoster, R. (2000). Population heterogeneity and state dependence: State of the evidence and directions for future research. *Journal of Quantitative Criminology, 16*, 117–144.

Olweus, D (1993). *Bullying at school. What we know and what we can do*. Oxford: Blackwell.

Perren, S, & Alsaker, F D (2006). Social behavior and peer relationships of victims, bully-victims, and bullies in kindergarten. *The Journal of Child Psychology and Psychiatry, 47*, 45–57.

Prinstein, M. J., Cheah, C. S., & Guyer, A. E. (2005). Peer victimization, cue interpretation, and internalizing symptoms: Preliminary concurrent and longitudinal findings for children and adolescents. *Journal of Clinical Child and Adolescent Psychology*, *34*(1), 11-24.

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.

Rhoades, K. A. (2008). Children's responses to interparental conflict: A meta-analysis of their associations with child adjustment. *Child Development, 79*, 1942--1956.

Ribeaud, D., & Eisner, M. (2010). Risk factors for aggression in pre-adolescence: Risk domains, cumulative risk and gender differences – Results from a prospective longitudinal study in a multi-ethnic urban sample. *European Journal of Criminology, 7*, 460-498.

Rudolph, K. D., Flynn, M., & Abaied, J. L. (2008). A developmental perspective on interpersonal theories of youth depression. In J. R. Z. Abela & B. L. Hankin (Eds.), *Handbook of depression in children and adolescents* (pp. 79–102). New York: Guildford.

Rudolph, K. D., Troop-Gordon, W., Hessel, E. T., & Schmidt, J. D. (2011). A latent growth curve analysis of early and increasing peer victimization as predictors of mental health across elementary school. *Journal of Clinical Child and Adolescent Psychology, 40*, 111–122.

Salmivalli, C., & Helteenvuori, T. (2007). Reactive, but not proactive aggression predicts victimization among boys. *Aggressive Behavior, 33*, 198–206.

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

Schwartz, D., Dodge, K. A., Pettit, G. S., & Bates, J. E. (1997). The early socialization of aggressive victims of bullying. *Child Development, 68*, 665--675.

Stata (2011). *Stata structural equation modeling reference manual.* College Station, TX: StataCorp.

Tillyer, M. S. (2014). Violent Victimization Across the Life Course Moving a "Victim Careers" Agenda Forward. *Criminal Justice and Behavior*, *41*(5), 593-612.

Tseloni, A., & Pease, K. (2003). Repeat Personal Victimization. 'Boosts' or 'Flags'?. *British Journal of Criminology*, *43*(1), 196-212.

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.

Tremblay, R. E., Loeber, R., Gagnon, C., Charlebois, P., Larivee, S., & LeBlanc, M. (1991). Disruptive boys with stable and unstable high fighting behavior patterns during junior elementary school. *Journal of Abnormal Child Psychology, 19*, 285–300.

Turanovic, J. J., & Pratt, T. C. (2014). "Can't stop, won't stop": Self-control, risky lifestyles, and repeat victimization. *Journal of Quantitative Criminology*, *30*(1), 29-56.

Turanovic, J. J., & Pratt, T. C. (2015). Longitudinal effects of violent victimization during adolescence on adverse outcomes in adulthood: a focus on prosocial attachments. *The Journal of Pediatrics*, *166*(4), 1062-1069.

Van Gelder, J. L., Averdijk, M., Eisner, M., & Ribeaud, D. (2015). Unpacking the Victim-Offender Overlap: On Role Differentiation and Socio-psychological Characteristics. *Journal of Quantitative Criminology*, 31, 653-675.

Van Lier, P. A. C., & Koot, H. M. (2010). Developmental cascades of peer relations and symptoms of externalizing and internalizing problems from kindergarten to fourth-grade elementary school. *Development and Psychopathology, 22*, 569-582.

Wittebrood, K., & Nieuwbeerta, P. (2000). Criminal victimization during one's life course: The effects of previous victimization and patterns of routine activities. *Journal of Research in Crime and Delinquency*, *37*, 91-122.

Yeung, R. S., & Leadbeater, B. J. (2007). Does hostile attribution bias for relational provocations mediate the short-term association between relational victimization and

aggression in preadolescence? *Journal of Youth and Adolescence, 36*, 973–983.

Table 1

Temporal order of measurements

Time point	Variables measured
T1	Control variables (i.e., prior internalizing problems, prior aggression, SES, parental conflict, ADHD)
T2	Peer victimization
T3	Mediators (i.e., internalizing problems, aggression)
T4	Later peer victimization

Table 2

Frequencies (%) of peer victimization at T2 and T4

	Teasing	Stealing and destroying	Physical violence	Rejection
T2				
Never	680 (52%)	777 (59%)	710 (54%)	628 (47%)
Once or twice	203 (15%)	348 (26%)	270 (21%)	355 (27%)
More than twice	252 (19%)	143 (11%)	224 (17%)	251 (19%)
At least once per week	107 (8%)	43 (3%)	73 (6%)	60 (5%)
(Almost) every day	72 (6%)	11 (1%)	43 (3%)	32 (2%)
Total	1314 (100%)	1322 (100%)	1320 (100%)	1326 (100%)
T4				
Never	452 (40%)	679 (60%)	669 (59%)	556 (49%)
Once or twice	400 (35%)	318 (28%)	298 (26%)	396 (35%)
3 to 10 times	156 (14%)	99 (9%)	108 (10%)	105 (9%)
About every week	58 (5%)	21 (2%)	22 (2%)	24 (2%)
About every month	37 (3%)	11 (1%)	27 (2%)	30 (3%)
(Almost) every day	34 (3%)	8 (1%)	13 (1%)	26 (2%)
Total	1137 (100%)	1136 (100%)	1137 (100%)	1137 (100%)

Table 3

Pearson's correlations between study variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. T1 proactive aggression												
2. T1 reactive aggression	.60**											
3.T1 indirect aggression	.78**	.56**										
4. T1 internalizing problems (child report)	.06*	.00	.08**									
5. T1 internalizing problems (parent report)	.00	.05	.00	.08**								
6. T2 victimization	.17**	.19**	.18**	.15**	.10**							
7. T3 proactive aggression	.45**	.33**	.40**	.01	-.04	.11**						
8. T3 reactive aggression	.36**	.48**	.32**	.03	.03	.18**	.61**					
9. T3 indirect aggression	.40**	.28**	.43**	.04	.00	.12**	.79**	.58**				
10. T3 internalizing problems (child report)	.03	.01	.04	.42**	.07*	.16**	.05	.05	.08**			

11. T3 internalizing problems (parent report)	.05	.04	.06	.09**	.55**	.09**	.02	.03	.04	.09**	
12. T4 victimization	.08*	.09**	.06	.09**	.09**	.18**	.05	.13**	.05	.14**	.11**

* $p < 0.05$.   ** $p < 0.01$.

Table 4

Standardized estimates one- and three factor model for T3 proactive and reactive aggression

| | 1-factor model | 3-factor model | | |
| | Aggression | Proactive aggression | Reactive aggression | Indirect aggression |
Items				
Threatens	.66** (0.02)	.70** (0.02)		
Encourages to harass	.79** (0.01)	.84** (0.01)		
Tries to dominate	.79** (0.01)	.84** (0.01)		
Intimidates	.72** (0.01)	.79** (0.01)		
Aggressive when teased	.63** (0.02)		.85** (0.01)	
Aggressive when contradicted	.66** (0.02)		.92** (0.01)	
Aggressive when something taken	.63** (0.02)		.87** (0.01)	
Gets others to dislike a person	.92** (0.01)			.94** (0.01)
Tells mean things behind back	.92** (0.01)			.94** (0.00)
Makes others exclude child	.90** (0.01)			.92** (0.01)
Fit statistics				
SRMR	0.10	0.03		
RMSEA	0.26	0.08		
CFI	0.75	0.98		
TLI	0.68	0.97		

Table 5

Path models (N = 1,126) (unstandardized coefficients, SE)

	Teacher-reported aggression	
	Model 1. Child-reported internalizing problems	Model 2. Parent-reported internalizing problems
T2 vic -> T3 proaggr	.04 (0.02)	.04 (0.02)
T2 vic -> T3 reaggr	.07** (0.02)	.07** (0.02)
T2 vic -> T3 indaggr	.04* (0.03)	.04* (0.02)
T2 vic -> T3 anxdep	.02** (0.02)	.01 (0.01)
T3 proaggr -> T4 vic	.04 (0.05)	.04 (0.05)
T3 reaggr -> T4 vic	.17** (0.04)	.16** (0.04)
T3 indaggr -> T4 vic	-.13 (0.07)	-.12 (0.07)
T3 anxdep -> T4 vic	.71** (0.17)	.24** (0.09)
T2 vic -> T4 vic		
Direct effect	.13** (0.03)	.14** (0.03)
Indirect effect	.02** (0.01)	.01* (0.01)
Total effect	.14** (0.03)	.15** (0.03)
Fit statistics		
RMSEA	0.06	0.06
CFI	0.97	0.97
TLI	0.91	0.91
SRMR	0.03	0.03

* $p < 0.05$; ** $p < 0.01$. Note. Vic = Victimization. Proaggr = Proactive aggression. Reaggr =

Reactive aggression. Indaggr = Indirect aggression. Anxdep = Anxiety and depression.

Models controlled for SES, parental conflict, sensation seeking, ADHD, and T1 internalizing

problems and aggression. 'Indirect effect' involves overall mediation effect through proaggr,

reaggr, indaggr, and anxdep.

Table 6

Gender-specific path models (unstandardized coefficients, SE)

	Teacher-reported aggression			
	Model 1. Child-reported internalizing problems		Model 2. Parent-reported internalizing problems	
	Girls	Boys	Girls	Boys
T2 vic -> T3 proaggr	.03 (0.03)	.05 (0.03)	.03 (0.03)	.05 (0.03)
T2 vic -> T3 reaggr	.06 (0.03)	.08* (0.03)	.06 (0.03)	.08* (0.03)
T2 vic -> T3 indaggr	.04 (0.03)	.04 (0.03)	.04 (0.03)	.04 (0.03)
T2 vic -> T3 anxdep	.02** (0.01)	.02* (0.01)	.02 (0.01)	.00 (0.01)
T3 proaggr -> T4 vic	.09 (0.07)	-.01 (0.07)	.10 (0.07)	-.01 (0.07)
T3 reaggr -> T4 vic	.14* (0.06)	.15* (0.07)	.15* (0.06)	.14* (0.07)
T3 indaggr -> T4 vic	-.17 (0.09)	-.03 (0.10)	-.19* (0.09)	-.02 (0.10)
T3 anxdep -> T4 vic	1.12** (0.22)	.50* (0.25)	.31** (0.12)	.20 (0.13)
T2 vic -> T4 vic				
Direct effect	.10* (0.04)	.14** (0.04)	.12** (0.04)	.15** (0.04)
Indirect effect	.03* (0.01)	.02* (0.01)	.01 (0.01)	.01 (0.01)
Total effect	.13** (0.04)	.16** (0.04)	.13** (0.04)	.16** (0.04)
Fit statistics				
SRMR	0.03	0.04	0.03	0.03
CD	0.45	0.47	0.55	0.54

$* p < 0.05$; $** p < 0.01$. Note. Vic = Victimization. Proaggr = Proactive aggression. Reaggr =

Reactive aggression. Indaggr = Indirect aggression. Anxdep = Anxiety and depression.

Models controlled for SES, parental conflict, sensation seeking, ADHD, and T1 internalizing

problems and aggression. 'Indirect effect' involves overall mediation effect through proaggr,

reaggr, indaggr, and anxdep.

Figure Captions.
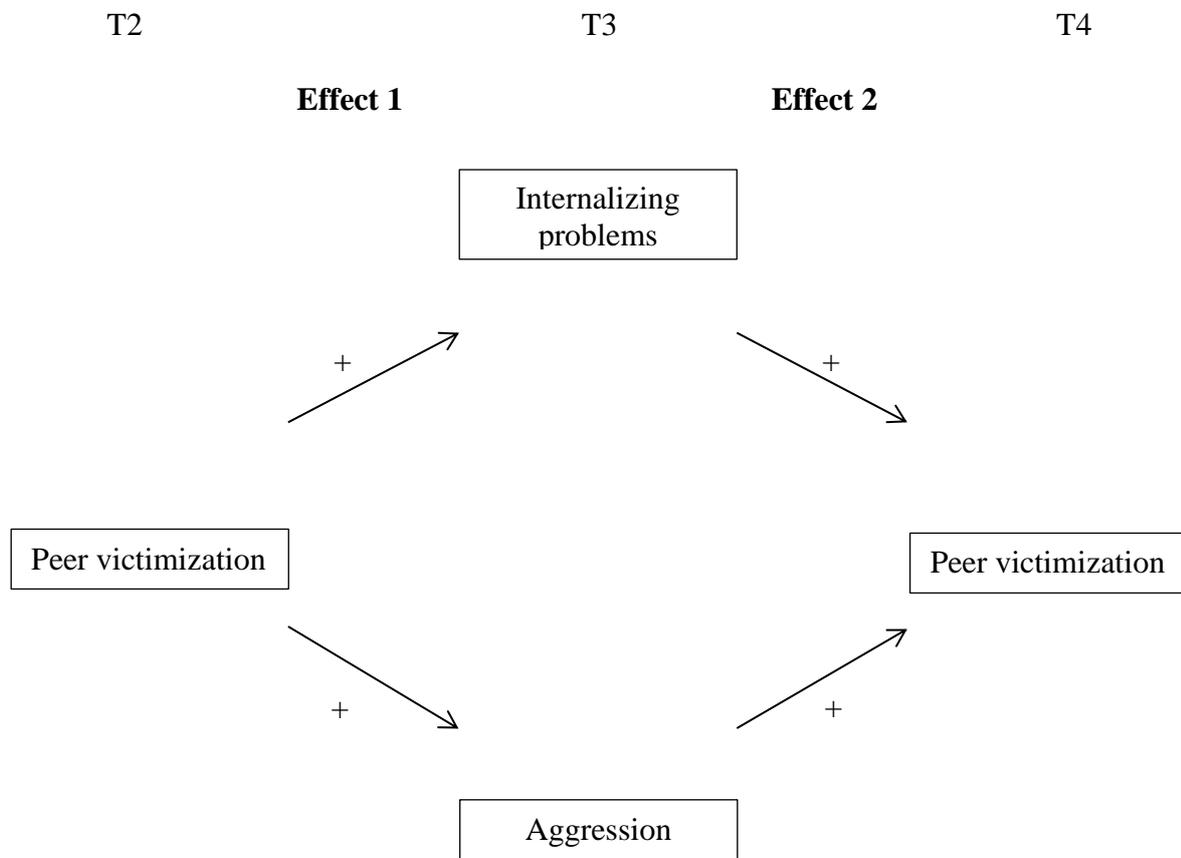
Figure 1.

Mediational model.

Note. Hypothesized effects are controlled for prior aggression, prior internalizing problems, ADHD, SES, parental conflict, and sensation seeking measured at T1.