Effects of the KiVa Anti-bullying Program on Adolescents' Depression, Anxiety, and Perception of Peers

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Abstract The present study investigated the effects of the KiVa antibullying program on students' anxiety, depression, and perception of peers in Grades 4–6. Furthermore, it was investigated whether reductions in peer-reported victimization predicted changes in these outcome variables. The study participants included 7,741 students from 78 schools who were randomly assigned to either intervention or control condition, and the program effects were tested with structural equation modeling. A cross-lagged panel model suggested that the KiVa program is effective for reducing students' internalizing problems and improving their peer-group perceptions. Finally, changes in anxiety, depression, and positive peer perceptions were found to be predicted by reductions in victimization. Implications of the findings and future directions for research are discussed.

Keywords Bullying · Prevention · KiVa · Program evaluation · Structural equation modeling

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Bullying is defined as repeated acts of aggression towards a victim who is weaker in regards to physical size, social status, or other factors (Merrell et al. 2008; Olweus 1991). A defining characteristic of bullying is the power differential that exists between the bully and the victim, which the bully effectively exploits. Olweus (2001) argues that victimization occurs when "a student…is exposed, repeatedly over time, to negative actions on the part of one or more other students" (p. 5-6). A key feature of peer victimization, its chronicity, suggests that the impact of being victimized may differ based on its duration; therefore youth are at greater risk for maladjustment the longer victimization persists (Kochenderfer-Ladd and Ladd 2001).

Research suggests that bullying and victimization are universal (Smith and Brain 2000) and relatively stable without intervention (Olweus 1978; Salmivalli et al. 1998). Bullying is also uniquely associated with maladjustment for both bullies (Coie and Dodge 1998; Feshbach 1970; Ladd 2005; Parke and Slaby 1983; Hawley et al. 2007) and victims (Card 2003; Card et al. 2007). Bullies are at a greater risk of engaging in substance abuse and delinquent behavior, usually perform poorly in the classroom, and may develop skewed social perceptions concerning the efficacy of aggressive behaviors used for problem-solving (Merrell et al. 2008).

Victims of bullying report significantly higher levels of internalizing problems, such as anxiety and depression, and lower levels of self-esteem and social competence than other children (Card et al. 2008; Haynie et al. 2001; Juvonen et al. 2003). Interestingly, children who exhibit higher rates of anxious or withdrawn behavior experience elevated risk for victimization (Paul and Cillessen 2003). In fact, withdrawn behavior in elementary school has been shown to increase peer rejection and victimization in junior high (Brock et al. 2006). Furthermore, victimization has been found to independently contribute to increasingly negative perceptions of peers. That is, the more children are victimized, the more they view peers as hostile, untrustworthy, and unsupportive (Salmivalli and Isaacs 2005). Paul and Cillessen (2003) suggest that the combination of anxious or withdrawn behavior and the absence of a peer support network may leave children vulnerable and defenseless, making them "easy targets for bullying" (p. 40). Importantly, these internalizing behaviors may serve not only as "risk factors for future victimization, but also a result of previous victimization, thus placing the child in a vicious cycle of victimization experiences from which it is difficult to escape" (p. 40).

School staff members, especially teachers, are vital in working to prevent and intervene in school bullying; however, school staff appears to rarely intervene. In fact, Craig et al. (2000) found that teachers intervened in bullying incidents only 15% to 18% of the time. A potential reason for this finding may simply be that the teachers do not know bullying is occurring. Reports have shown that approximately 50% of victims did not report being victimized to a parent or a teacher (Whitney and Smith 1993; Vernberg et al. 1995), and that approximately 30% of victims did not report their victimization experience to anyone (Smith and Shu 2000). When teachers are aware of victimization, often they do not identify victims as having significantly more internalizing problems than their non-victimized peers, despite the relatively high self-reports from the victims (Juvonen et al. 2003).

In light of this research, the need for bullying prevention and intervention is evident. Over the last 20 years, several school-wide bullying intervention and prevention programs have been developed, implemented, and evaluated (Smith et al. 2004). Many of these programs have been modeled after the Olweus Bullying Prevention Program (Olweus 1991). This program adopted a systemic, school-wide strategy that directed intervention curricula and activities toward the entire educational community (e.g. students, teachers, parents, and staff). Results of evaluation studies of the Olweus Bullying Prevention Program were encouraging. Victimization and bullying rates as well as other delinquent behaviors decreased dramatically (Olweus 1993). However, effectiveness studies of other programs subsequently have produced mixed results with most outcomes showing modest to no effect of the intervention (Baldry and Farrington 2004; Cross et al. 2004; Frey et al. 2005; O'Moore and Minton 2004; Pepler et al. 1994). Some have suggested that the contradictory findings are artifacts of methodological flaws, which suggest that more rigorous program evaluations are needed (Kärnä et al. 2011).

The purpose of the present study is to evaluate with rigorous methods an innovative anti-bullying program recently developed and tested in Finland called KiVa (Salmivalli et al. 2010). This program differs from previous interventions in both its scope and method. KiVa is predicated on the notion that bullying is a group process in which the bully behaves aggressively to attain a higher peer-group status and is continually reinforced by the apathy/encouragement of onlookers (Salmivalli et al. 1996). In order to gain power and status, bullies must display this behavior repeatedly in the presence of a group (Salmivalli 2010). High peer status is maintained, in part, due to displaying aggression toward peers, as evidenced in the longitudinal research of Juvonen et al. (2003). In addition, aggression toward peers has been evidenced to increase the bully's status over time (Cillessen and Borch 2006). Therefore, the aggressive child needs two things: a victim, or victims, whom they can victimize repeatedly without fear of being confronted, and witnesses who do not intervene.

Research has shown that many students are not only aware of peer victimization, but are also present during the bullying incidents (O'Connell et al. 1999; Salmivalli 1992) in which *participant roles* exist for most children (Salmivalli et al. 1996). Participant roles refer to the actions of peers or group members, other than the bully and victim, who are present during the bullying incident. In one study, a participant role could be assigned to over 85% of the peers present during a bullying incident (Salmivalli et al. 1996). Salmivalli et al. (1996) described the most common participant roles as assistants (those who physically help the bully), reinforcers (those who incite the bully), outsiders (those who do nothing or pretend to be unaware of the victimization), and defenders (those who confront the bully and help the victim).

The presence of peers has been positively related to the persistence of bullying episodes, commonly because peers are most likely to behave in ways that reinforce bullying behaviors (O'Connell et al. 1999). However, multiple studies have reported that anti-bullying attitudes and intentions clearly outweigh attitudes supporting bullying behavior for multiple age groups (Boulton et al. 1999; Menesini and Eslea 1997; Randall 1995; Rigby and Slee 1991; Salmivalli and Voeten 2004; Whitney and Smith 1993). Even though most students believe that bullying is wrong, they do not publicly express these beliefs. In actuality, many students act in ways that reinforce and

maintain the bullying by joining in, laughing, and/or gathering around during the time of the bullying incident (Salmivalli 2010). When peers do intervene, which is rare, bullying tends to stop abruptly (Hawkins et al. 2001). As such, the KiVa program's curricula is designed to educate students on the importance of peer involvement in stopping bullying as well as specific behavioral strategies to defend victims in such circumstances.

A recent study from the first phase of the KiVa evaluation suggests that the program is successful in reducing bullying and victimization in schools (Kärnä et al. 2011). The present study complements and extends previous findings regarding KiVa by focusing on outcome measures not previously evaluated and by using a different analytic approach. First, the well-substantiated link between victimization and internalizing problems (Brock et al. 2006; Card et al. 2008; Haynie et al. 2001; Juvonen et al. 2003; Paul and Cillessen 2003) led us to consider the impact that KiVa may have on outcomes such as depression and anxiety, given the significant reduction in victimization found in a previous investigation (Kärnä et al. 2011). Second, the program's emphasis on enhancing bystanders' abilities to support victimized peers suggests that KiVa may increase positive peer perceptions.

Furthermore, the present study extends previous research on KiVa by using structural equation modeling to address some of the limitations of multilevel modeling, the approach used by Kärnä et al. (2011). Although multilevel modeling is appropriate for clustered data, there are a few associated drawbacks. First, multilevel modeling cannot readily accommodate multiple indicators of study variables (e.g. perceptions, attitudes, affect) as it is based on a single reduced-form regression equation. Consequently, aggregate scale scores are used and contain measurement error. Second, the measurement process itself cannot be evaluated in order to determine whether measurement was similar for participants in the intervention and control conditions, as well as across time. Finally, model fit information is not provided.

Specifically, the present study addresses the following research questions: 1.) Are there mean level differences in the outcome measures between students receiving the intervention and those that are not?; and 2.) Can reductions in peer-reported victimization predict improvement in students' anxiety/depression levels as well as their peer perceptions? We predicted that the rate of change in the intervention condition would be greater than for the control condition. We also expected that the positive effects of KiVa would be reflected not only in a reduction of victimization but also in improvement in depression, anxiety, and peer perceptions. Specifically, we hypothesized that changes in victimization would predict corresponding changes in peer perceptions, depression, and anxiety.

Method

Participants

In the fall of 2006, letters describing KiVa were sent to 3,418 schools in Finland. The letter included information about the objectives of KiVa and an enrollment form. A total of 275 schools enrolled in the study, and 78 of them were stratified by province and language, and then randomly assigned to the intervention or control condition. Of these 78 schools, 429 classrooms from grades 3–5 (grades 4–6 during the implementation of KiVa) were included. A consent form was sent to parents of students in the participating schools. Excluding those who were not consented, the final sample size for the analyses was 7,741 students (3,685 in the control condition and 4,056 in the intervention condition). Of the respondents, 50.6% were girls and 49.4% were boys; the average age was 11.2 years ($SD=0.90$). Most students were native Finns (i.e. Caucasian), with the proportion of immigrants being 2.1%.

Procedure

Data were collected at three separate time points over the course of two academic years: in May 2007, December 2007/January 2008, and May 2008. At each wave of data collection, teachers administered online questionnaires to students during regular school hours. Teachers were provided with instructions for questionnaire administration approximately 2 weeks prior to data collection. Students completed the questionnaire during school hours in each school's computer lab. A definition of bullying as defined in Olweus's (1996) bully/victim questionnaire was provided at the beginning of the survey. Scale and item order were randomized to prevent any order effects (See Salmivalli et al. 2010 and Kärnä et al. 2011 for details on protocols).

The KiVa Program

KiVa includes 20 h of curricula designed to increase anti-bullying attitudes in classrooms as well as defending behaviors and self-efficacy among bystanders. Lessons involve activities such as class discussions, group work, short films about bullying, role-playing exercises, and a five-level interactive computer game. KiVa also includes an indicated intervention component that addresses identified cases of bullying. A team of three school staff members in each school works with the classroom teacher to resolve the issue through individual and group discussions with the victims and bullies. In these discussions, the victim also identifies friendly classmates and these classmates are then challenged to provide support for the victim. Additional details on the components of KiVa can be found in

Salmivalli et al. (2010) and at http://www.kivakoulu.fi (a link is provided at the top of the webpage to the site's English version).

Measures

Peer-Reported Victimization Victimization was measured via a peer-nomination process through which each student was nominated by their peers as either a victim or non-victim. Students were asked to respond to the following three items that relate to the victim role: "He/She is being pushed around and hit," "He/She is called names and mocked," "Nasty rumors are spread about him/her" (Kärnä et al. 2010). When presented with such items, students were also provided a list of their classmates and were asked to indicate as many of their peers that they think fit the item description. Students were allowed to make as many nominations as they felt were true, including none. The number of peer nominations for each student was totaled and a proportion was calculated by dividing the number of raw nominations received for each student by the number of students providing nominations within each classroom, resulting in a score ranging from 0.0 to 1.0 for each item. The present victimization scale has shown adequate internal consistency in a prior study (α=0.84; Kärnä et al. 2010). Data for this measure were collected at all three measurement occasions.

Perception of Peers Students were also asked to rate their beliefs about their peers in general. Student beliefs were measured using the Generalized Perception-of-Peers Questionnaire which is a 13-item scale that assesses the extent to which one's peers are considered supportive, kind, and trustworthy as opposed to unsupportive, hostile, and untrustworthy (Salmivalli et al. 2005). Students are provided statements such as "They can really be relied on," or "They are hostile," and asked to rate the accuracy of the statement on a Likert-scale ranging from 0 ("not true at all") to 4 ("exactly true"). Seven out of 13 were reverse-coded so that higher scores reflect more favorable views of one's social environment. Internal consistency of the scale items was adequate (α=0.89). Perception of peers was measured at the first and third measurement occasions only.

Depression Students' level of depression was measured by a 7-item scale derived from the Beck Depression Inventory (BDI; Beck et al. 1996). The BDI had been previously translated into Finnish and validated in two prior studies (Raitasalo 1977, 2007). Items were selected based on their suitability for use with children. Items regarding suicidal ideation and intent, sexual interest, and somatic complaints (e.g., losing appetite, losing weight, and being worried about one's health) were eliminated, resulting in a 7-item scale that assessed cognitive-affective concerns. The scale consisted of statements such as "What is your mood like?" and "How do you feel about yourself?", which were rated on a Likert-format response scale ranging from 0 (e.g., "fairly bright and good") to 4 (e.g., "I am so depressed and downcast that I cannot take it anymore"). While responding, the students were asked to describe their feelings in the last 2 weeks. Internal consistency for the 7 items was sufficient (α=0.89). Depression was measured at the first and third measurement occasions only.

Anxiety Two social anxiety scales, the Fear of Negative Evaluation and the Social Avoidance and Distress, were combined to measure students' level of anxiety (García-López et al. 2001). The 5-item Fear of Negative Evaluation Scale measures the extent to which others' evaluation of the respondent cause undue stress and worry (e.g., "I'm afraid the others won't like me"). The 4-item Social Avoidance and Distress Scale measures the extent to which the respondent avoids social interactions and feels uncomfortable in group situations (e.g., "I stay quiet when I'm in a group of people). Students rated each statement on a Likert-scale ranging from 0 ("not at all") to 4 ("all the time"). Preliminary analyses suggested that these nine items could be combined to form a single measure (Cronbach Alpha=0.88). Anxiety was measured at the first and third measurement occasions only.

Covariates Four covariates were also included in the analyses. Previous research has shown that gender and age are important predictors of bullying and victimization (Salmivalli and Voeten 2004). The language of classroom instruction (Finnish vs. Swedish) was also coded and entered into the models because Swedish schools were overrepresented in the sample. Finally, immigration status was entered into the models to control for any cultural effects.

Statistical Methods

All analyses were conducted in the software package *Mplus*, version 5.0 (Muthén and Muthén 2007). Structural equation modeling (SEM) was used to examine the data (Little 1997). SEM is a general data analytic framework that allows researchers to examine the relationships between hypothetical constructs. SEM is advantageous over traditional approaches (e.g. multiple regression) because measurement error is removed from the analysis variables, complex theoretical models can be specified and evaluated that cannot be handled by traditional approaches, and more information regarding the adequacy or fit of a proposed model is available.

Two structural equation models were evaluated to address our research questions. First, a multiple-group confirmatory factor analysis model (CFA) was used to examine mean differences on the outcome variables between the study conditions (Hypothesis 1). Chi-square difference tests were used to conduct these comparisons. Chi-square difference tests are used in SEM to determine whether constraints on certain model parameters are warranted. Specifically, the difference in model chi-square values between a constrained and unconstrained model is also distributed as a chi-square value, with degrees of freedom equal to the difference in degrees of freedom between models. Thus, this value can be used to test whether a significant loss in model fit was observed. For the present study, models were estimated in which a latent variable mean for an outcome was constrained to be equal between study conditions. If the constraint was not supported, then there was a statistically significant mean difference between the conditions. This approach to between-group comparisons is not often used but is preferable to traditional mean comparison tests (e.g. Student's t) because the variables are not contaminated with measurement error (Hancock 1997).

In additional to statistical tests, effect sizes for mean differences between conditions were calculated at each measurement occasion. Repeated measures (within-group) effects sizes were calculated as well. The following formula was used to calculate the effect sizes:

$$\text{Latent } d = \frac{\alpha_I - \alpha_C}{\left(\frac{n_I \psi_I + n_C \psi_C}{n_I + n_C}\right)}$$

This statistic, which we refer to as Latent d, is based on Cohen's d (Hancock 2001) where α_I and α_C represent the intervention and control condition latent means, respectively; n_I and n_C are the intervention and control group sample sizes; and ψ_I and ψ_C represent the variances of the latent variable for the intervention and control group. For the repeated measures effect sizes, ψ_I and ψ_C represent the latent variable variances at two different time points. Cohen's conventional effect size guidelines (1988) were used to determine whether an effect was small ($d<0.20$), medium ($0.20<d<0.50$), or large ($d>0.80$).

The second model tested was a multi-group cross-lagged panel model (Little et al. 2007) and was evaluated to determine if changes in victimization predicted changes in the other outcome variables (Hypothesis 2). Both models were evaluated according to the Comparative Fit Index (CFI, Bentler 1990), the Root Mean Error of Approximation (RMSEA, Steiger and Lind 1980), the Tucker-Lewis Index (TLI, Tucker and Lewis 1973), and the Standardized Root Mean Square Residual (SRMR, Bentler 1995). Values of .95 or higher for the CFI and TLI, lower than .06 for the RMSEA, and lower than .08 for the SRMR are indicative of acceptable model fit according to conventional cutoff criteria (Hu and Bentler 1999).

Parcels were used instead of individual scale items. Parcels have several psychometric advantages over item-level data such as higher reliabilities, a lower likelihood of violating distributional assumptions, and more precise scale intervals (Little et al. 2002). Parcels were created by averaging the items assigned to a given parcel. Information on the items that made up each parcel can be found in Table 1. Due to the hierarchical structure of the data—students were grouped within classrooms, which were grouped within schools—a normal theory maximum likelihood estimator was used that corrects standard errors and the model chi-square values for data clustering. However, initial analyses revealed that the intraclass correlation coefficient (ICC) was less than .05 for all items and parcels used in our analyses, and thus any parameter bias was expected to be negligible (Julian 2001).

The percentage of missing data was low for all variables with the exception of schools in the control condition at the third measurement occasion (for additional information, see http://www.kivakoulu.fi/english). Multiple imputation (Enders 2010) was used in the present study to handle missing data by using the SAS Proc MI utility. Dummy-coded variables pertaining to classrooms and cross-classification of classrooms, as well as the interactions of these variables with all other study variables, were included in the program to inform the imputations. The MCMC algorithm was used to generate 100 imputed datasets used for analyses. Details concerning the percentage of missing data, as well as common missing data patterns in the dataset, are described extensively elsewhere (cf. Kärnä et al. 2011; Appendix A).

Results

Preliminary analyses were conducted to evaluate the factorial invariance of the outcome measures. Factorial invariance refers to the comparability of psychological measurement across different groups of people (Meredith 1993). For the present study, factorial invariance was supported and thus participants were being measured similarly between conditions and across time. However, some latent variable relationships and variances differed between conditions, and thus a multiple-group modeling strategy—that is, freely estimating latent variable parameters in each group—was maintained for subsequent models.

Mean Comparisons

The CFA model used to test for mean differences fit the data well (χ^2 (494)=4100.897, p=<0.01, RMSEA=0.043

Table 1 Items used in parcels

Factor	Parcel	Content	Prompt/Scale Format
Perception of Peers	Parcel 1	"Shouldn't be trusted too much"[a]	How do you consider your mates of the same age?
		"Don't really care about me" [a]	When responding don´t think of your best friends only, but tell us your impression in general. They..
		"Only think about their own interest" [a]	
		"Betray one's trust whenever they get the chance" [a]	
		"Want to hurt me"[a]	0 = Not at all; 4 = Exactly True
		"Think bad things about me" [a]	
		"Are hostile" [a]	
	Parcel 2	"Can really be relied on"	How do you consider your mates of the same age?
		"Really care about what happens to me"	When responding don´t think of your best friends only, but tell us your impression in general. They..
		"Are there for me whenever I need help"	
		"Can be confided in"	
		"Are honest with me"	0 = Not at all; 4 = Exactly True
		"Usually have good intentions"	
Depression	Parcel 1	"How was your mood (describe your mood)?" [a]	0 = So depressed I cannot stand; 4 = Sunny & good
		"Do you feel senses of disappointment?" [a]	0 = Hate myself; 4 = Satisfied
		"How satisfied do you feel about yourself?" [a]	0 = Completely unhappy; 4 = Quite happy
	Parcel 2	"How do you see the future?" [a]	0 = Desperate; 4 = Face Optimistically
		"How do you see yourself?" [a]	0 = Worthless and bad; 4 = Quite Good
	Parcel 3	"How do you feel your life has been running?" [a]	0 = Completely failed; 4 = Succeeded often
		"How do you feel about your appearance?" [a]	0 = Ugly; 4=Satisfied
Anxiety	Parcel 1	"I'm afraid of asking others to do things with me as they might turn me down"	0 = Not at all; 4 = Exactly True
		"I'm worried about what the others say about me"	
		"If I have to argue about something, I'm afraid that the others won't like me"	
	Parcel 2	"It's difficult for me to ask others to do things with me"	0 = Not at all; 4 = Exactly True
		"I feel quite shy even among those mates I know well"	
		"I'm afraid the others won't like me"	
	Parcel 3	"I stay quiet when I'm in a group of people"	0 = Not at all; 4 = Exactly True
		"I'm worried that the others don't like me"	
		"I'm worried about what the others think of me"	

[a] indicates that the item was reverse-coded

(90% C.I. = 0.042 - 0.045), CFI=0.969, TLI=0.962, SRMR=0.039). Effect sizes for between-condition mean comparisons can be found in Table 2. The intervention and control conditions were statistically equal on peer-reported victimization at wave 1 ($\Delta\chi^2$ (1)=0.19, p=0.66).

Table 2 Between condition effect sizes

Factor	W1	W2	W3
Peer-reported Victimization	0.13	−1.08	−2.19
Perception of Peers	0.04	–	0.20
Depression	0.02	–	-0.09
Anxiety	-0.03	–	-0.13

W1 Wave 1, *W2* Wave 2; *W3* Wave 3

A small effect size (d=0.13) indicated that more victimization occurred in the intervention group at baseline. However, students in the intervention condition reported significantly less victimization at wave 2 ($\Delta\chi^2$ (1)=13.68, p<0.01) and wave 3 ($\Delta\chi^2$ (1)=57.11, p<0.01). The effect sizes for these differences were -1.08 at wave 2 and d=-2.19 at wave 3. This suggests that students in the intervention condition reported less victimization as compared to the control condition over the course of the study.

Somewhat similar patterns were found for the other three outcome variables. Students' positive peer perceptions actually decreased in both conditions, but the decrease was less dramatic in the intervention condition. Specifically, both conditions' peer ratings were equal at wave 1 (d=0.04; $\Delta\chi^2$ (1)=0.56, p=0.46) but significantly different at wave 3

(d=0.20; $\Delta\chi^2$ (1)=5.50, p=0.02). Likewise, mean depression levels increased less dramatically for the intervention conditions as compared to the control condition. However, this effect failed to reach statistical significance. The conditions reported equal levels of depression at wave 1 (d=0.02; $\Delta\chi^2$ (1)=0.07, p=0.80) and at wave 3 (d=-0.09; $\Delta\chi^2$ (1)=2.98, p=0.08). Finally, anxiety showed decreases in both conditions over time, though a larger decrease was reported for those receiving the intervention. The conditions reported equal levels of anxiety at wave 1 (d=-0.03; $\Delta\chi^2$ (1)=1.27, p=0.26) but not at wave 3 (d=-0.13; $\Delta\chi^2$ (1)=21.84, p<0.01).

Structural Relations

A multiple-group, cross-lagged panel model (Little et al. 2007) was evaluated to determine whether reductions in bullying and victimization positively influenced other important areas of students' well-being, and whether such effects differed between the study conditions. A path diagram of the model is shown in Fig. 1. Autoregressive paths and within-time correlations were freely estimated, as well as the regressions of all study variables onto the four covariates. It is important to note that any variable regressed onto itself at an earlier time point represents change in that variable. The three outcomes of interest at wave 3 were regressed onto the victimization construct at waves 1 and 2. We hypothesized that changes in victimization (represented by peer-reported victimization at wave 2) would predict corresponding changes in peer perceptions, depression, and anxiety (represented at wave 3).

After estimating a model in which all latent correlations and path coefficients were freely estimated for each condition, individual estimates were tested for equality across conditions according to the chi-square difference test. Estimates that were found to be statistically equal were equated and a final model was estimated (Fig. 1). This model demonstrated acceptable model fit (χ^2 (634)=4632.52, p=<0.01, RMSEA=0.048 (90% C.I. = 0.047–.049), CFI=0.951, TLI=0.951, SRMR= 0.041). Standardized regression coefficients of the latent variables can be found in Fig. 1. All relationships between variables were significantly different from zero. Of particular interest are the cross-lagged paths emitting from peer-reported victimization at wave 2 to all other variables at the third time point. Specifically, reductions in victimization over time resulted in increases in students' positive peer evaluations (β=-0.18). That is, greater decreases in victimization led to more favorable views of the peer context. Reductions in victimization also resulted in lower depression levels (β=0.09). Finally, reductions in victimization over time predicted subsequent reductions in anxiety (β=0.12 for the intervention condition; β=0.06 for the control condition).

Effects of the covariates on all of the latent variables via Wald tests can be found in Table 3. Of particular interest are potential gender differences in depression and anxiety among the groups. Gender differences have been well established in the literature for depression (Essau et al. 2010) and anxiety (McLean et al. in press). For the control

Fig. 1 Path diagram of the cross-lagged panel model. This model suggests that changes in peer-reported victimization predict subsequent changes in one's peer perceptions, depression levels, and anxiety levels. All estimates were significantly different from zero at the .05 level
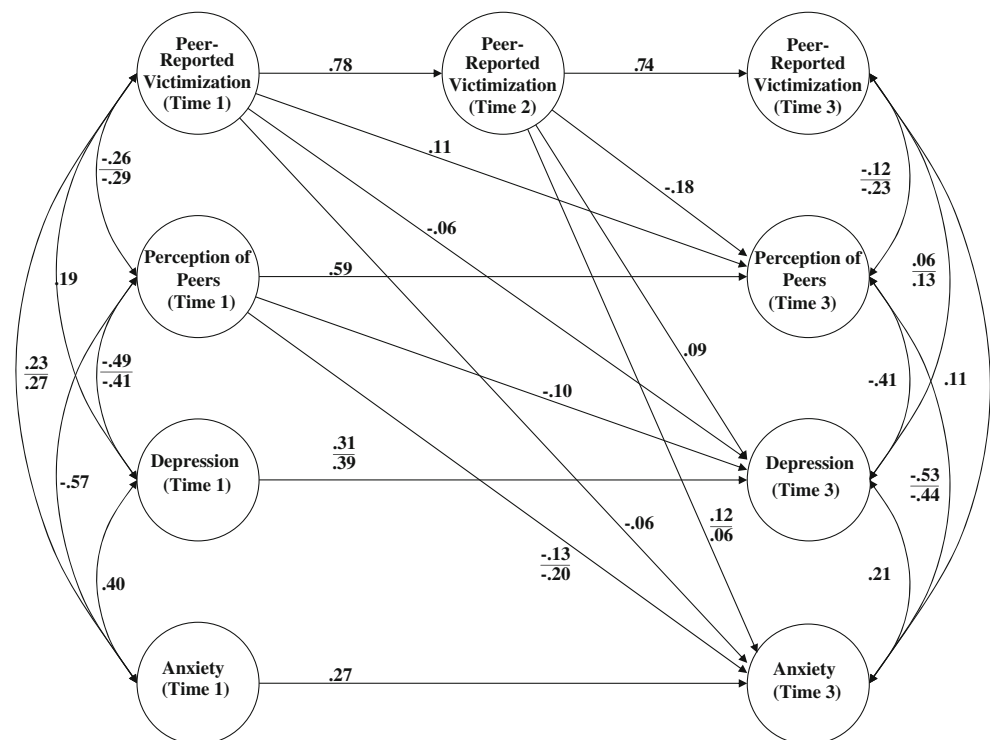
Table 3 Standardized regression coefficients for cross-lagged panel model

Covariate	Dependent Variable	Intervention condition			Control condition		
		β	S.E.	p	β	S.E.	p
Gender (1=male)	Peer-reported Victimization (wave 1)	0.08*	0.02	< 0.01	0.09*	0.02	< 0.01
	Peer-reported Victimization (wave 2)	0.01	0.01	0.35	0.01	0.01	0.22
	Peer-reported Victimization (wave 3)	-0.01	0.01	0.28	-0.03*	0.01	0.02
	Perception of Peers (wave 1)	-0.02	0.02	0.26	-0.05*	0.02	< 0.01
	Perception of Peers (wave 3)	-0.12*	0.02	< 0.01	-0.15*	0.02	< 0.01
	Depression (wave 1)	-0.03	0.02	0.13	-0.07*	0.02	< 0.01
	Depression (wave 3)	0.00	0.02	0.80	0.02	0.02	0.29
	Anxiety (wave 1)	-0.12*	0.02	< 0.01	-0.14*	0.02	< 0.01
	Anxiety (wave 3)	-0.08*	0.02	< 0.01	-0.09*	0.02	< 0.01
Age	Peer-reported Victimization (wave 1)	0.04	0.04	0.27	-0.08*	0.04	0.03
	Peer-reported Victimization (wave 2)	0.08*	0.02	< 0.01	0.00	0.03	0.94
	Peer-reported Victimization (wave 3)	-0.03	0.03	0.30	-0.02	0.03	0.62
	Perception of Peers (wave 1)	0.02	0.05	0.73	0.02	0.05	0.62
	Perception of Peers (wave 3)	-0.10	0.05	0.08	-0.02	0.05	0.67
	Depression (wave 1)	0.07	0.04	0.10	0.03	0.04	0.53
	Depression (wave 3)	0.07	0.04	0.09	0.07	0.04	0.07
	Anxiety (wave 1)	0.03	0.04	0.54	-0.09*	0.04	0.03
	Anxiety (wave 3)	0.05	0.04	0.19	-0.01	0.04	0.72
Swedish (1 = Swedish)	Peer-reported Victimization (wave 1)	0.09*	0.02	< 0.01	0.04*	0.02	0.02
	Peer-reported Victimization (wave 2)	-0.02	0.03	0.49	0.01	0.01	0.64
	Peer-reported Victimization (wave 3)	0.03*	0.01	< 0.01	0.03*	0.01	0.02
	Perception of Peers (wave 1)	-0.06*	0.02	< 0.01	-0.02	0.02	0.25
	Perception of Peers (wave 3)	0.02	0.02	0.49	0.00	0.02	0.92
	Depression (wave 1)	-0.01	0.02	0.58	-0.00	0.02	0.95
	Depression (wave 3)	-0.01	0.02	0.70	-0.01	0.02	0.76
	Anxiety (wave 1)	0.04*	0.02	0.03	0.01	0.02	0.42
	Anxiety (wave 3)	-0.19	0.02	0.23	0.03*	0.02	0.05
Immigrant (1 = immigrant)	Peer-reported Victimization (wave 1)	-0.03	0.04	0.48	0.09*	0.04	0.03
	Peer-reported Victimization (wave 2)	-0.01	0.03	0.85	0.01	0.03	0.84
	Peer-reported Victimization (wave 3)	0.07*	0.03	0.02	-0.01	0.03	0.76
	Perception of Peers (wave 1)	0.00	0.05	0.93	-0.08	0.05	0.07
	Perception of Peers (wave 3)	0.01	0.05	0.93	0.00	0.05	0.95
	Depression (wave 1)	-0.01	0.04	0.88	0.03	0.04	0.52
	Depression (wave 3)	-0.05	0.04	0.22	-0.05	0.04	0.15
	Anxiety (wave 1)	-0.12*	0.04	< 0.01	0.04	0.04	0.40
	Anxiety (wave 3)	-0.02	0.04	0.70	-0.01	0.04	0.72

β = Standardized regression coefficient; S.E. = Standard error; p = probability of result given a null distribution

* = Coefficient statistically significant from zero at 0.05 alpha level

group, there was a significant difference in anxiety at baseline, with boys reporting less anxiety (β=-0.12; p<0.01) as compared to girls, but no gender difference for depression. At time 3, again only anxiety differed between boys and girls (β=-0.08; p<0.01), with boys again reporting less anxiety as compared to girls. For the intervention group at time 1, boys reported less depression (β=-0.07; p<0.01) and less anxiety (β=-0.14; p<0.01). At

time 3, boys reported less anxiety (β=-0.09; p<0.01), but no difference was found for depression.

Discussion

The present study complemented and extended prior research on KiVa by using a sophisticated analytic approach

and evaluating the program's impact on outcome measures not previously assessed. Our results reaffirmed the findings of Kärnä et al (2011), thus suggesting KiVa was effective in reducing victimization in designated classrooms. In the present study, rates of victimization remained stable in the control condition over time, whereas victimization declined significantly among intervention participants. The mechanism for KiVa's success is most likely related to its emphasis on explicitly addressing the core components of bullying behavior; that is, the power differential that exists between a bully and his/her victim and the social context in which the behavior is reinforced and maintained over time (Salmivalli et al. 2010). Furthermore, the reduction in victimization among intervention participants may also be the result of the program's attempt to change the social climate of the classroom to the point where bullying is unacceptable and in contradiction to shared values of cooperation and support.

In addition to instances of victimization, the results of this investigation suggest that KiVa may also positively influence students' levels of anxiety and perceptions of their peer climate. Levels of anxiety among intervention participants declined at a faster rate as compared to students in the control condition. As seen in Fig. 1, it is likely that the significant reductions in victimization resulted in improvements in anxiety levels. Research suggests that victimization predicts intrapersonal problems (Brock et al. 2006; Card et al. 2008; Haynie et al. 2001; Juvonen et al. 2003; Paul and Cillessen 2003). Once victimization is alleviated, former victims may feel better about themselves and about participating in social interactions. Therefore, social anxiety may be reduced because the fear of being victimized has diminished. It is also possible that the programmatic components of KiVa may uniquely improve students' level of anxiety beyond the effects of reduced victimization. Many activities during the classroom-based lessons encourage positive social interactions, self-confidence, interpersonal self-efficacy, and resisting peer pressure. Participating in these activities may decrease social anxiety as students feel more socially competent and less fearful of negative evaluation by peers.

Interestingly, peer perceptions became more negative in both conditions. However, students in the control condition reported less favorable views of their peers than students in KiVa. It is likely that the decline in peer perceptions found in both conditions represents a developmental change. Research shows that peer relationships are constantly changing and become increasingly intense and complex as children age (Brown 2004). In fact, evidence suggests that friendship groups rarely remain intact for longer than 12 months in duration (Brown 2004). The rapid shift in social networks may leave children feeling less secure in their relationships with their peers. Consequently, this may

lead to less trust among peers resulting in a decline in peer perceptions. Finally, although students involved in KiVa reported less depression than students in the control schools, the difference was not significant statistically.

Gender differences in depression and anxiety are well-established (i.e., Essau et al. 2010; McLean et al. in press) and therefore particularly relevant to the present study. At time 1, findings correspond to the literature as girls reported significantly higher levels of anxiety in both groups and depression in the intervention group. By the end of the study, girls also reported significantly higher levels of anxiety in both the intervention and control groups, similar to findings from prior studies (i.e., McLean et al. in press). Interestingly, there were no longer differences in depression between boys and girls in either group by time 3. Given that the gender differences in depression become more pronounced around puberty, with the greatest increases arising between the ages of 15 and 18 (Essau et al. 2010), it is possible that the sample in the present study is too young to evidence significant differences in depression. It is also possible, and perhaps more likely, that the modified version of the BDI that was translated into Finnish did not adequately capture depression for this sample.

Overall, students in KiVa evidenced more positive outcomes over time as compared to controls. Therefore, these findings suggest that KiVa was able to retard negative developmental changes associated with bullying such as increases in distrust of their peers. Additionally, positive developmental change observed in both study conditions (reductions in anxiety) was accelerated for students receiving KiVa.

Strengths and Limitations of the Present Study

Several limitations exist in the present study. First, the forms of victimization were not analyzed separately in the current analysis. Relational and overt victimization may relate differently to internalizing problems, and these relationships may be moderated by gender. Vuijk and colleagues found that the relationships between forms of victimization, anxiety and depression were moderated by gender among a sample of youth in the Netherlands. Reductions in relational victimization for girls moderated rates of depression and anxiety, whereas reductions in physical victimization predicted reductions in the same outcomes for boys (Vuijk et al. 2007). Although gender effects were evaluated in the current study, these were for a general victimization construct and not its respective forms. Therefore, future investigations of KiVa must examine gender as a potential moderator of the relationship between the form of victimization and internalizing problems, such as depression and anxiety, as well as analyze the forms of victimization separately. Second, the outcome measures were evaluated at the first and third occasion of measure-

ment. This lag (one full school year) precludes a more detailed analysis of the short-term development of the outcomes of interest. Lastly, the modified version of the BDI may not have been an adequate measure of depression, which may have resulted in the lack of gender differences found over time for both conditions.

The strengths of this investigation, however, offset the limitations. First and foremost, the present study further substantiates prior evidence supporting KiVa's ability to reduce victimization among intervention participants by employing structural equation modeling. The use of SEM is certainly a strength as it allowed us to establish measurement invariance across the intervention and control conditions, model error-free latent variables via multiple indicators, and assess model fit information to test the complex relationships among treatment effects and student outcomes of interest. Furthermore, the longitudinal structure of the data allowed us to establish temporal precedence and thus further support the assertion that reductions in victimization such as those seen in KiVa-participating schools can achieve positive changes in other areas of student well-being.

Implications and Directions for Future Research

The significant social and individual consequences of peer victimization on youths' development demand new and innovative prevention and intervention strategies. The results of this investigation suggest that KiVa may extend previous anti-bullying prevention approaches by appropriately addressing the complex interactions between bullies and their victims and the underlying social context in which the interactions occur. KiVa appears to be an effective prevention approach to reduce victimization and positively impact other key outcomes for victims of bullying, such as anxiety and negative perceptions of peers. (See Salmivalli et al. 2010 for how the program can be practically implemented in schools).

Although the results from this investigation as well as prior research on the program indicate KiVa is an efficacious strategy to impact bullying and the social environment in which it occurs, other key questions about the program's impact remain. A critical direction for prevention science is to understand the mechanisms for how interventions work by identifying key characteristics of students who respond most and least to intervention strategies. This is an important direction for KiVa so that appropriate modifications to program's delivery can be made as to maximize the program's impact.

Furthermore, many anti-bullying programs have been developed, but have achieved only modest effects on reducing bullying and victimization. Meta-analytic reviews of longitudinal tests of anti-bullying programs have shown that programs with multiple intervention components are

most effective in reducing violence among children and youth (e.g., Hahn et al. 2007; Farrington and Ttofi 2009; Ttofi et al. 2008; Wilson et al. 2003; Wilson and Lipsey 2007). KiVa combines several key intervention strategies aimed at developing skills among students and teachers as well as enhancing the classroom and school climate. The question remains, however, whether the unique programmatic features of KiVa (e.g., the emphasis on the role of the bystander and social context of bullying and the combination of universal and indicated actions to address bullying) achieve a greater effect on key outcomes as compared to other anti-bullying programs. An important direction for future research will be to examine and compare effect sizes for KiVa to other bullying prevention programs.

Conclusion

The present study substantiates and extends prior findings on KiVa. Specifically, the results suggest that KiVa reduced victimization in intervention schools, and may be an effective strategy for retarding negative developmental changes associated with bullying and accelerating positive development. KiVa's systematic focus on the extended social context in which bullying takes place in combination with its intentional emphasis on the core components of bullying appears to extend prior prevention efforts and to be an appropriate strategy for reducing victimization. Questions remain, however, about the mechanisms by which the intervention impacts particular students and whether KiVa, through these mechanisms, achieves greater effects than other prevention strategies—questions that will be addressed in future research.

Notably, KiVa represents an important innovation in the field of bullying prevention that has demonstrated positive effects consistently across several intervention studies (Kärnä et al. 2011; Salmivalli, Garandeau, & Veenstra, under review; Salmivalli, Kärnä, & Poskiparta, under review). Furthermore, the assessment of KiVa's impact in these studies utilizes advanced analytic methods that address the limitations of previous evaluation studies. The programmatic and methodological sophistication represented by KiVa studies contribute significantly to the field of prevention science and to international anti-bullying efforts.

References

Baldry, A., & Farrington, D. (2004). Evaluation of an intervention program for the reduction of bullying and victimization in schools. Aggressive Behavior, 30, 1–15.
Beck, A., Steer, R., & Brown, G. (1996). Beck depression inventory. San Antonio: The Psychological Corporation.
Bentler, P. (1990). Comparative fit indexes in structural models. Psychological Bulletin, 107, 238–246.

Bentler, P. (1995). *EQS structural equations program manual*. Encino: Multivariate Software.

Boulton, M. J., Bucci, E., & Hawker, D. D. S. (1999). Swedish and English secondary school pupils' attitudes towards, and conceptions of, bullying: concurrent links with bully/victim involvement. *Scandinavian Journal of Psychology, 40*, 277–284.

Brock, S. E., Nickerson, A. B., O'Malley, M. D., & Chang, Y. (2006). Understanding children victimized by their peers. *Journal of School Violence, 5*, 3–18.

Brown, B. (2004). Adolescents' relationships with peers. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (2nd ed., pp. 363–394). Hoboken: Wiley.

Card, N. A. (2003). Victims of peer aggression: A meta-analytic review. In N. A. Card & A. Nishina (Eds.), *Whipping boys and other victims of peer aggression: 25 years of research, now where do we go?* Tampa: Poster symposium presented at the biennial meeting of the Society for Research in Child Development.

Card, N. A., Isaacs, J., & Hodges, E. V. E. (2007). Correlates of school victimization: recommendations for prevention and intervention. In J. E. Zins, M. J. Elias, & C. A. Maher (Eds.), *Bullying, victimization, and peer harassment: A handbook of prevention* (pp. 339–366). New York: Haworth.

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, 791*, 1185–1229.

Cillessen, A. H. N., & Borch, C. (2006). Developmental trajectories of adolescent popularity: a growth curve modelling analysis. *Journal of Adolescence, 29*, 935–959.

Coie, J. D., & Dodge, K. A. (1998). Aggression and antisocial behavior. In W. Damon & N. Eisenberg (Eds.), *Handbook of child psychology* (Vol. 3, pp. 779–862). New York: Wiley.

Craig, W. M., Pepler, D. J., & Atlas, R. (2000). Observations of bullying on the playground and in the classroom. *International Journal of School Psychology, 21*, 22–36.

Cross, D., Hall, M., Hamilton, G., Pintabona, Y., & Erceg, E. (2004). Australia: The friendly schools project. In P. K. Smith, D. Pepler, & K. Rigby (Eds.), *Bullying in schools: How successful can interventions be?* (pp. 187–210). New York: Cambridge University Press.

Enders, C. K. (2010). *Applied missing data analysis*. New York: Guildford.

Essau, C. A., Lewinsohn, P. M., Seeley, J. R., & Sasagawa, S. (2010). Gender differences in the developmental course of depression. *Journal of Affective Disorders, 127*, 185–190.

Farrington, D. P., &Ttofi, M. M. (2009). School-based programs to reduce bullying and victimization. *Campbell Systematic Reviews*, 6.

Feshbach, S. (1970). Aggression. In P. H. Mussen (Ed.), *Carmichael's manual of child psychology* (Vol. 2, pp. 159–259). New York: Wiley.

Frey, K. S., Hirschstein, M. K., Snell, J. L., Edstrom, L. V., MacKenzie, E. P., & Broderick, C. J. (2005). Reducing playground bullying and supporting beliefs: an experimental trial of the Steps to Respect program. *Developmental Psychology, 41*, 479–491.

García-López, L., Olivares, J., Hidalgo, M., Beidel, D., & Turner, S. (2001). Psychometric properties of the social phobia and anxiety inventory, the social anxiety scale for adolescents, the fear of negative evaluation scale, and the social avoidance and distress scale in an adolescent Spanish-speaking sample. *Journal of Psychopathology and behavioral assessment, 23*, 51–59.

Hahn, R., Fuqua-Whitley, D., Wethington, H., Lowy, J., Crosby, A., Fullilove, M., et al. (2007). Effectiveness of universal school-based programs to prevent violent and aggressive behavior. *American Journal Preventive Medicine, 33*, S114–S129.

Hancock, G. R. (1997). Structural equation modeling methods of hypothesis testing of latent variable means. *Measurement and Evaluation in Counseling and Development, 30*, 91–105.

Hancock, G. R. (2001). Effect size, power, and sample size determination for structured means modeling and MIMIC approaches to between-groups hypothesis testing of means on a single latent construct. *Psychometrika, 66*, 373–388.

Hawkins, D. L., Pepler, D. J., & Craig, W. M. (2001). Naturalistic observations of peer interventions in bullying. *Social Development, 10*, 512–527.

Hawley, P. H., Little, T. D., & Rodkin, P. C. (Eds.). (2007). *Aggression and adaptation*. Mahwah: Erlbaum.

Haynie, D. L., Nansel, T., Eitel, P., Crump, A. D., Saylor, K., Yu, K., et al. (2001). Bullies, victims, and bully/victims: distinct groups of at-risk youth. *Journal of Early Adolescence, 21*, 29–49.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1–55.

Julian, M. W. (2001). The consequences of ignoring multilevel data structures in nonhierarchical covariance modeling. *Structural Equation Modeling, 8*, 325–352.

Juvonen, J., Graham, S., & Shuster, M. A. (2003). Bullying among young adolescents: the strong, the weak, and the troubled. *Pediatrics, 112*, 1231–1237.

Kärnä, A., Voeten, M., Little, T. D., Poskiparta, E., Kaljonen, A., & Salmivalli, C. (2011). A large-scale evaluation of the KiVa antibullying program: grades 4–6. *Child Development, 82*, 311–330.

Kärnä, A., Voeten, M., Poskiparta, E., & Salmivalli, C. (2010). Vulnerable children in varying classroom contexts: bystanders' behaviors moderate the effects of risk factors on victimization. *Merrill-Palmer Quarterly, 56*, 261–282.

Kochenderfer-Ladd, B., & Ladd, G. W. (2001). Variations in peer victimization: Relations to children's maladjustment. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized* (pp. 25–48). New York: Guilford.

Ladd, G. W. (2005). *Children's peer relations and social competence: A century of progress*. New Haven: Yale University Press.

Little, T. (1997). Mean and covariance structures (MACS) analyses of cross-cultural data: Practical and theoretical issues. *Multivariate Behavioral Research, 32*, 53–76.

Little, T., Cunningham, W., Shahar, G., & Widaman, K. (2002). To parcel or not to parcel: exploring the question, weighing the merits. *Structural Equation Modeling, 9*, 151–173.

Little, T. D., Preacher, K. J., Selig, J. P., & Card, N. A. (2007). New developments in latent variable panel analysis of longitudinal data. *International Journal of Behavior Development, 31*, 357–365.

McLean, C. P., Asnaani, A., Litz, B. T., & Hofmann, S. G. (in press). Gender differences in anxiety disorders: prevalence, course of illness, comorbidity, and burden of illness. *Journal of Psychiatric Research, XX*, 1–9.

Menesini, E., & Eslea, M. (1997). Cross-national comparison of children's attitudes towards bully/victim problems in school. *Aggressive Behavior, 23*, 245–257.

Meredith, W. (1993). Measurement invariance, factor analysis and factorial invariance. *Psychometrika, 58*, 525–543.

Merrell, K., Gueldner, B., Ross, S., & Isava, D. (2008). How effective are school bullying intervention programs? A meta-analysis of intervention research. *School Psychology Quarterly, 23*, 26–42.

Muthén, L., & Muthén, B. (2007). *Mplus version 5*. Los Angeles: Muthén & Muthén.

O'Connell, P., Pepler, D. J., & Craig, W. (1999). Understanding bullying from a dynamic systems perspective. In A. Slater & D. Muir (Eds.), *The Blackwell reader in developmental psychology* (pp. 440–451). Oxford: Blackwell.

O'Moore, A., & Minton, S. (2004). Ireland: The Donegal primary schools anti-bullying project. In P. K. Smith, D. Pepler, & K. Rigby (Eds.), *Bullying in schools: How successful can interventions be* (pp. 275–287). New York: Cambridge University Press.

Olweus, D. (1978). *Aggression in the schools: Bullies and whipping boys*. New York: Hemisphere.

Olweus, D. (1991). Bully/victim problems among school children: Basic facts and effects of a school based intervention program. In D. J. Pepler & K. H. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 411–448). Hillsdale: Erlbaum.

Olweus, D. (1993). *Bullying at school*. Cambridge: Blackwell.

Olweus, D. (2001). Peer harassment: A critical analysis and some important issues. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized* (pp. 5–20). New York: Guilford.

Olweus, D. (1996). *The revised Olweus bully/victim questionnaire for students*. Bergen: University of Bergen.

Parke, R., & Slaby, R. (1983). The development of aggression. In P. Mussen (Ed.), *Handbook of child psychology* (Vol. IV, pp. 547–621). New York: Wiley.

Paul, & Cillessen. (2003). Dynamics of peer victimization in early adolescence: results from a four-year longitudinal study. *Journal of Applied School Psychology, 19*, 25–43.

Pepler, D., Craig, W., Ziegler, S., & Charach, A. (1994). An evaluation of an anti-bullying intervention in Toronto schools. *Canadian Journal of Community Mental Health, 13*, 95–110.

Raitasalo, R. (1977). *Depressiojasenyhteyspsykoterapiantarpeeseen*. Helsinki: Kansaneläkelaitoksenjulkaisuja A: 13.

Raitasalo, R. (2007). *Mood questionnaire. Finnish modification of the short form of the Beck Depression Inventory measuring depression symptoms and self-esteem* (p. 86). Helsinki: The Social Insurance Institution, Finland, Studies in Social Security and Health.

Randall, P. (1995). A factor study on the attitudes of children to bullying. *Association of Educational Psychologists Journal, 11*, 22–26.

Rigby, K., & Slee, P. (1991). Bullying among Australian school children: reported behavior and attitudes toward victims. *Journal of Social Psychology, 131*, 615–627.

Salmivalli, C. (1992). *Bullying as a group process*. Unpublished master's thesis, Department of Psychology, University of Turku, Turku, Finland.

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., Kärnä, A., & Poskiparta, E. (2010). From peer putdowns to peer support: A theoretical model and how it translated into a national anti-bullying program. In S. Jimerson, S. Swearer, & D. Espelage (Eds.), *Handbook of bullying in schools: An international perspective* (pp. 441–454). New York: Routledge.

Salmivalli, C., Lagerspetz, K., Björkqvist, K., Österman, K., & Kaukiainen, A. (1996). Bullying as a group process: participant roles and their relations to social status within the group. *Aggressive Behavior, 22*, 1–15.

Salmivalli, C., Lappalainen, M., & Lagerspetz, K. M. J. (1998). Stability and change of behavior in connection with bullying in schools: a two-year follow-up. *Aggressive Behavior, 24*, 205–218.

Salmivalli, C., Ojanen, T., Haanpää, J., & Peets, K. (2005). 'I'm OK but You're Not' and other peer-relational schemas: explaining individual differences in children's social goals. *Developmental Psychology, 41*, 363–375.

Salmivalli, C., & Voeten, M. (2004). Connections between attitudes, group norms, and behaviour in bullying situations. *International Journal of Behavioral Development, 28*, 246–258.

Smith, P. K., & Brain, P. F. (2000). Bullying in the schools. *Aggressive Behavior, 26*, 1–9.

Smith, P. K., & Shu, S. (2000). What good schools can do about bullying. *Childhood, 7*, 193–212.

Smith, J., Schneider, B., Smith, P., & Ananiadou, K. (2004). The effectiveness of whole-school antibullying programs: a synthesis of evaluation research. *School Psychology Review, 33*, 547–561.

Steiger, J., & Lind, J. (1980). *Statistically based tests for the number of common factors*. Iowa City: Paper presented at the annual meeting of the Psychometric Society.

Ttofi, M. M., Farrington, D. P., & Baldry, C. A. (2008). *Effectiveness of programs to reduce school bullying: A systematic review*. Stockholm: Swedish National Council for Crime Prevention.

Tucker, L., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika, 38*(1), 1–10.

Vernberg, E. M., Ewell, K. K., Beery, S. H., Freeman, C. M., & Abwender, D. A. (1995). Aversive exchanges with peers and adjustment during early adolescence: is disclosure helpful? *Child Psychiatry and Human Development, 26*, 43–56.

Vuijk, P., van Lier, P. A. C., Crijnen, A. A. M., & Huizink, A. C. (2007). Testing sex-specific pathways from peer victimization to anxiety and depression in early adolescents through a randomized intervention trial. *Journal of Affective Disorders, 100*, 221–226.

Whitney, I., & Smith, P. K. (1993). A survey of the nature and extent of bullying in junior/middle and secondary schools. *Educational Research, 35*, 3–25.

Wilson, S. J., & Lipsey, M. W. (2007). School-based interventions for aggressive and disruptive behavior: update of a meta-analysis. *American Journal of Preventive Medicine, 33*, S130–S143.

Wilson, S. J., Lipsey, M. W., & Derzon, J. H. (2003). The effects of school-based intervention programs on aggressive behavior: a meta-analysis. *Journal of Consulting and Clinical Psychology, 71*, 136–149.