

## Peer Victimization, Poor Academic Achievement, and the Link Between Childhood Externalizing and Internalizing Problems

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This study explored whether early elementary school aged children's externalizing problems impede academic functioning and foster negative social experiences such as peer victimization, thereby making these children vulnerable for developing internalizing problems and possibly increasing their externalizing problems. It also explored whether early internalizing problems contributed to an increase in externalizing problems. The study examined 1,558 Canadian children from ages 6 to 8 years. Externalizing and internalizing problems, peer victimization, and school achievement were assessed annually. Externalizing problems lead to academic underachievement and experiences of peer victimization. Academic underachievement and peer victimization, in turn, predicted increases in internalizing problems and in externalizing problems. These pathways applied equally to boys and girls. No links from internalizing to externalizing problems were found.

Many children with externalizing problems (i.e., aggression, theft, vandalism, oppositional problems) also show internalizing problems (e.g., anxiety, depressive symptoms). For instance, correlations of .50 between childhood externalizing and internalizing problems have been reported in the general population (Achenbach & Rescorla, 2001). Similarly, clinical diagnoses of conduct disorder or oppositional defiant disorder often co-occur with diagnoses of anxiety and depression (Barker, Oliver, & Maughan, 2010; Wolff & Ollendick, 2006). More importantly, there is evidence that externalizing problems may precede and predict internalizing problems in child-

hood (Kiesner, 2002; Ladd & Troop-Gordon, 2003; Moilanen, Shaw, & Maxwell, 2010; van Lier & Koot, 2010), while a reverse path, from internalizing problems to externalizing problems has also been reported (Mesman, Bongers, & Koot, 2001). Consequently, it is possible that externalizing and internalizing problems "influence" each other over time according to a uni- or bi-directional cascade model that involves a series of mediators. In the present study, we examined such possible longitudinal pathways of influence between externalizing and internalizing problems over a 3-year period that encompasses a transition period (i.e., preschool to primary school). In studying these links, this study takes two possible emerging domains of risk in this period into account, namely, the emerging performance expectancies and the establishment of harmonious relationships with peers in a relatively structured social setting, the classroom.

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*Links Between Childhood Externalizing and Internalizing Problems: A Cascade Model*

The view that externalizing and internalizing problems may be interrelated over time because problems in one domain of functioning spread to another domain through various pathways corresponds to a cascade model (Masten, Burt, & Coatsworth, 2006; Masten & Cicchetti, 2010; Rutter & Sroufe, 2000; Sameroff, 2000; Sameroff & Mackenzie, 2003). A specific cascade model has been proposed by Patterson and his colleagues to account for the cross-over effect of childhood externalizing problems to internalizing problems (Patterson & Capaldi, 1990; Patterson, Reid, & Dishion, 1992). According to this model, also known as the dual failure model, externalizing problems hamper successful development of two key domains of competence, peer relations and academic performance. In turn, difficult peer relationships and poor academic development lead to an increase in internalizing problems.

The early elementary school period may be a particularly sensitive period in which the dual failure mechanism may begin to emerge. A major developmental task during this period is to become socially integrated into the increasingly complex peer-group context. Moreover, at the same time, children are expected to master new academic skills. Yet, externalizing problems may hamper success in both domains. Aggressive children at school entry may lack the competencies to interact positively with their peers (Barker et al., 2008; Snyder et al., 2008) and follow teachers' instructions carefully (Crosnoe et al., 2010; Sonnenschein, Stapleton, & Benson, 2010). Because of their externalizing behavior and lack of social skills, children often become actively disliked and victimized by their peers (Barker et al., 2008; Boivin & Hymel, 1997; Boivin, Hymel, & Bukowski, 1995; Brendgen et al., 2011; Buhs & Ladd, 2001; Buhs, Ladd, & Herald, 2006).

These early difficulties in peer relations and academic problems may lead to a poor self-appraisal, self-blame, low self-esteem, negative self-beliefs, feelings of loneliness, and fear of daily punishment in their new and nonfriendly school environment (Chapman, 1988; Cole, 1991; Cole, Jacquez, & Maschman, 2001; Cole, Martin, & Powers, 1997; Graham & Juvonen, 1998; Kochenderfer-Ladd & Ladd, 2001; Kochenderfer-Ladd & Wardrop, 2001; Ladd & Troop-Gordon, 2003). As such, the poor peer experiences and poor academic performance could foster growth in internalizing problems. Hence, part of

the observed increase in internalizing problems in elementary school (Bongers, Koot, van der Ende, & Verhulst, 2003; Côté et al., 2009) may be accounted for by the social and academic difficulties evoked by behavior problems.

It is important to note that the dual failure model is a unidirectional model. It predicts that externalizing problems fuel internalizing problems over time. However, in accordance with the "acting out" model (Carlson & Cantwell, 1980) a reverse link from internalizing to externalizing problems may also be possible. One study indeed found that—among boys only—social withdrawal and depression symptoms in early childhood contributed to externalizing problems at age 10 through social problems (Mesman et al., 2001). Boys who are victimized by their peers and experience school difficulties because they are shy and withdrawn might become resentful toward their peers and disengaged from school, thus becoming more disruptive and aggressive. Hence, the same mediating pathways could explain a possible bidirectional link between externalizing and internalizing problems. The link between internalizing to externalizing problems, however, remains speculative for two reasons. First, the finding reported by Mesman et al. (2001) that internalizing problems lead to an increase in externalizing problems in childhood was not replicated in other studies with primary school children (Ladd & Troop-Gordon, 2003; Moilanen et al., 2010; van Lier & Koot, 2010). Second, studies that did find an "acting out" link examined mainly adolescent samples, and did not test whether the paths from internalizing to externalizing problems included mediating pathways specific to academic performance and peer relations (Beyers & Loeber, 2003; Ritakallio et al., 2008; Vieno, Kiesner, Pastore, & Santinello, 2008).

In addition to explaining longitudinal links between externalizing and internalizing problems, the academic and social difficulties may also help explain why externalizing problems persist or even increase in some children. Once in place, early difficulties in peer relations and academic problems tend to follow an increasing spiral (Dodge et al., 2003; Ladd, 2006; Pedersen, Vitaro, Barker, & Borge, 2007; Vitaro, Pedersen, & Brendgen, 2007), possibly exacerbating the behavior problems that served to set them up in the first place. Such a process has been described as spiraling or transactional effects. Children who fail at school and are exposed to peer victimization because of their externalized problems may become resentful and oppositional over time. Thus, externalizing and internalizing problems

may not only become linked through the failing of social and academic development, but poor social and academic development could also predict a further increase in externalizing problems. The main objective of this study was therefore to test for the dual failure (or unidirectional cascade) model whereby externalizing problems predict an increase in internalizing problems because of a failure in both the social and academic domains. In addition, we tested two possible variants of the dual failure model: (a) an acting out (or reversed unidirectional cascade) model whereby internalizing problems lead to an increase in externalizing problems, also because a failure in both the social and academic domains, and (b) a spiraling model whereby externalizing problems and a failure in both the social and academic domains fuel each other mutually.

#### *The Role of Academic and Peer Problems in the Links Between Externalizing and Internalizing Problems*

Studies that focused on the possible mediating role of poor academic performance and peer victimization in the developmental links between externalizing and internalizing problems have focused on only one process, that is, academic or relational difficulty. For instance, a number of studies examined the role of academic problems in the link between externalizing and internalizing problems. Herman, Lambert, Ialongo, and Ostrander (2007) found that the link between attention problems in first grade and internalizing problems in third grade was explained by academic problems in first grade. Another study followed boys from low-socioeconomic-status (SES) families from age 6 to 12 years and found that academic difficulties linked externalizing to internalizing problems (Moilanen et al., 2010). Finally, in yet another study, age 10 externalizing, but not internalizing, problems were found to predict poor academic achievement at age 17. In turn, continuous poor academic achievement eventually predicted internalizing problems at age 30 years (Masten et al., 2005). Thus, studies examining academic failure as a potential mediating mechanism mainly found support that such difficulties linked externalizing to later internalizing problems.

Other studies focused on the role of social problems in the link between externalizing and internalizing problems (Kiesner, 2002; Ladd & Troop-Gordon, 2003; Leadbeater & Hoglund, 2009; Little & Garber, 2005; van Lier & Koot, 2010). Not all these studies focused specifically on victimization.

For instance, Little and Garber (2005) found that stressors such as peer relational difficulty (not necessarily victimization) mediated the path between externalizing problems in sixth grade and depressive symptoms in seventh grade. However, externalizing problems were not assessed in seventh grade, thereby precluding testing whether this mediation path remained significant when accounting for the possible co-occurrence of externalizing problems and depressive symptoms in seventh grade. However, Kiesner (2002), who studied peer preference, not victimization, reported that in late elementary school, peer preference did not link externalizing with internalizing problems.

Recent studies have focused on victimization, one of the most severe forms of peer relational difficulties because it involves manifest verbal insults, social harm, and sometimes physical pain. Ladd and Troop-Gordon (2003) found that kindergarten aggression predicted victimization across Grades 1 through 3, which in turn predicted Grade 4 internalizing problems. However, victimization experiences were not assessed in kindergarten, making it uncertain whether externalizing problems preceded victimization experiences. van Lier and Koot (2010) found that peer victimization and peer rejection were mutually linked over Grades 1–4. This joint effect of rejection and victimization mediated the longitudinal path from externalizing problems to internalizing problems. Another study showed that victimization in first grade contributed to an increase in aggression by second grade, which in turn predicted an increase in both victimization and internalizing problems by third grade (Leadbeater & Hoglund, 2009). This study also found that aggression and victimization were mutually linked, thereby showing not only a cross-over link from externalizing to internalizing, but also a spiraling effect between externalizing problems and victimization. Finally, in a study covering Grade 3 to Grade 6, evidence for spiraling effects was found for victimization and internalizing problems, but not between peer victimization and aggression (Boivin, Petittlerc, Feng, & Barker, 2010).

Of note, none of the above studies examined the potential additional role of academic problems. In fact, to our knowledge, only three studies focused on both academic *and* social problems with peers. Two of these studies used adolescent samples, whereas the third study did not use specific measures of peer difficulties. In the first study (Obradovic, Burt, & Masten, 2010), participants were followed from age 10 to age 30. Results showed that age 10 externalizing problems predicted future

academic problems, which in turn led to social problems (defined as low peer acceptance, low social skills, difficulties in friendship formation and maintenance), and—eventually—to internalizing problems. In the second study, Carter, Garber, Ciesla, and Cole (2006) studied the joint role of academic and peer victimization problems in adolescence and found that such problems predicted internalizing problems. In addition, the pooled academic and social problems were transactionally linked with externalizing problems. This supported a possible common mediating role of peer difficulties and academic performance on the longitudinal associations between externalizing and internalizing problems and on the development of externalizing problems. The last study (Burt & Roisman, 2010) found that preschool externalizing problems predicted both first grade academic difficulties and low social competence (i.e., a behavioral measure of cooperation, assertion, responsibility, and self-control). In turn, academic difficulties predicted third grade internalizing problems while low social competence predicted internalizing problems in fifth grade. Interestingly, academic difficulties and low social competence were also transactionally linked with externalizing problems, thereby also supporting a spiraling model. Thus, to our knowledge, only one study (i.e., Burt & Roisman, 2010) focused on the first years of elementary school. However, this study did not include a specific measure of peer difficulties but a measure of low social competence, that could lead to peer difficulties. Therefore, the central premises and possible extensions of the dual failure hypothesis still remain largely untested in the critical period in which children may first encounter the hypothesized connecting variables, namely, academic and peer-related difficulties.

*Hypotheses*

We aimed at clarifying the putative mediating role of peer victimization and academic difficulties in the development of externalizing and internalizing problems over a 3-year transitional period (kindergarten to first grades of elementary school) in a sample of 1,558 children from the general population of the Province of Quebec, Canada. To this end, three nested models were tested. The first model tested whether the cross-time links between externalizing and internalizing problems are best accounted for by direct links between externalizing and internalizing problems (Model 1, see Figure 1). This model was compared with the unidirectional

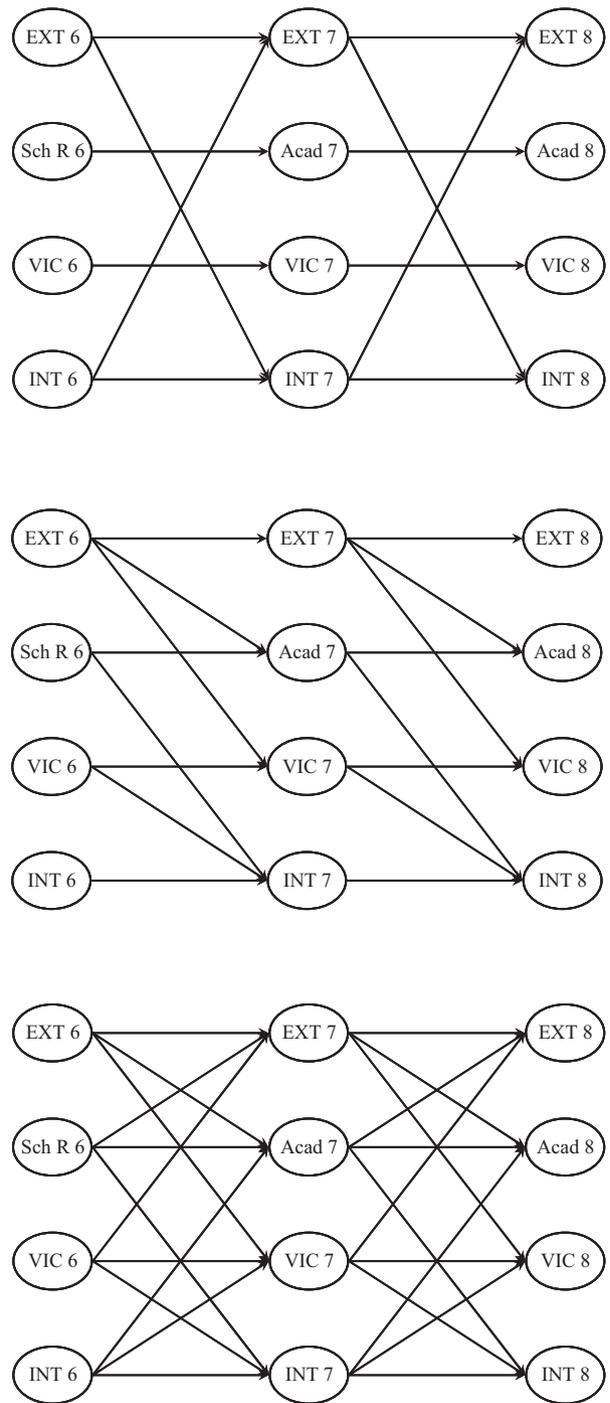


Figure 1. Conceptual presentation of hypothesized models. Note. The direct model (top) assumes no role of academic achievement or perceived victimization. The dual failure model (middle) assumes that academic achievement and perceived victimization connect externalizing with internalizing problems. Compared to the dual failure model, the transactional model (bottom) allows transactional paths between academic achievement and perceived victimization with both internalizing and externalizing problems. EXT = externalizing; INT = internalizing; Sch R = school readiness; Acad = academic achievement; VIC = perceived peer victimization.

dual failure model, a model in which externalizing problems indirectly contribute to internalizing problems through poor academic achievement and peer victimization (Model 2, see Figure 1). This second model was extended further into a transactional model. Here we tested whether the inclusion of a reversed pathway from internalizing to externalizing problems (possibly only for boys, as found by Mesman et al., 2001) or spiraling effects between externalizing problems and poor social and academic development are needed to account for the longitudinal associations (Model 3, see Figure 1). Given the age range of our sample, we think that a pathway from internalizing to externalizing problems is not to be expected. However, because of the evidence of spiraling effects between externalizing problems peer difficulties and poor school performance, we anticipated that this transactional model may have a better fit to the data than the unidirectional dual failure model. Despite these anticipated transactional links, we also hypothesized that the original dual failure paths would remain significant.

## Method

### Sample

Participants were part of the Québec Longitudinal Study of Child Development. The sample initially consisted of a representative sample of children born in the province of Québec, Montreal, Canada, between October 1997 and July 1998 (excluding children born in Cree or Inuit territories, Native Canadian reserves, or northern Québec). Participants were selected from the Québec Birth Registry through a stratified sampling procedure based on living area and birth rate. Families ( $N = 2,675$ ) were contacted by mail and telephone when children were approximately 4.5 months of age, and 83.1% participated in the first assessment, resulting in an initial sample of 2,120 children. Signed informed consent was obtained from mothers during the home visit. The ethics board of Santé Québec, the agency responsible for the data collection, approved the study. At Time 1, 51.2% of the children were boys and most (81%) were living in French-speaking families. On average, mothers and fathers were aged 28.8 and 31.8 years, respectively; 16.9% of mothers and 19.9% of fathers did not hold a high school degree; 27.7% reported an income lower than Can \$30,000 (US \$29,451), and 7.1% families were headed by a single parent. Before the first assessment used in this study, children were

assessed at four additional times: 17 months, 2.5 years, 3.5 years, and 4 years of age.

Data from Times 6 to 8 were used in this study. At Time 6, children were on average 6.1 years old (73.8 months,  $SD = 3.05$  months) and attended kindergarten. At Time 7 they were 7.1 years old (85.8 months,  $SD = 3.06$ ) and were in Grade 1 of elementary school. At Time 8, children were 8.1 years old (97.8 months,  $SD = 3.07$ ) and in Grade 2 elementary school. To maximize the use of available data, boys and girls with at least one data point on teacher-rated elementary school data when the children were 6, 7, or 8 years old were included in the analysis ( $n = 1,558$ ; 51% boys). Compared to the original sample at age 5 months (first assessment in this sample), mothers, but not fathers of excluded children had lower educational attainment, and excluded children came from families with a lower annual family income. However, excluded children were not rated as having a more difficult temperament by their mothers at age 5 months than children included in the study.

### Measures

Teacher reports of externalizing and internalizing problems were assessed via the Child Social Behavior Questionnaire (Tremblay et al., 1991). Externalizing problems were measured through 19 items assessing aggression (10 items), destructive behaviors (5 items), and oppositional defiant problems (4 items). Internalizing problems were measured through 10 items referring to depressive symptoms (6 items) and anxiety (4 items). All of the items were scored on a 3-point scale (0 = *never*, 1 = *sometimes*, 2 = *often*). Cronbach's alphas were .93, .93, and .93 for externalizing problems, and .84, .83, and .84 for internalizing problems at ages 6, 7, and 8 years, respectively.

Self-reported perceived victimization at ages 6, 7, and 8 years was assessed through structured interviews. The children were asked to rate the following five items (0 = *never*, 1 = *sometimes*, 2 = *often*): Does it ever happen that (a) some children at school call you names or say bad things to you? (b) some children at school say bad things behind your back to other children? (c) a child at school will not let you play with his/her group? (d) a child at school pushes, hits, or kicks you? (e) a child at school teases you in a mean way? Cronbach's alphas ranged from .67 to .84.

School readiness at age 6 years was assessed with the language and cognitive development scale of the Early Development Instrument (EDI; Janus &

Offord, 2007). The EDI taps several other aspects of child development (i.e., physical health, social competence, emotional maturity, communication skills, and general knowledge). We used the language and cognitive development scale because in a prior study this scale was found to best predict academic achievement in elementary school (Forget-Dubois et al., 2007). The language and cognitive development scale is composed of four sub-domains: Basic Numeracy Skills, Basic Literacy Skills, Advanced Literacy Skills, and Interest in Literacy/Numeracy and Memory. The items of the EDI are rated on different scales. Items are rated using 3-point or 5-point Likert scales. Following Janus and Offord's (2007) recommendations, we recoded all items on a scale of 0 to 10. Using this approach, the items of the four subscales were used as indicators for an overall language and cognitive development score ( $\alpha = .88$ ).

*Academic achievement* at ages 7 and 8 years was assessed using teacher ratings of children's school performance in four categories (reading, writing, mathematics, and overall achievement). For each of these categories, teachers had to compare the performance of each child with the average performance of his or her schoolmates on a 5-point Likert scale, (1 = *clearly under average*, 3 = *average*, 5 = *clearly above average*). The teachers were asked to rate the children by the end of the school year so they could base their ratings on numerous previous assessments of the children's achievement relative to that of their classmates. The four assessments were used as indicators for the total school achievement score. Alpha of this total score was .94 on both occasions.

### Statistical Analyses

Our hypotheses were tested using autoregressive cross-lagged—or transactional—models (Jöreskog, 1970). In such models, the autoregressive paths reflect the continuity within a specific variable. In addition, the cross-time, cross-lagged paths between different variables are estimated. Significant cross-lagged paths indicate directional effects between different variables above and beyond the autoregressive (stability) paths of these variables from one time to the next. Within-time correlations across domains were allowed for. To test for indirect, or cascade effects, the significance of the paths that comprise the indirect effect was estimated (MacKinnon, Lockwood, & Williams, 2004).

All models were fitted in Mplus version 5.1 (Muthén & Muthén, 1998-2010). An MLR estimator, which produces robust standard errors, was used

to account for possible non-normal distribution of the study variables. To determine model fit, we used the comparative fit index (CFI) and Tucker-Lewis index (TLI), with values  $> .90$  indicating acceptable fit and values  $> .95$  indicating close fit (Bentler & Bonett, 1980), and the root mean square error of approximation (RMSEA), with values between .08 and .06 indicating acceptable fit and values  $< .06$  indicating close fit (Browne & Cudeck, 1993). Missing data were handled using full information maximum likelihood estimation.

## Results

### Descriptive Data

The raw means of children's internalizing and externalizing problems are presented in Table 1. Compared to girls, boys had higher externalizing problem scores but similar scores on internalizing problems. The correlations among all study variables are presented in Table 2. Both cross-sectional and longitudinal positive correlations were found between externalizing and internalizing problems. In addition, both externalizing and internalizing problems were correlated with poor academic achievement and perceived peer victimization in expected ways.

Table 1  
Means and Standard Deviations of Externalizing and Internalizing Problems, Victimization, and Academic Achievement Scores From Ages 6 to 8 Years

	Boys		Girls		Test
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>
Externalizing					
6 years	5.89	7.40	2.83	4.80	58.08**
7 years	6.16	7.16	2.94	5.18	86.71**
8 years	5.53	6.79	2.81	5.10	64.74**
Internalizing					
6 years	3.74	3.41	3.48	3.19	1.49
7 years	4.49	3.49	4.05	3.56	4.98
8 years	4.37	3.59	3.88	3.33	6.36
Academic achievement					
6 years <sup>a</sup>	47.55	9.54	50.36	8.14	24.35**
7 years	13.65	4.70	14.64	4.54	14.72**
8 years	13.51	4.45	14.61	4.61	18.16**
Victimization					
6 years	4.31	2.98	3.90	2.80	6.02*
7 years	4.22	2.78	3.80	2.71	8.67**
8 years	4.36	2.87	3.87	2.70	11.08**

<sup>a</sup>Scores reflect school readiness score.

\* $p < .05$ . \*\* $p < .01$ .

Table 2  
Correlations Between Study Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Externalizing 6	—										
2. Externalizing 7	.65	—									
3. Externalizing 8	.51	.62	—								
4. Internalizing 6	<b>.32</b>	.16	.06 <sup>a</sup>	—							
5. Internalizing 7	.20	<b>.32</b>	.20	.38	—						
6. Internalizing 8	.18	.23	<b>.32</b>	.28	.38	—					
7. Victimization 6	<b>.51</b>	.32	.22	<b>.38</b>	.19	.10	—				
8. Victimization 7	.30	<b>.49</b>	.24	.18	<b>.40</b>	.24	.20	—			
9. Victimization 8	.16	.22	<b>.31</b>	.07	.10	<b>.26</b>	.15	.25	—		
10. School readiness 6	<b>-.25</b>	-.20	-.19	<b>-.42</b>	-.36	-.32	<b>-.12</b>	-.06 <sup>a</sup>	-.06 <sup>a</sup>	—	
11. Academic achievement 7	-.19	<b>-.28</b>	-.23	-.27	<b>-.38</b>	-.38	-.06 <sup>a</sup>	<b>-.12</b>	-.13	.52	—
12. Academic achievement 8	-.17	-.24	<b>-.27</b>	-.27	-.33	<b>-.43</b>	-.05 <sup>a</sup>	-.12	<b>-.11</b>	.50	.77

Note. Correlation coefficients are significant at  $p < .01$ . Bold entries reflect cross-sectional correlation coefficients.  
<sup>a</sup>Not significant.

Measurement Models

We examined the measurement models at each cross-section of time prior to fitting the structural models. Three measurement models were fitted, which consisted of four latent factors representing the four study constructs, and the manifest variables serving as the indicators of these latent factors (see Table 3). The latent factors were allowed to correlate. Model fit indices (see Table 3) showed that fit to the data was acceptable at the age 6 assessment and good at ages 7 and 8 years.

Academic Achievement, Perceived Victimization, and the Link Between Externalizing and Internalizing Problems

We fitted the models as depicted in Figure 1. The fit statistics of each model are presented in Table 4. Our first model, the direct effects model, assumes no role of academic achievement or perceived victimization in the link between externalizing and internalizing problems. It contained only autoregressive paths and longitudinal cross-lagged links between externalizing and internalizing problems, in addition to cross-sectional correlations between internalizing and externalizing problems, academic achievement and perceived victimization. The fit of this model was compared with the fit of the dual failure, or unidirectional cascade model (see Figure 1, middle). This second model assumed an indirect link from externalizing to internalizing problems through poor academic achievement and perceived victimization. This model had a significantly better fit to the data than the direct effects model,  $\Delta\chi^2(4) = 95.57, p < .01$ . However, the Lagrange multipliers indicated that the estimation of

Table 3  
Descriptors, Factor Loadings, and Variance Explained for Factors and Indicators Used in the Model

Factor and indicator	Age 6		Age 7		Age 8	
	$\lambda$	$R^2$	$\lambda$	$R^2$	$\lambda$	$R^2$
Externalizing						
Physical aggression	.88	.77	.89	.79	.89	.80
Disruptive problems	.77	.60	.75	.56	.70	.50
Oppositional problems	.90	.81	.86	.74	.90	.80
Internalizing						
Depressive symptoms	.97	.95	.93	.87	.90	.82
Anxiety	.65	.42	.62	.39	.70	.48
Victimization						
Call names	.65	.42	.66	.42	.67	.45
Behind back	.60	.35	.60	.36	.59	.35
Left out of play	.53	.28	.45	.20	.50	.25
Pushed, hit, kicked	.63	.40	.61	.37	.62	.38
Teased	.57	.33	.59	.35	.61	.37
Academic achievement						
Reading	—		.93	.87	.91	.83
Writing	—		.90	.82	.89	.78
Mathematics	—		.78	.61	.81	.65
Overall achievement	—		.95	.91	.97	.93
School readiness						
Basic numeracy	.98	.97	—		—	
Basic literacy	.69	.48	—		—	
Advanced literacy	.77	.60	—		—	
Interest in literacy	.76	.59	—		—	
Interest in numeracy	.74	.54	—		—	
Memory	.67	.45	—		—	
Model fit						
CFI	.94		.98		.96	
TLI	.92		.97		.95	
RMSEA	.06		.04		.05	

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation.

Table 4  
Fit Statistics and Nested Model Comparisons

Model	SEM							Difference test of relative fit				
	No. cross-domain paths	df	c	$\chi^2$	CFI	TLI	RMSEA	Model comparison	cd	$\Delta\chi^2$	$\Delta df$	p
1 Direct	4	872	1.12	2171.01	.95	.94	.03					
2 Dual failure	8	868	1.12	2073.65	.95	.95	.03	2 vs. 1	0.90	107.93	4	.00
<b>3 Transactional</b>	<b>16</b>	<b>860</b>	<b>1.12</b>	<b>2039.09</b>	<b>.95</b>	<b>.95</b>	<b>.03</b>	<b>3 vs. 2</b>	<b>1.01</b>	<b>34.14</b>	<b>8</b>	<b>.00</b>
Sex differences in transactional model												
4 Sex specific	16	1784	1.09	3369.85	.94	.93	.04					
5 Sex invariant	16	1800	1.09	3381.37	.94	.94	.03	5 vs. 4	1.09	10.53	16	.84

Note. The final selected model is in bold. c = weighting constant for computing the chi-square statistic using robust estimation method; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; cd = weighting constant for difference between two chi-square values using robust estimation.

additional cross-lagged links would further improve model fit. We therefore estimated a transactional model with cross-lagged links between all study variables across time (see Figure 2, transactional model). The results showed that this transactional model fit the data better than the direct effects model,  $\Delta\chi^2(16) = 130.80, p < .01$ , and the dual failure model  $\Delta\chi^2(12) = 30.84, p < .01$ .

We then tested whether the cross-lagged links in the transactional model were sex invariant. To this end, the magnitude of the path estimates of the transactional model was compared between boys and girls. A multiple group model was fitted in which all paths were estimated freely across sex groups (Model 4, Table 4). This model was compared to a model in which all cross-lagged paths were held equal across sex groups (Model 5).

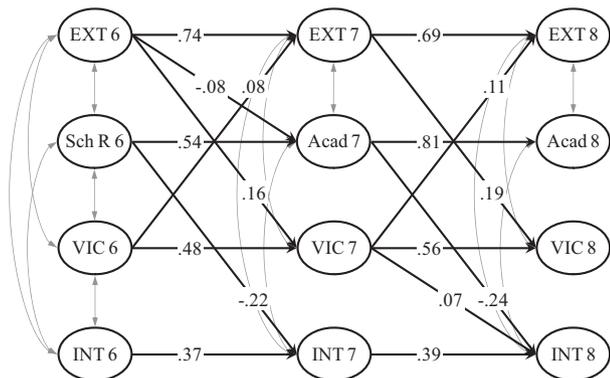


Figure 2. Results from the transactional model.  
Note. Developmental links between externalizing problems, academic achievement, perceived peer victimization, and internalizing problems. Entries reflect standardized path coefficients, significant at  $p < .05$ . EXT = externalizing; INT = internalizing; Sch R = school readiness; Acad = academic achievement; VIC = perceived peer victimization.

Results in Table 4 showed that allowing for sex differences did not improve model fit,  $\Delta\chi^2(16) = 12.00, p = .84$ . Thus the sex-invariant transactional model showed the best fit to the data. The significant parameters are presented in Figure 2.

Results from the transactional model showed significant stability paths of both externalizing and internalizing problems, as well as of academic achievement and perceived victimization. In addition to these stability paths, a number of significant cross-time links were found that were in line with our study hypotheses. First, in accordance with our dual failure hypothesis, significant cross-time links were found from externalizing problems to perceived victimization. In addition, a link from age 6 externalizing problems to academic achievement at age 7 was found. Age 7 academic achievement and perceived victimization predicted internalizing problems at age 8. We therefore tested whether the cross-over paths (or dual failure path) from age 6 externalizing to age 8 internalizing through, respectively, age 7 academic achievement and perceived victimization were significant. Results showed that the path through academic achievement was significant,  $B = 0.01, SE = 0.01, \beta = .02, p < .05$ . The pathway through perceived victimization just failed conventional levels of significance,  $B = 0.01, SE = 0.004, \beta = .01, p = .06$ .

Second, in addition to this link from externalizing to internalizing problems, results showed significant transactional links between externalizing problems and perceived victimization, thereby suggesting spiraling effects. A test of this indirect path showed that the development of externalizing problems from ages 6 to 8 years was in part accounted for by age 7 perceived victimization,  $B = 0.02, SE = 0.01, \beta = .02, p < .05$ . However, it is important

to note that such transactional links were limited to externalizing problems and victimization. Neither transactional links between externalizing problems and academic achievement nor links from internalizing problems to academic achievement or perceived victimization were found.

### Discussion

The goal of this study was to test the longitudinal pathways that may explain, at least partially, the co-occurrence between externalizing and internalizing problems in young children (Caron & Rutter, 1991). Specifically, in accordance to the dual failure model (Patterson & Capaldi, 1990), we tested whether early childhood externalizing behavior problems impede children's academic and peer relational development, which in turn make the children vulnerable for developing internalizing problems. The mediation path linking externalizing problems to internalizing problems through perceived victimization by peers just failed to reach conventional levels of significance ( $p$  value = .06). We nonetheless interpreted this indirect path as mostly supporting the dual failure model while acknowledging that the effect sizes of the indirect links are generally low in magnitude, which concurs with the effect sizes reported in previous studies (Ladd & Troop-Gordon, 2003; van Lier & Koot, 2010). Taking this into account, our results showed that in young elementary schoolchildren, externalizing problems add—through a cascade in which academic problems and peer victimization play an intermediate role—to the development of internalizing problems. This pattern of results applied to both boys and girls despite mean-level differences in externalizing problems, perceived peer victimization and academic achievement. More importantly, besides being evoked by externalizing problems, peer victimization also explained in part the development of externalizing problems. No evidence for a pathway from internalizing to externalizing problems through social and academic failure was found, however. Overall, our results signals a moderate role of social and academic failure in the joint development of externalizing and internalizing problems among young elementary schoolchildren.

#### *The Dual Failure Pathway*

With the exception of the recent study by Burt and Roisman (2010), to our knowledge, no prior study included parallel assessments of both aca-

demically and social difficulties in trying to understand the developmental relation between behavioral and emotional problems in the first years of elementary school. Our results mostly, but not entirely, concur with those from the Burt and Roisman study. Specifically, our study showed that both academic and peer difficulties linked externalizing problems with internalizing problems within the first 3 years of elementary school. In contrast, the study by Burt and Roisman found that only academic difficulties linked these problems in the early grades, whereas low social competence only linked externalizing to internalizing problems in grade 5. However, the Burt and Roisman study included a behavioral measure of social competence instead of a direct measure of social experiences with peers like in our study. Poor peer experiences may precede the development of poor social skills, as children who are victimized are likely denied the opportunities to interact with more accepted peers and to learn social norms and social skills through interactions with accepted peers (Rubin, Bukowski, & Parker, 2006). A study by Haselager et al. (2002) supports this directional hypothesis by showing that changes in peer acceptance predict changes in social skills.

The predictive association from externalizing to internalizing problems through peer victimization was not found by Leadbeater and Hogg (2009). Nevertheless, the study by Leadbeater and Hogg did suggest that the cycling of physical aggression and victimization contributes to increases in aggression and, in turn, to increases in both victimization and internalizing problems. The fact that in the Leadbeater and Hogg (2009) study approximately two thirds of the children received a program aimed at preventing victimization, thereby possibly reducing variance in peer victimization, could explain the differences with the present study.

#### *Extensions of the Dual Failure Model*

Only one of the anticipated extensions (or variants) of the dual failure model was supported by our data, albeit partially. Specifically, we found support for the hypothesized spiraling effect of externalizing problems through perceived peer victimization. This finding is important in two ways. First, it confirms the importance of early peer relationships with respect to externalizing problems (Snyder, West, Stockemer, Gibbons, & Alquist-Parks, 1996) and earlier reports of spiraling of externalizing problems through peer victimization (Ladd & Troop-Gordon, 2003; Leadbeater & Hogg, 2009).

It is possible that victimized children learn to become more aggressive by being occasionally reinforced for successfully hitting or calling back onto their aggressors (Renouf et al., 2010). It is also possible that children who are victimized by their peers as a consequence of their behavioral problems become even more oppositional and disruptive because they also tend to be disliked by their teacher (Brendgen et al., 2011; Leflot, van Lier, Verschueren, Onghena, & Colpin, 2011). Second, it confirms earlier findings that academic difficulties do not predict an increase in externalizing problems, although they are related to an increase in internalizing problems (Tremblay et al., 1992).

We found no support for an acting out pathway as internalizing problems did not predict an increase in externalizing problems. This result is in line with most studies that examined a possible predictive link from internalizing to externalizing problems in young children (Ladd & Troop-Gordon, 2003; Moilanen et al., 2010; van Lier & Koot, 2010). This result is not in line, however, with studies that examined the directional link between internalizing and externalizing problems in adolescents (Beyers & Loeber, 2003; Ritakallio et al., 2008; Vieno et al., 2008). Contrary to adolescents, young children with internalizing problems may not be at risk of victimization by their peers because such behavior is not (yet) perceived as deviating from the norm (Boivin et al., 2010; Younger, Gentile, & Burgess, 1993). This may also explain why young children with internalizing problems may not (yet) lag behind in school. The only study that reported a directional link between internalizing and externalizing problems in young children found support for such a link only in boys (Mesman et al., 2001). In that study, however, not all constructs were measured at each assessment point, making it impossible to adjust the longitudinal association for possible concurrent links.

In sum, our study extends previous research by showing that poor peer experiences such as peer victimization connect externalizing with internalizing problems independently of academic difficulties, although peer difficulties and academic problems are concurrently linked. The significance of this finding lies in the age period studied. This study is the first to show a role of peer victimization during the first years of schooling with respect to the cascade pathway from externalizing to internalizing problems, and with respect to the spiraling effects of externalizing problems. With the transition to elementary school, some children's social difficulties expand drastically as peer relations

develop, in addition to showing the first signs of academic failure. These negative early experiences will likely become chronic and seriously hamper children's future development (Masten, Desjardins, McCormick, Kuo, & Long, 2010; Moilanen et al., 2010; Pedersen et al., 2007; van Lier & Koot, 2010; Vitaro et al., 2007).

The present study demonstrated the importance of early externalizing problems as the key step in the cascade into poor social and academic development and internalizing problems. It is also important to note that this cascade is likely to become more complex. The resulting interpersonal and intrapersonal processes accounting for the links between peer victimization and academic difficulties, on the one hand, and increasing internalizing problems on the other hand likely include both psychological and social factors. Psychological mediating factors may include low self-esteem, increased sensitivity to failure and punishment, school dissatisfaction, feelings of loneliness, and negative social comparison (Chapman, 1988; Cole, 1991; Cole et al., 1997; Cole et al. 2001; Graham & Juvonen, 1998; Kochenderfer-Ladd & Ladd, 2001; Kochenderfer-Ladd & Wardrop, 2001; Ladd & Troop-Gordon, 2003). Social mediating factors may include a lack of peer and teacher support (Leflot, van Lier, Onghena, & Colpin, 2010; Leflot et al., 2011), affiliation with deviant friends who might victimize and dominate children further (Crick & Nelson, 2002), and parent, teacher, and peer disapproval of low achievement (Leung, Yeung, & Wong, 2010; Liew, Chen, & Hughes, 2010; Sage & Kindermann, 1999; Tan & Goldberg, 2009). Additional studies are needed to document those intra- and interpersonal micro-processes that might explain how peer victimization and school difficulties are related to an increase in internalizing problems. The links are likely not direct.

#### *Limitations and Conclusions*

There are limitations to this study that need to be taken into account while appreciating the theoretical and practical implications of the findings. First, although experiences of victimization may be a clear indication of poor social relations with peers, these children are possibly not just victims of aggressive acts by others, but likely also perpetrators of victimization acts towards others. In this regard, the power imbalance, which is implicated by pure victimization, was not assessed, although co-occurring externalizing problems were controlled in the models. Second, the analyses were

conducted on a selected subset of the initial sample, for which elementary school data were available. We did find differences between participants included in our study sample and those who were excluded with respect to family income and educational attainment of the mother, but not with respect to child temperament. The two groups of children may nonetheless be different on other variables. Third, children's self-reports of perceived peer victimization were used. Although a different informant was used than for the assessment of behavioral and emotional problems (i.e., teachers), self-reports of victimization may not totally reflect actual victimization experiences.

Because self-reports represent the child's view of his or her relationship with peers, they may also reflect low self-esteem or even depressive symptoms, in addition to actual victimization experiences. However, the low magnitude of the developmental link between victimization and internalizing problems in our study suggests that the self-reported victimization score was not overly confounded with depressive symptoms. Related to this, we examined peer victimization whereas other studies on difficulties in social relations often used peer rejection or friendlessness. However, peer rejection and peer victimization have been found to mutually influence each other over time during the early elementary school period (van Lier & Koot, 2010), which suggests that both are clear and genuine indicators of social relational difficulties during this period. Moreover, friendlessness was found to be unrelated to the development of internalizing problems when rejection or victimization experiences were accounted for (van Lier & Koot, 2010). Fourth, we used a teacher rating of internalizing problems. Because teachers may not be entirely aware of the full extent of internalizing problems in the children in their classroom, the use of parent ratings may provide additional information. Fifth, actual academic achievement was assessed at ages 7 and 8, but such a score was not available at age 6 because the children were still in kindergarten. Instead, a school readiness measure was used at age 6. Although the stability path from age 6 school readiness to age 7 academic achievement was significant, its magnitude was lower than the path from ages 7 to 8, when the same measure of academic achievement was used. However, investigating stability of academic achievement was not an objective of this study. We wanted to examine whether academic achievement acted as a connector between prior levels of externalizing problems and the development of future internalizing

problems, while controlling for concurrent links and prior problems within the same or a closely related domain. Finally, it is important to note that our study used a correlational, albeit longitudinal, design. Nonmeasured variables could influence or even account for the indirect relations between externalizing problems, perceived peer victimization, and internalizing problems or the direct relations between externalizing and internalizing problems. Therefore, no causal conclusions can be drawn from this study.

Notwithstanding these limitations, the present study showed that over the first years of elementary school, externalizing problems impede children's academic functioning and social relations with peers. This, in turn, makes some children vulnerable for developing internalizing problems and a spiraling of externalizing problems, as well. Although the effects were limited in magnitude, these findings have implications for research and clinical work. Specifically, researchers studying the causes and development of internalizing problems, as well as clinicians working with children who develop such problems, should consider previously existing externalizing problems, as well as experiences of victimization and previous academic performance. Moreover, experiences of peer victimization may play a role in broader psychopathology, because victimization also contributed to the development of externalizing problems. Thus, while both internalizing and externalizing problems may share a common risk factor, it appears that externalizing problems could contribute to the development of internalizing problems in middle childhood, but not the other way around. Finally, given the pivotal role of early externalizing problems in setting off the cascade of negative consequences, our results point to the importance of early detection and intervention of externalizing problems in elementary school.

## References

- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA School-Age Forms & Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families.
- Barker, E. D., Boivin, M., Brendgen, M., Fontaine, N., Arseneault, L., Vitaro, F., et al. (2008). Predictive validity and early predictors of peer-victimization trajectories in preschool. *Archives of General Psychiatry*, *65*, 1185–1192.
- Barker, E. D., Oliver, B. R., & Maughan, B. (2010). Co-developing problems of early onset persistent, childhood limited and adolescent onset conduct problem

- youth. *Journal of Child Psychology and Psychiatry*, 51, 1217–1226.
- Bentler, P. B., & Bonett, D. G. (1980). Significance tests and goodness-of-fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588–606.
- Beyers, J. M., & Loeber, R. (2003). Untangling developmental relations between depressed mood and delinquency in male adolescents. *Journal of Abnormal Child Psychology*, 31, 247–266.
- Boivin, M., & Hymel, S. (1997). Peer experiences and social self-perceptions: A sequential model. *Developmental Psychology*, 33, 135–145.
- Boivin, M., Hymel, S., & Bukowski, W. M. (1995). The roles of social withdrawal, peer rejection, and victimization by peers in predicting loneliness and depressed mood in childhood. *Development and Psychopathology*, 7, 765–785.
- Boivin, M., Petitclerc, A., Feng, B., & Barker, E. D. (2010). The developmental trajectories of peer victimization in middle to late childhood and the changing nature of their behavioral correlates. *Merrill-Palmer Quarterly-Journal of Developmental Psychology*, 56, 231–260.
- Bongers, I. L., Koot, H. M., van der Ende, J., & Verhulst, F. C. (2003). The normative development of child and adolescent problem behavior. *Journal of Abnormal Psychology*, 112, 179–192.
- Brendgen, M., Boivin, M., Barker, E. D., Girard, A., Vitaro, F., Dionne, G., et al. (2011). Gene-environment processes linking aggression, peer victimization, and the teacher-child relationship. *Child Development*, 82, 2021–2036.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.
- Buhs, E. S., & Ladd, G. W. (2001). Peer rejection as an antecedent of young children's school adjustment: An examination of mediating processes. *Developmental Psychology*, 37, 550–560.
- Buhs, E. S., Ladd, G. W., & Herald, S. L. (2006). Peer exclusion and victimization: Processes that mediate the relation between peer group rejection and children's classroom engagement and achievement. *Journal of Educational Psychology*, 98, 1–13.
- Burt, K. B., & Roisman, G. I. (2010). Competence and psychopathology: Cascade effects in the NICHD Study of Early Child Care and Youth Development. *Development and Psychopathology*, 22, 557–567.
- Carlson, G. A., & Cantwell, D. P. (1980). Unmasking masked depression in children and adolescents. *American Journal of Psychiatry*, 137, 445–449.
- Caron, C., & Rutter, M. (1991). Comorbidity in child psychopathology: Concepts, issues and research strategies. *Journal of Child Psychology and Psychiatry & Allied Disciplines*, 32, 1063–1080.
- Carter, J. S., Garber, J., Ciesla, J. A., & Cole, D. A. (2006). Modeling relations between hassles and internalizing and externalizing symptoms in adolescents: A four-year prospective study. *Journal of Abnormal Psychology*, 115, 428–442.
- Chapman, J. W. (1988). Cognitive-motivational characteristics and academic-achievement of learning-disabled children: A longitudinal study. *Journal of Educational Psychology*, 80, 357–365.
- Cole, D. A. (1991). Preliminary support for a competency-based model of depression in children. *Journal of Abnormal Psychology*, 100, 181–190.
- Cole, D. A., Jacquez, F. M., & Maschman, T. L. (2001). Social origins of depressive cognitions: A longitudinal study of self-perceived competence in children. *Cognitive Therapy & Research*, 25, 377–395.
- Cole, D. A., Martin, J. M., & Powers, B. (1997). A competency-based model of child depression: A longitudinal study of peer, parent, teacher, and self-evaluations. *Journal of Child Psychology and Psychiatry*, 38, 505–514.
- Côté, S. M., Boivin, M., Liu, X., Nagin, D. S., Zoccolillo, M., & Tremblay, R. E. (2009). Depression and anxiety symptoms: Onset, developmental course and risk factors during early childhood. *Journal of Child Psychology and Psychiatry*, 50, 1201–1208.
- Crick, N. R., & Nelson, D. A. (2002). Relational and physical victimization within friendships: Nobody told me there'd be friends like these. *Journal of Abnormal Child Psychology*, 30, 599–607.
- Crosnoe, R., Burchinal, M., Keating, D., Clarke-Stewart, K. A., Morrison, F., Pianta, R., et al. (2010). Instruction, teacher-student relations, and math achievement trajectories in elementary school. *Journal of Educational Psychology*, 102, 407–417.
- Dodge, K. A., Lansford, J. E., Burks, V. S., Bates, J. E., Pettit, G. S., Fontaine, R., et al. (2003). Peer rejection and social information-processing factors in the development of aggressive behavior problems in children. *Child Development*, 74, 374–393.
- Forget-Dubois, N., Lemelin, J. P., Boivin, M., Dionne, G., Séguin, J. R., Vitaro, F., et al. (2007). Predicting early school achievement with the EDI: A longitudinal population-based study. *Early Education and Development*, 18, 405–426.
- Graham, S., & Juvonen, J. (1998). Self-blame and peer victimization in middle school: An attributional analysis. *Developmental Psychology*, 34, 587–599.
- Haselager, G. J., Cillessen, A. H., Van Lieshout, C. F., Riksen-Walraven, J. M., Hartup, W. W., & Bukowski, W. M. (2002). Heterogeneity among peer-rejected boys across middle childhood: Developmental pathways of social behavior. *Developmental Psychology*, 38, 446–456.
- Herman, K. C., Lambert, S. F., Ialongo, N. S., & Ostrander, R. (2007). Academic pathways between attention problems and depressive symptoms among urban African American children. *Journal of Abnormal Child Psychology*, 35, 265–274.
- Janus, M., & Offord, D. R. (2007). Development and psychometric properties of the Early Development Instrument (EDI): A measure of children's school readiness. *Canadian Journal of Behavioral Science*, 39, 1–22.

- Jöreskog, K. G. (1970). A general method for analysis of covariance structures. *Biometrika*, *57*, 239–251.
- Kiesner, J. (2002). Depressive symptoms in early adolescence: Their relations with classroom problem behavior and peer status. *Journal of Research on Adolescence*, *12*, 463–478.
- 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.
- 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.
- Ladd, G. W. (2006). Peer rejection, aggressive or withdrawn behavior, and psychological maladjustment from ages 5 to 12: An examination of four predictive models. *Child Development*, *77*, 822–846.
- 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.
- Leadbeater, B. J., & Hoglund, W. L. (2009). The effects of peer victimization and physical aggression on changes in internalizing from first to third grade. *Child Development*, *80*, 843–859.
- Leflot, G., van Lier, P. A., Onghena, P., & Colpin, H. (2010). The role of teacher behavior management in the development of disruptive behaviors: An intervention study with the Good Behavior Game. *Journal of Abnormal Child Psychology*, *38*, 869–882.
- Leflot, G., van Lier, P. A., Verschueren, K., Onghena, P., & Colpin, H. (2011). Transactional associations among teacher support, peer social preference, and child externalizing behavior: A four-wave longitudinal study. *Journal of Clinical Child and Adolescent Psychology*, *40*, 87–99.
- Leung, G. S. M., Yeung, K. C., & Wong, D. F. K. (2010). Academic stressors and anxiety in children: The role of paternal support. *Journal of Child and Family Studies*, *19*, 90–100.
- Liew, J., Chen, Q., & Hughes, J. N. (2010). Child effortful control, teacher-student relationships, and achievement in academically at-risk children: Additive and interactive effects. *Early Childhood Research Quarterly*, *25*, 51–64.
- Little, S. A., & Garber, J. (2005). The role of social stressors and interpersonal orientation in explaining the longitudinal relation between externalizing and depressive symptoms. *Journal of Abnormal Psychology*, *114*, 432–443.
- MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research*, *39*, 99–128.
- Masten, A. S., Burt, K. B., & Coatsworth, J. D. (2006). Competence and psychopathology in development. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology* (Vol. 3, 2nd ed., pp. 696–738). New York: Wiley.
- Masten, A. S., & Cicchetti, D. (2010). Developmental cascades. *Development and Psychopathology*, *22*, 491–495.
- Masten, A. S., Desjardins, C. D., McCormick, C. M., Kuo, S. I., & Long, J. D. (2010). The significance of childhood competence and problems for adult success in work: A developmental cascade analysis. *Development and Psychopathology*, *22*, 679–694.
- Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradovic, J., Riley, J. R., et al. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, *41*, 733–746.
- Mesman, J., Bongers, I. L., & Koot, H. M. (2001). Pre-school developmental pathways to preadolescent internalizing and externalizing problems. *Journal of Child Psychology and Psychiatry*, *42*, 679–689.
- Moilanen, K. L., Shaw, D. S., & Maxwell, K. L. (2010). Developmental cascades: Externalizing, internalizing, and academic competence from middle childhood to early adolescence. *Development and Psychopathology*, *22*, 635–653.
- Muthén, L. K., & Muthén, B. O. (1998–2010). *Mplus user's guide* (5th ed.). Los Angeles, CA: Muthén & Muthén.
- Obradovic, J., Burt, K. B., & Masten, A. S. (2010). Testing a dual cascade model linking competence and symptoms over 20 years from childhood to adulthood. *Journal of Clinical Child and Adolescent Psychology*, *39*, 90–102.
- Patterson, G. R., & Capaldi, D. M. (1990). A mediational model for boys' depressed mood. In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 141–163). New York: Cambridge University Press.
- Patterson, G. R., Reid, J. B., & Dishion, T. J. (1992). *Antisocial boys* (Vol. 4). Eugene, OR: Castina.
- Pedersen, S., Vitaro, F., Barker, E. D., & Borge, A. I. (2007). The timing of middle-childhood peer rejection and friendship: Linking early behavior to early-adolescent adjustment. *Child Development*, *78*, 1037–1051.
- Renouf, A., Brendgen, M., Seguin, J. R., Vitaro, F., Boivin, M., Dionne, G., et al. (2010). Interactive links between theory of mind, peer victimization, and reactive and proactive aggression. *Journal of Abnormal Child Psychology*, *38*, 1109–1123.
- Ritakallio, M., Koivisto, A. M., von der Pahlen, B., Pelkonen, M., Marttunen, M., & Kaltiala-Heino, R. (2008). Continuity, comorbidity and longitudinal associations between depression and antisocial behaviour in middle adolescence: A 2-year prospective followup study. *Journal of Adolescence*, *31*, 355–370.
- Rubin, K. H., Bukowski, W. M., & Parker, J. G. (2006). Peer interactions, relationships, and groups. In N. Eisenberg (Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (pp. 571–645). Hoboken, NJ: Wiley.

- Rutter, M., & Sroufe, L. A. (2000). Developmental psychopathology: Concepts and challenges. *Development and Psychopathology, 12*, 265–296.
- Sage, N. A., & Kindermann, T. A. (1999). Peer networks, behavior contingencies, and children's engagement in the classroom. *Merrill-Palmer Quarterly, 45*, 143–171.
- Sameroff, A. J. (2000). Developmental systems and psychopathology. *Development and Psychopathology, 12*, 297–312.
- Sameroff, A. J., & Mackenzie, M. J. (2003). Research strategies for capturing transactional models of development: The limits of the possible. *Development and Psychopathology, 15*, 613–640.
- Snyder, J., Schrepferman, L., McEachern, A., Barner, S., Johnson, K., & Provines, J. (2008). Peer deviancy training and peer coercion: Dual processes associated with early-onset conduct problems. *Child Development, 79*, 252–268.
- Snyder, J., West, L., Stockemer, V., Gibbons, S., & Alquist-Parks, L. (1996). A social learning model of peer choice in the natural environment. *Journal of Applied Developmental Psychology, 17*, 215–237.
- Sonnenschein, S., Stapleton, L. M., & Benson, A. (2010). The relation between the type and amount of instruction and growth in children's reading competencies. *American Educational Research Journal, 47*, 358–389.
- Tan, E. T., & Goldberg, W. A. (2009). Parental school involvement in relation to children's grades and adaptation to school. *Journal of Applied Developmental Psychology, 30*, 442–453.
- Tremblay, R. E., Loeber, R., Gagnon, C., Charlebois, P., Larivée, 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.
- Tremblay, R. E., Masse, B., Perron, D., Leblanc, M., Schwartzman, A. E., & Ledingham, J. E. (1992). Early disruptive behavior, poor school achievement, delinquent behavior, and delinquent personality: Longitudinal analyses. *Journal of Consulting and Clinical Psychology, 60*, 64–72.
- 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.
- Vieno, A., Kiesner, J., Pastore, M., & Santinello, M. (2008). Antisocial behavior and depressive symptoms: Longitudinal and concurrent relations. *Adolescence, 43*, 649–660.
- Vitaro, F., Pedersen, S., & Brendgen, M. (2007). Children's disruptiveness, peer rejection, friends' deviancy, and delinquent behaviors: A process-oriented approach. *Development and Psychopathology, 19*, 433–453.
- Wolff, J. C., & Ollendick, T. H. (2006). The comorbidity of conduct problems and depression in childhood and adolescence. *Clinical Child and Family Psychology Review, 9*, 201–220.
- Younger, A. J., Gentile, C., & Burgess, K. (1993). Children's perceptions of social withdrawal: Changes across age. In K. H. Rubin & J. B. Asendorph (Eds.), *Social withdrawal, inhibition, and shyness in childhood* (pp. 215–235). Hillsdale, NJ: Erlbaum.