Supplementary Material: Early Co-Occurrence of Peer Victimization and Aggression

Preliminary Data Analysis

Psychometric analysis. Measurement models testing the invariance of the peer relational and overt victimization and aggression constructs across grade at wave 1 were established first. Models with the factor loadings of the indicators (item scores) constrained to be equal across grades were compared to models with these equalities relaxed. These analyses indicated an invariant factor structure across grades for each construct: relational victimization, $\Delta\chi^2(15) = 15.37$, *ns, CFI* = 0.98, *RMSEA* = .04; overt victimization, $\Delta\chi^2(15) = 12.95$, *ns, CFI* = 0.94, *RMSEA* = .08; relational aggression, $\Delta\chi^2(2) = 5.92$, *ns, CFI* = 0.94, *RMSEA* = .10; and overt aggression, $\Delta\chi^2(2) = 3.73$, *ns, CFI* = 0.99, *RMSEA* = .10.

Measurement invariance of the relational and overt victimization and aggression constructs across the six waves of data was assessed next in three consecutive steps (Widaman, Ferrer, & Conger, 2010). First, a configural model where the factor loadings and intercepts of the indicators were free to vary across waves was tested. Second, a metric invariance model where the factor loadings were constrained to be equal across waves was assessed. Third, a scalar invariance model where the factor loadings and intercepts were constrained to be equal across waves was tested. Across the 6 waves, partial scalar invariance, where the equality constraint on the intercept for 1 item was relaxed, was achieved for: relational victimization, $\Delta\chi^2(15) = 27.64$, *ns, CFI* = 0.92, *RMSEA* = .04; overt victimization, $\Delta\chi^2(18) = 24.37$, *ns, CFI* = 0.91, *RMSEA* = .04; relational aggression, $\Delta\chi^2(6) = 5.97$, *ns, CFI* = 0.91, *RMSEA* = .06; and overt aggression $\Delta\chi^2(8) = 9.27$, *ns, CFI* = 0.89, *RMSEA* = .09.

Descriptive statistics. Using wave as the time metric, average levels of peer relational and overt victimization and aggression were low at each wave (see Table S1). At wave 1, average levels of peer likeability were moderate and internalizing problems, hyperactive behaviors, and hostile attributions were low. Peer relational and overt victimization and aggression were moderately stable across waves (see Table S2). Relational and overt victimization were positively and moderately correlated across waves, as were relational and overt aggression. Relational and overt victimization were also weakly to moderately correlated with relational and overt aggression within and across waves.

Accelerated Latent Growth Mixture Modeling

Peer victimization. For relational victimization, one latent class trajectory represented about one fifth of the children ($n = 98$; 19.5%), and showed a high frequency of relational victimization at age 4.5 years that increased linearly but slowed in that rate of increase by age 10.5 years (see Table S4). The second latent class trajectory represented the majority of children ($n = 404$; 80.5%), and showed a low frequency of relational victimization that decreased linearly and then slowed in that rate of decrease by age 10.5 years. The posterior probabilities indicated that children were well matched to their latent class (.86 and .94, respectively). For overt victimization, one latent class trajectory represented about one quarter of children ($n = 121$; 24.1%), and showed a high chronic frequency of overt victimization from age 4.5 to 10.5 years (see Table S4). The second latent class trajectory represented about three quarters of children ($n = 382$; 75.9%), and showed a low frequency of overt victimization from age 4.5 to 10.5 years. The posterior probabilities indicated that children were well matched to their latent class (.81 and .92, respectively).

Peer aggression. Similar to the findings for peer victimization, a two class solution was identified as the best fitting model for both relational aggression and overt aggression, with similar results for girls and boys (see Table S3). For relational aggression, one latent class trajectory represented a small proportion of children ($n = 37$; 7.4%), with a high degree of relational aggression at age 4.5 years that increased linearly and then slowed in that increase by age 10.5 years (see Table S4). The second latent class trajectory represented the majority of children ($n = 466$; 92.6%), and showed a low decreasing trajectory of relational aggression from 4.5 to 10.5 years. The posterior probabilities indicated that children were well matched to their latent class (.92 and .99, respectively). For overt aggression, one latent class trajectory represented a small proportion of children ($n = 34$; 6.8%), with a high chronic level of overt aggression from age 4.5 to 10.5 years (see Table S4). The second latent class trajectory represented the majority of children ($n = 469$; 93.2%), and showed a low decreasing trajectory of overt aggression from 4.5 to 10.5 years. The posterior probabilities indicated that children were well matched to their latent class (.95 and .99, respectively). These LGMMs were used as the starting point for the sequential process models.

Table S1

Descriptive Statistics for Peer Victimization and Aggression at Waves 1 to 6 and Psychopathology, Peer, and Social-Cognitive Factors at Wave 1

Variables	α	N	M	SD	Range
Relational Victimization (CR)					
Wave 1	.69	400	0.55	0.48	0.00-2.00
Wave 2	.72	428	0.42	0.44	0.00-2.00
Wave 3	.78	436	0.40	0.47	0.00-2.00
Wave 4	.73	374	0.39	0.42	0.00-2.00
Wave 5	.80	366	0.35	0.43	0.00-2.00
Wave 6	.76	371	0.34	0.39	0.00-2.00
Overt Victimization (CR)					
Wave 1	.75	400	0.58	0.51	0.00-2.00
Wave 2	.74	428	0.47	0.46	0.00-2.00
Wave 3	.80	436	0.41	0.46	0.00-2.00
Wave 4	.78	373	0.42	0.45	0.00-2.00
Wave 5	.81	367	0.39	0.45	0.00-2.00
Wave 6	.72	371	0.37	0.39	0.00-2.00
Relational Aggression (PN)					
Wave 1	na	473	0.07	0.10	0.00-0.58
Wave 2	na	473	0.06	0.10	0.00-0.50
Wave 3	na	473	0.05	0.10	0.00-0.68
Wave 4	na	503	0.03	0.07	0.00-0.44
Wave 5	na	503	0.03	0.07	0.00-0.50
Wave 6	na	503	0.03	0.08	0.00-0.50
Overt Aggression (PN)					
Wave 1	na	473	0.07	0.14	0.00-1.00
Wave 2	na	473	0.07	0.12	0.00-0.80
Wave 3	na	473	0.07	0.13	0.00-0.90
Wave 4	na	503	0.04	0.10	0.00-0.75

(Table S1 continued.)

Variables	α	N	M	SD	Range
Wave 5	na	503	0.05	0.12	0.00-1.00
Wave 6	na	503	0.05	0.12	0.00-0.64
Psychopathology					
Internalizing Problems (CR) W1	.90	377	0.70	0.41	0.00-2.00
Hyperactive Behaviors (TR) W1	.91	300	0.65	0.67	0.00-3.00
Peer Relations					
Peer Likeability (PN) W1	na	473	0.20	0.22	0.00-1.00
Aggressive Social-Cognitions					
Hostile Attributions (CR) W1	.50	401	0.33	0.26	0.00-1.00

Note. CR = child report. TR = Teacher report. PN = peer nomination. na = not applicable. W1 = wave 1 (winter, year 1).

Table S2

Bivariate Correlations between Peer Relational and Overt Victimization and Aggression

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	23	24
Relational Victimization																							
1. Wave 1																							
2. Wave 2	**.43***																						
3. Wave 3	**.29***	**.47***																					
4. Wave 4	**.26***	**.33***	**.50***																				
5. Wave 5	**.23***	**.34***	**.45***	**.48***																			
6. Wave 6	**.24***	**.25***	**.33***	**.37***	**.46***																		
Overt Victimization																							
7. Wave 1	.68*	.40*	.28*	.28*	.20*	.23*																	
8. Wave 2	.33*	.68*	.43*	.27*	.30*	.26*	**.41***																
9. Wave 3	.14*	.37*	.69*	.38*	.30*	.32*	**.26***	**.46***															
10. Wave 4	.21*	.28*	.36*	.74*	.46*	.35*	**.29***	**.38***	**.43***														
11. Wave 5	.24*	.31*	.41*	.45*	.74*	.43*	**.27***	**.42***	**.38***	.51*													
12. Wave 6	.10	.17*	.20*	.33*	.33*	.67*	**.19***	**.30***	**.26***	.41*	.45*												

(Table S2 continued.)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	23	24
Relational Aggression																							
13. Wave 1	.15*	.10*	.10*	.09	.10*	.14*	.16*	.11*	.10*	.12*	.10*	.11*											
14. Wave 2	.09	.09	.17*	.14*	.13*	.08	.07	.12*	.15*	.15*	.15*	.11*	**.38***										
15. Wave 3	.08	.05	.11*	.04	.07	.18*	.11*	.08	.09	.07	.08	.15*	**.48***	**.39***									
16. Wave 4	.18*	.11*	.12*	.14*	.16*	.12*	.12*	.06	.04	.14*	.13*	.03	**.20***	**.24***	**.22***								
17. Wave 5	.15*	.05	.03	.01	.01	.09	.11*	.07	.02	.05	.01	.06	**.23***	**.21***	**.27***	**.30***							
18. Wave 6	.09	.04	.04	.12*	.10*	.09	.10*	.06	.06	.12*	.06	.12*	**.25***	**.29***	**.26***	**.23***	**.50***						
Overt Aggression																							
19. Wave 1	.11*	.03	.07	.02	.01	-.04	.10*	.07	.06	.03	.00	.02	.47*	.45*	.32*	.25*	.25*	.25*					
20. Wave 2	.12*	.06	.11*	.11*	.14*	.05	.12*	.11*	.10*	.09	.09	.08	.50*	.53*	.43*	.25*	.34*	.40*	**.69***				
21. Wave 3	.07	.03	.09	.04	.05	.05	.12*	.10*	.11*	.08	.04	.09	.48*	.44*	.56*	.20*	.36*	.37*	**.67***	**.72***			
22. Wave 4	.10*	.05	.06	.12*	.11*	.04	.07	.09	.10*	.11*	.09	.09	.33*	.34*	.27*	.44*	.41*	.43*	**.54***	**.52***	**.51***		
23. Wave 5	.11*	.05	.05	.07	.05	-.03	.13*	.10*	.03	.06	.05	.00	.30*	.28*	.25*	.25*	.57*	.51*	**.47***	**.52***	**.50***	**.45***	
24. Wave 6	.05	.01	.02	.10*	.08	.01	.07	.06	.08	.14*	.07	.07	.27*	.29*	.22*	.25*	.46*	.69*	**.41***	**.49***	**.49***	**.50***	**.66***

Note. Stability coefficients shown in boldface. *$p < .05$.

Table S3

Model Fit Indices of the Peer Victimization and Aggression Latent Growth Mixture Models

Model Identified	Overall		Girls		Boys	
	BIC	Entropy	BIC	Entropy	BIC	Entropy
Relational						
Victimization						
1-Class Model	2507.16		1360.11		1154.26	
2-Class Model	**2445.11**	**.731**	**1334.10**	**.642**	**1134.43**	**.926**
3-Class Model	2468.84	.821	1349.36	.775	1156.45	.953
4-Class Model	2543.87	.920	1367.71	.814	1163.74	.952
Overt Victimization						
1-Class Model	2675.05		1361.99		1344.66	
2-Class Model	**2634.69**	**.645**	**1353.88**	**.612**	**1315.01**	**.852**
3-Class Model	2648.91	.774	1371.46	.742	1327.16	.902
4-Class Model	2646.27	.527	1393.65	.796	1335.00	.893
Relational Aggression						
1-Class Model	-5988.63		-3357.20		-2664.77	
2-Class Model	**-6383.85**	**.942**	**-3506.29**	**.961**	**-2864.18**	**.976**
3-Class Model	-6358.94	.964	-3547.76	.951	-2900.52	.746
4-Class Model	-6517.94	.838	na		-2878.50	.798
Overt Aggression						
1-Class Model	-5347.81		-3322.80		-1322.56	
2-Class Model	**-5598.80**	**.973**	**-3609.11**	**.984**	**-1705.25**	**.961**

3-Class Model	-5713.21	.981	-3740.13	.939	-1825.57	.858
4-Class Model	-5842.50	.967	-3564.50	.238	-1803.06	.514

Note. Best-fitting LGMMs shown in boldface. Na = not applicable as model did not converge.

Table S4

Growth Factor Estimates from the Accelerated Latent Growth Mixture Models for Peer Victimization and Aggression

Latent Trajectory Class	*n* (%)	Intercept		Linear Slope		Quadratic Slope		Class Probability
		Est.	*SE*	Est.	*SE*	Est.	*SE*	
Relational Victimization								
High Chronic	98 (19.5%)	0.79**	.19	0.20	.14	-0.06*	.03	.860
Moderate Decelerating	404 (80.5%)	0.54**	.05	-0.22**	.05	0.04**	.01	.936
Overt Victimization								
High Chronic	121 (24.1%)	1.17**	.13	-0.17	.11	0.01	.03	.807
Low Stable	382 (75.9%)	0.39**	.04	-0.06	.03	0.01	.01	.916
Relational Aggression								
High Chronic	37 (7.4%)	0.19**	.03	0.11**	.04	-0.05**	.01	.920
Low Decreasing	466 (92.6%)	0.05**	.01	-0.01**	.01	0.00	.00	.989
Overt Aggression								
High Chronic	34 (6.8%)	0.22**	.12	0.21**	.06	-0.06**	.01	.945
Low Decreasing	469 (93.2%)	0.11**	.02	-0.04**	.02	0.01*	.00	.996

Note. *p < .05. **p < .01.