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Peer Influence on Aggression at School: How Vulnerable are Higher-risk Adolescents?

Abstract

Adolescent students with high levels of antisocial behavior are at increased risk for future psychosocial problems and can be expected to be especially vulnerable to negative peer influence. This study therefore examined whether higher-risk students are more susceptible than lower-risk students to classroom peer influence on aggression. Analyses were based on anonymous self-reports from 792 students in 55 classrooms at four data collection points that span the beginning (T1) to the end (T4) of Grade 7. The mean age at T1 was 13.12 years (*SD* = 0.48) and 52.7% of the participants were boys. Students' risk status was assessed using a norm-based cutoff score from a standardized screening instrument. Multilevel analyses revealed that the aggression scores of higher-risk students showed larger increases than those of other adolescents, and that this difference was dependent on higher aggression levels among classmates. These results suggest that higher-risk students may be particularly vulnerable to high levels of aggression in classrooms, whereas low levels of aggression in classrooms may be protective.

Keywords*:* aggression, adolescents, higher-risk, peer influence, classmates

Antisocial behavior among adolescents is characterized by recurrent violations of socially prescribed norms in public settings, at home, or in school environments (Simcha-Fagan, Langner, Gersten, & Eisenberg, 1975). This behavior includes "physical or verbal abuse of a person, damage to or theft of property, or victimless clandestine juvenile behaviors such as truancy and drug or alcohol use" (Loeber, 1985). This definition corresponds with the behavioral descriptions of conduct disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013), which refer to aggression, destruction of property, deceitfulness or theft, and serious violations of rules. Although not all categories of antisocial behavior need to be present in conduct disorder at the same time, aggression and delinquency often co-occur (e.g., r = .616 in a study by Barnow, Lucht, & Freyberger, 2005). The negative consequences of antisocial behavior affect more than just the social environment—they also affect the youths in question. For example, youth who exhibit pronounced antisocial behavior are more likely to engage in criminal behavior in the future (e.g., Monahan, Steinberg, Cauffman, & Mulvey, 2009) and to experience school failure, psychological disorders, and social rejection (Quinn & Poirier, 2004). Adolescents who exhibit high levels of antisocial behavior can therefore be considered to be at increased risk for future negative outcomes and are in need of support. Hereafter, we refer to this group of adolescents as "higher-risk adolescents".

Peer groups strongly contribute to antisocial behavior development (for overviews, see Dishion & Tipsord, 2011; Brechwald & Prinstein, 2011). Because adolescents spend a lot of time at school, a substantial degree of peer influence on antisocial behaviors occurs within the school context, particularly among classmates (e.g., Araos, Cea, Fernández, & Valenzuela, 2014; Henry & Chan, 2010; Powers & Bierman, 2013; Thomas, Bierman, & Powers, 2011). Additional knowledge about the degree of susceptibility of higher-risk adolescents to negative peer influence from classmates could yield insights into appropriate

classroom compositions and the effectiveness of interventions aimed at classroom-level behavior. In this study, we investigate the question of susceptibility to peer influence among higher-risk students with regards to aggressive behavior. Compared with delinquency, which is often practiced covertly (Loeber, 1985), aggression occurs more frequently in school contexts, and previous studies have reported increased rates of aggression among higher-risk students (e.g., van Goozen, Mattyhs, Cohen-Kettenis, Thijssen, & van Engeland, 1998).

Classmates' Influence on Aggressive Behavior

Aggressive behaviors in adolescents can have various causes. In most cases, several risk factors are involved. However, negative peer influence typically plays a central role (Dishion & Tipsord, 2011). An important mechanism is that adolescents adapt their own behavior to the descriptive norms among their peers. Such norms indicate what is considered the "normal" behavior within a group (Cialdini, Kallgren, & Reno, 1991). Descriptive norms regarding aggression are typically operationalized as the mean levels of aggressive behaviors in a group (e.g., Henry et al., 2000). Evidence from social learning theory suggests that descriptive norms in a group can influence an individual's level of aggressive behavior via processes such as imitation, social comparison, and reinforcement from group members (Akers, 2009; Bandura & Walters, 1963; Burgess & Akers, 1966). These processes often occur among friends but have also been found among classmates (Dishion & Tipsord, 2011). Several studies have suggested that descriptive classroom norms regarding aggression contribute to individual development of aggressive behaviors (e.g., Barth, Dunlap, Dane, Lochman, & Wells, 2004; Powers & Bierman, 2013; Thomas et al., 2011; but see Henry et al., 2000). For example, Powers and Bierman (2013) found that higher mean aggression levels in classrooms were correlated with higher future levels of individual aggressive behaviors, even when controlling for individual students' baseline aggression level. Therefore, it can be assumed that if descriptive classroom norms favor aggressive behavior,

there is an increased risk that individual students will adopt these norms as a reference and exhibit aggression in the future.

Susceptibility of Higher-Risk Students to Classmates' Aggression

There is only a limited body of knowledge pertaining to whether higher-risk students have increased susceptibility to their classmates' aggression. Generally, different factors associated with students' higher-risk status may affect their peer influence susceptibility. For example, individuals with high levels of antisocial behaviors often exhibit greater impulsiveness (Luengo, Carrillo-de-la-Peña, Otero, & Romero, 1994), which in turn is associated with a greater susceptibility to peer influence (Gardner, Dishion, & Connell, 2008). Furthermore, higher-risk students in high-aggression classrooms may feel more encouraged to exhibit aggressive behaviors because behaving this way is considered normative in this context (see also Cialdini et al., 1991). This line of argument is supported by findings that students' aggression is only associated with peer rejection in low-aggression classrooms but not in high-aggression classrooms (Stormshak, Bierman, Bruschi, Dodge, Coie, & Conduct Problems Prevention Research Group, 1999). Higher-risk students therefore have to expect less socially aversive reactions from peers for exhibiting aggressive behaviors in high-aggression classrooms. Additionally, it has been shown that aggression is often related to popularity during early adolescence (e.g., Dijkstra, Lindenberg, Verhulst, Ormel, & Veenstra, 2009). For higher-risk students, who possess a reduced repertoire of socially competent behaviors and often exhibit reduced levels of academic achievement (Crick & Dodge, 1996; Nelson, Benner, Lane, & Smith, 2004), aggression may therefore be a possible and relatively accepted way to increase their social status in high-aggression classrooms. In addition, studies have found that higher-risk individuals can influence one another negatively in reciprocal reinforcement processes (i.e., deviancy training) that predict increases in individual problem behaviors over time (Dishion & Tipsord, 2011). Hence, in classrooms

with high levels of aggressive behaviors, increased rates of deviant talk among higher-risk students can be assumed to have an adverse effect on these students' aggression development.

Based on the described processes, we would expect that higher-risk students are particularly susceptible to classmates' aggressive behaviors. However, empirical studies explicitly testing this expectation have been rare and inconclusive. For example, Warren, Schoppelrey, Moberg, and McDonald (2005) found that the aggressive behavior of highly aggressive elementary-school students (in grades 1–4) in aggressive classrooms increased significantly; the behavior of low-aggressive students did not change. Higher-risk students in this study were identified by a median split of parent-rated baseline aggressive behavior. The results of Warren et al. (2005) extend previous findings of a classroom aggression effect for higher-risk boys in grades 1–6 (Kellam, Ling, Merisca, Brown, & Ialongo, 1998). In this study higher-risk students were determined using teacher ratings in the top quartile of aggressive behavior at baseline. In contrast, Adams et al. (2005) found that aggressive students (assessed using peer nominations) in grade 6 with aggressive friends remained stable in their aggression level; students with non-aggressive friends declined in aggression. This study speaks to a potentially protective effect of non-aggressive peers rather than to a reinforcing effect of highly aggressive peers. Still another effect was reported by Boxer et al. (2005) for students in grades 3–6. These authors found that the more an individual student's aggression level differed from that of his or her peers' baseline aggression level, the more susceptible that student was to peer influence. In other words, students changed their behavior in the direction of their peer group's aggression level (i.e., some students became less aggressive and some students became more aggressive). In this study, the authors used median units of baseline peer and teacher ratings to distinguish between higher- and lower-risk students.

Although all of the just reported studies have yielded important results, the contradictory findings regarding the susceptibility of higher-risk students cannot be easily explained. Some inconsistencies may be related to differing research designs (three out of four of these studies were part of intervention studies) and discrepancies in the durations between the time points considered in the analyses (ranging from 6 months to 6 years between the pre- and post-tests). It is also important to note that none of the studies used norm-based cutoff scores to determine students' risk status (instead, sample-based median and quartile splits were used). Therefore, the inconsistent results may also be related to differences in the absolute levels of aggression in the samples investigated. Finally, researchers used different approaches to handle the variable of student gender. For example, gender was controlled for by Warren et al. (2005) but not by Adams et al. (2005). Kellam et al. (1998) used separate analyses for boys and girls. Since boys and girls are known to differ in aggressive behaviors and are also differentially affected by exposure to negative peer influence (e.g., Mears, Ploeger, & Warr, 1998), the studies' varied approaches for handling gender may have also contributed to the different results.

The Current Study

The present study investigated, whether higher-risk students' aggressive behavior is more influenced by levels of aggression among their classmates than lower-risk students' aggressive behavior. To address some of the open questions related to earlier studies' research designs, determinations of students' risk status, and analysis strategies, we applied a non-intervention design following students' behavioral development right after they switched to a new classroom peer context in secondary school. We chose an early adolescent sample since peer influence is known to play a particularly important role during this developmental period (Thornberry, 1987). Furthermore, we used norm-based cutoff scores from a standardized instrument to determine students' risk status so that risk could be estimated

independently of the characteristics of the investigated sample. In order to generalize our findings across boys and girls, we controlled for students' gender in our analyses.

Methods

Participants

The data were obtained from a longitudinal study conducted in the German part of a bilingual (German/French) canton of Switzerland. These data are particularly useful for testing our hypothesis since the study design allowed us to investigate changes in 7th graders' individual aggression levels across relatively short time intervals. As classrooms were self-contained and had been newly composed after the students finished primary school (grades 1–6), students started grade 7 in a new peer environment. It was therefore possible to examine the effects of classmates' aggression at baseline and draw conclusions about the role of classroom composition on students' development in a new peer context. Due to a close collaboration between the university and the local Department of Education, all eight schools with 7th graders and all 55 classrooms participated in the study. Therefore, we examined a nearly complete cohort of 7th-grade students. We used data collected at four measurement points across the school year (T1: September 2011, T2: November 2011, T3: February/March 2012, T4: May/June 2012). The students' mean age at T1 was 13.12 years (*SD* = 0.48 years), and 52.7% of the participants were male. The data included all students who participated at T1 and who could therefore be classified into a higher-risk or lower-risk group at baseline. At T1, *N* = 792 students took part in the study (i.e., 95.6% out of the complete cohort of *N* = 828). Of these 792 students, 97.9% (*N* = 775) also participated at T2, 95.6% (*N* = 757) participated at T3, and 96.1% (*N* = 761) participated at T4. Most students came from rural regions; only one school (*N* = 105 7th-grade students; 13.3%) was located in a town with more than 10,000 inhabitants. Participants were asked to report whether they owned a Swiss passport, a foreign passport, or both. Within our sample, 77.8% of students (*N* = 616) had a

Swiss passport only, 12.1% (*N* = 96) had a Swiss passport and a foreign passport, and 9.1% (*N* = 72) had a foreign passport only. Socioeconomic status was measured using the International Socioeconomic Index of Occupational Status (ISEI, Ganzeboom & Treiman, 1996) and coded using the higher-rated occupation of a student's two parents. The average ISEI in the sample was 49.09 (*SD* = 16.05), which corresponds to the national Swiss average (Vellacott, Hollenweger, Nicolet, & Wolter, 2003). Students were grouped according to achievement criteria into an advanced track (*N* = 227; 28.7%), a general track (*N* = 329; 41.5%), a basic track (*N* = 188; 23.7%), and a special educational track for students with learning difficulties (*N* = 48; 6.1%). Students remained in their tracked self-contained classrooms for almost all lessons and were therefore exposed to the same classmates for the entire school year. Each classroom had one primary teacher, but students also attended lessons in certain subjects taught by other teachers. The average classroom size at T1 was 17.54 students (*SD* = 3.57 students, range = 8–24 students) and differed by academic track (advanced track: *M* = 17.14 students, *SD* = 2.22 students, range = 15–22 students; general track: *M* = 20.31 students, *SD* = 2.04 students, range = 17–24 students; basic track: *M* = 15.23 students, *SD* = 2.12 students, range = 12–18 students; special educational track: *M* = 9.54 students, *SD* = 1.53 students, range = 8–12 students).

Measures

Risk group. We used the results of the subscale "Antisocial Behavior" of the German version of the Reynolds Adolescent Adjustment Screening Inventory (RAASI; Hampel & Petermann, 2005; Reynolds, 2001), measured at T1, to categorize the sample into a higher-risk group and a lower-risk group. This subscale measures self-reported antisocial behaviors such as consuming drugs or alcohol, staying out without a parent's knowledge (or longer than declared), violating school or home rules, doing bad things intentionally, experiencing problems at home or in school, not doing homework, and breaking the law. The inventory

included queries such as, “In the last six months, I did things that were against the law.” Participants rated the frequency of their behavior on a 3-point scale (0 = *never or almost never*, 1 = *sometimes*, and 2 = *almost always*). Possible scores ranged from 0–16. The German RAASI can be used as part of a broader assessment of psychological problems. However, it is important to emphasize that results from this instrument alone cannot be used to determine a psychological disorder. According to the test manual, adolescents can be divided, based on T-values and percentage ranks, into the groups “no behavioral problems” ($T < 60$; $PR = 0–82$), “mild problems” ($T = 60–64$; $PR = 84–92$), “moderate problems” ($T = 65–69$; $PR = 93–97$), and “severe problems” ($T \geq 70$; $PR \geq 98$). In this study, students with mild-to-severe problems were classified as higher-risk students.

The original American version of the RAASI was standardized and evaluated using a population-based sample of 1,827 adolescents (Reynolds, 2001). In this evaluation, an internal consistency of $\alpha = .81$ and a two-week retest reliability of $r = .85$ in a sample of $N = 65$ for the Antisocial Behavior subscale was found. In addition, a good factorial validity can be assumed since the four-factor structure (antisocial behavior, anger control, emotional distress, and positive self) was confirmed in studies with $N = 2{,}333$ typically developing adolescents and adolescents with psychological problems (Reynolds, 2001). The German version of RAASI was standardized and evaluated on the basis of a population-based sample of $N = 1{,}076$ adolescents (ages 11–16) enrolled in grades 6–9 in higher- or lower-achieving academic tracks. Distributions of student gender did not differ between grade levels. As for the original version, a four-factor structure and satisfactory internal consistency was found ($\alpha = .78$) for the Antisocial Behavior subscale (Hampel & Petermann, 2005). Furthermore, strong correlations in the expected directions (between $r = .53$ and $r = .62$) with comparable subscales of the Youth Self-Report version of the Child Behavior Checklist (Achenbach, 1991) indicated convergent validity. Additional analyses revealed that adolescents with a

diagnosed psychological disorder (N = 52) scored significantly higher on all subtests of the RAASI compared with a sample of typically developing adolescents (Hampel & Petermann, 2005). The results of the current study revealed satisfactory internal consistency of the Antisocial Behavior subscale (α = .84).

Individual aggression. The dependent variable individual aggression was measured at all four measurement occasions using a subscale of the self-report version of the Fribourg Self- and Peer-Report Scales – Antisocial Behavior (FSP-A; Müller, 2013). In the FSP-A, students anonymously self-report the number of days over the last two weeks that they exhibited a specific behavior (e.g., "Think of the last 14 days [date provided]. On how many of those days did you hit or kick others or cause them physical harm in other ways?"). The relatively short rating period of 14 days makes it possible to conduct repeated measurements across the school year, and it also reduces the potential for memory bias. The aggression scale contains 9 items that measure the following behaviors: directly aggressive acts (e.g., hitting/kicking, pushing around, threatening, annoying, or insulting others), indirectly aggressive acts (e.g., spreading rumors about others, playing someone off someone else), and oppositional behaviors (e.g., fierce arguments with others or feeling very angry). The behaviors described are not limited to the school context. While in early adolescence the majority of behaviors can be expected to occur among peers, some behaviors may also be directed toward adults.

The FSP-A self-reports were evaluated for 552 7th–9th graders (Müller, 2013). A one-factor structure of the scale and good internal consistency (α = .84) was found. Validity was further indicated by the finding that classroom-aggregated values of the self-reports ("How many days during the last 14 did you do …?") correlated strongly with classroom-aggregated values of peer reports ("How many of your classmates did … at least once during the last 14 days?", r = .79; p < .001). Moreover, classroom-aggregated self-reports were significantly

correlated with teachers' perceptions of the global level of psychosocial difficulties observed in the classrooms (r= .58; p < .001). In the current study, the internal consistency was α = .75 at T1, α = .82 at T2, α = .80 at T3, and α = .82 at T4.

Classmates' aggression. Classmates' aggression at T1 was calculated for each student by averaging all students' FSP-A scores in a given class, excluding the respondent's own score. Hence, each student had a context score of his or her classmates' mean level of aggression. This procedure is typically used to represent a descriptive classroom norm for aggression (e.g., Henry et al., 2000).

Gender. Students self-identified as male or female.

Time. Measurement occasions were used as an indicator of time.

Procedure

The local Department of Education and the university sent a letter to students and parents informing them about the study and the voluntary nature of their participation. The letter stressed that all student data would be completely anonymous and that only the research team would use the data. Students and parents could opt out of the study at any time. Trained research assistants introduced the questionnaire to students in detail, emphasizing that no individual data would be given to teachers or parents. After a student agreed to participate, he or she filled out the questionnaire while surrounded by mobile blinds to ensure optimally independent answers. We never had access to any student names. In order to anonymously track individual trajectories through the data-collection time points, we used codes.

Statistical Analyses

We started with descriptive statistics of the key variables: individual aggression, classmates' aggression, and gender. We calculated the statistics with regard to the entire sample and the two student groups (higher-risk and lower-risk). Further, we provide information about the severity of problems in the higher-risk group.

In our main analyses, we have considered the hierarchical data structure (Raudenbush & Bryk, 2002). Repeated measures were not independent since they were nested within individuals, and individuals were nested within classrooms. That is, measures within the same person and persons within the same classroom are likely more similar relative to measures between persons and between classrooms. Since this situation might lead to biased results, we estimated multilevel models controlling for clustering within higher-level units. In these models, repeated measures within individuals represented Level 1, individual students represented Level 2, and classrooms represented Level 3. The variables of interest were either at Level 1 (i.e., change over time in individual aggression) or at Level 2 (i.e., gender, risk group, and classmates' aggression). Although classmates' aggression relates to the classroom context, each student had his or her own surrounding classmates' aggression score (i.e., Level 2). Analyses were conducted using MLwiN version 2.36 software (Rasbash, Charlton, Browne, Healy, & Cameron, 2009).

Because we were interested in the development of aggression over the school year, we conducted multilevel analyses for change (Singer & Willett, 2003). In such analysis models, the change in the dependent variable over time (i.e., over the measurement occasions) is predicted by independent variables. In a stepwise procedure, we first investigated the main effects of the independent variables. Second, we tested the interaction between risk groups (higher-risk vs. lower-risk) and change over time to reveal whether higher-risk students exhibited greater increases in aggression than lower-risk students. Finally, to answer our main research question of whether higher-risk students exhibited greater increases in aggression than lower-risk students depending on classmates' level of aggression we tested the three-way interaction among time, risk group, and classmates' aggression at T1.

Results

Descriptive statistics. Of the total sample (*N* = 792), 57 students (7.2%) were classified as higher-risk according to the RAASI criterion of antisocial behavior *PR* ≥ 84. This result implies that fewer higher-risk students were identified than German test norms would indicate (i.e., 16%). This finding confirms the importance of using norm-based cutoff scores in order to avoid overestimation in population-based samples. The relatively low percentage of students with high levels of antisocial behaviors may be related to the rural location of the schools in this study and the relatively high provision of psychosocial services for students in Swiss schools. Within the higher-risk group, 59.6% of students exhibited minor problems, 35.1% exhibited moderate problems, and 5.3% exhibited severe problems, according to the RAASI criteria. The mean percentage of higher-risk students per classroom was 8.85 (*SD* = 9.73; range = 0–37.50). In the advanced track, 3.5% of students (*N* = 8) were classified as higher-risk. In the general track, 5.5% of students (*N* = 18) were classified as higher-risk. In the basic track, 13.8% of students (*N* = 26) were classified as higher-risk. In the special educational track, 10.4% of students (*N* = 5) were classified as higher-risk. The mean RAASI Antisocial Behavior score of higher-risk students was 5.84, compared with 0.97 among lower-risk students (the theoretical scale maximum was 16).

Our results revealed rather low incidences of aggression in the total sample, with scale means between 0.46 and 0.63 across measurement points. At T1, for example, on average each of the aggressive behaviors described in the scale were exhibited on 0.46 days; the theoretical maximum would have been 14 days. However, the range was 0–9.13 days, which indicates that some students exhibited high frequencies of aggression. When the two risk groups were considered separately, the mean aggressive behavior values across measurement occasions fell between 1.07 (*SD* = 1.35) and 1.57 (*SD* = 2.06) in the higher-risk group and between 0.39 (*SD* = 0.63) and 0.57 (*SD* = 0.86) in the lower-risk group. At T1, classmates'

aggression (i.e., aggression level of the surrounding peers) for the higher-risk students was $M = 0.55$ ($SD = 0.27$) and $M = 0.46$ ($SD = 0.21$) for the lower-risk students.

Hypothesis tests. Before we tested the effects of predictor variables, we estimated the amount of variance and the intraclass correlation (ICC) on Level 2 and Level 3 in a null model. The variance between measurement occasions within individuals (Level 1) was 0.494, between individuals (Level 2) 0.407, and between classrooms (Level 3) 0.025. All variances were significant ($p < .05$). The ICCs revealed that 43.9% of the total variance was due to differences between individuals and that 2.7% was due to differences between classrooms.

We next tested the primary effects of time and risk status on aggression development (see Table 1, Model 1). The entire sample exhibited a small but significant increase in aggression over the school year ($p < .05$) when controlling for risk status, classmates' aggression, and gender (no significant increase was found when we did not control for predictor variables; $B = 0.020$, $SE\ B = 0.011$, $z = 1.713$, $p = .087$). Furthermore, higher-risk students reported significantly more aggressive behaviors than lower-risk students ($p < .01$). The inclusion of the main effect of time and the individual-level variables risk status, classmates' aggression, and gender was associated with a proportional reduction in variance by 6.1% on Level 1 and 59.7% on Level 2 (according to the procedure of Snijders & Bosker, 1994). At the same time, the inclusion of the Level 2 variable classmates' aggression was associated with an increase in variance on Level 3 (from 0.025 to 3.613). An increase in variance on a higher level when including variables on lower levels is not unusual in multilevel models (Snijders & Bosker, 1994). In this case, the increase may be related to the fact that classmates' aggression is an individual-level variable based on classroom aggregates excluding the respondent's own score.

In addition to the results presented in Table 1, we tested a two-way interaction between risk group and time with otherwise identical variables and no three-way interaction.

Overall, higher-risk students did not exhibit significantly larger increases in aggression than lower-risk students across the school year (B = -0.049, $SE\ B$ = 0.044, z = -1.116, p = .264). When the three-way interaction among time, risk status, and classmates' aggression was included in the model, the same effect became significant ($p < .01$; see Table 1, Model 2). However, the two-way interaction changes its meaning in the presence of the three-way interaction—it now indicates the difference between higher-risk and lower risk-students regarding change over time in aggression, when classmates' aggression is zero. Therefore, if there is no aggression among classmates, higher-risk students decline more (or increase less) in individual aggression than lower-risk students. Furthermore, the three-way interaction among time, risk group, and classmates' aggression reveals that higher-risk students exhibit significantly larger increases in aggression than lower-risk students, depending on higher aggression levels among classmates ($p < .01$; see Table 1, Model 2). This means that, consistent with our expectation, higher-risk students were more negatively influenced by the aggressive behavior of their classmates than lower-risk students. At the same time, higher-risk students were also more positively influenced by the absence of aggression than lower-risk students. Figure 1 illustrates this effect by dichotomizing the aggressive behavior of classmates into high-aggression ($\geq 1\ SD$) and low-aggression ($< 1\ SD$) classrooms. Although some interaction effects were significant, their inclusion did not explain much additional variance. The variance between individuals remained the same, and the variance within individuals declined slightly from 0.464 to 0.462.

In order to determine the stability of the effect of greater peer influence susceptibility among higher-risk students, we carried out sensitivity analyses that included additional school-related variables. Classroom size differed across classrooms and across academic tracks, and academic tracks varied in terms of the proportion of higher-risk students. Because these contextual factors could affect classroom interactions and peer influence, the analyses

used to test our hypotheses were replicated with classroom size and academic track included. Our results revealed that the significant positive three-way interaction among time, risk group, and classmates' aggression used to test our hypothesis was unaffected by the inclusion of the two variables (B = 0.450, $SE\ B$ = 0.166, z = 2.709, p = .007, η^2 = .002). The effects of classroom size and academic track were not significant in the final model, and the variance on the classroom level was only slightly reduced from 3.607 (Model 2, Table 1) to 3.406. When we only included classroom size or academic track as predictor of aggressive behavior, classroom size still had no effect. However, students from the basic academic track exhibited significantly more aggressive behavior than students from any of the other tracks (p < .01).

Table 1

Multilevel Analyses Predicting Individual Aggression From T1 to T4 by the Main Effects of Time, Risk Group (Higher-risk vs. Lower-Risk), and Classmates' Aggression at T1 (Model 1) and by the Three-Way-Interaction Interaction of Time, Risk Group (Higher-risk vs. Lower-risk), and Classmates' Aggression at T1 (Model 2)

	Model 1: Main Effects					Model 2: Three-Way Interaction				
	Para-meter	*SE*	*z*	*p*	η^2	*Para-meter*	*SE*	*z*	*p*	η^2
Fixed Effects										
Intercept	3.806	0.310	12.270	< .001	-	3.839	0.313	12.265	< .001	-
Time	0.022	0.011	2.029	.043	0.001	-0.004	0.028	-0.143	.886	0.000
Higher-risk student	0.366	0.082	4.461	< .001	0.007	0.804	0.231	3.481	.001	0.004
Classmates' aggression T1	-6.969	0.343	-20.310	< .001	0.136	-7.051	0.356	-19.806	< .001	0.129
Male gender	0.075	0.040	1.901	.057	0.001	0.075	0.040	1.875	.061	0.001
Time*higher-risk	-	-	-	-	-	-0.289	0.099	-2.919	.004	0.003
Time*classmates' aggr. T1	-	-	-	-	-	0.063	0.055	1.145	.252	0.000
Higher-risk*classmates' aggr. T1	-	-	-	-	-	-0.682	0.387	-1.762	.078	0.001
Time*higher-risk*classmates' aggr. T1	-	-	-	-	-	0.446	0.166	2.688	.007	0.002
Variance Components	-	-	-	-	-					
Level 1 (within individuals)	0.464	0.014	33.143	< .001	-	0.462	0.014	33.000	< .001	-
Level 2 (between individuals)	0.164	0.015	10.933	< .001	-	0.164	0.015	10.933	< .001	-
Level 3 (between classrooms)	3.613	0.690	5.236	< .001	-	3.607	0.689	5.235	< .001	-

Discussion

Previous studies have demonstrated that the level of aggressive behaviors among classmates is a significant predictor of individual students' development of such behaviors (e.g., Barth et al., 2004; Powers & Bierman, 2013; Thomas et al., 2011). Our analyses reveal that higher-risk students are more susceptible than lower-risk students to the influence of aggressive behavior among classmates.

Our preliminary results suggest similar changes in aggressive behaviors between higher- and lower-risk students in grade 7. However, differences in aggression development between the two groups became apparent when we considered the role of classroom aggression: Higher-risk students exhibited larger increases in aggressive behavior than lower-risk students when studying in classrooms with a higher level of aggression. Although the effect was small, this difference indicates that students at higher risk of antisocial behavior are particularly vulnerable to the influence of aggressive behavior by their classmates. However, this situation also applies in the opposite sense: If less aggressive behavior is exhibited in the classroom, the individual aggressive behavior of higher-risk students decreases proportionally more than that of lower-risk students. These findings, which are consistent with those of Kellam et al. (1998) and Warren et al. (2005), extend these authors' findings to 7th graders and higher-risk boys and girls identified using a norm-based cutoff score.

A variety of processes may underlie the increased peer influence susceptibility of higher-risk students. To begin with, higher-risk students may feel encouraged to engage in aggression when aggressive behavior is normative in their classroom. Furthermore, potentially increased impulsiveness among these students may contribute to a willingness to go along with their peers' aggressive behaviors in these settings (see also Gardner et al., 2008). Also, aggression in early adolescence is known to be one factor associated with popularity among classmates (e.g., Dijkstra et al., 2009; Jonkmann, Trautwein, & Lüdtke, 2009). As higher-risk students often lack alternative possibilities for gaining popularity (e.g.,

high social competence), these students may view aggression as a means for becoming popular. This process can be expected to be even stronger in classrooms with highly aggressive descriptive norms because aggressive behavior is more accepted in these settings (Jonkmann et al., 2009). An additional explanation relates to deviancy training. Early adolescents with high levels of antisocial behaviors are known to exhibit an increased openness to engaging in deviancy training when paired with deviant peers (Dishion, Spracklen, Andrews, & Patterson, 1996). Therefore, higher-risk students may experience more frequent peer reinforcement for deviant talk in high-aggression classrooms than in low-aggression classrooms, which in turn can be expected to influence their future aggressive behavior. Given that we were not able to explore these explanations with our data, future research should focus on identifying which mechanism underlies higher-risk adolescents' increased susceptibility to their classmates' influence.

Practical Implications

Knowledge of higher-risk students' greater susceptibility to peer influence has several implications. One concerns the optimal classroom composition for facilitating positive development in students with antisocial behavior problems. Our results suggest that, in order to prevent negative peer influence, it may be preferable to avoid forming classrooms in which a large proportion of students exhibit high levels of aggressive behaviors. However, this conclusion must be interpreted with caution since most of the classrooms we studied included only a small proportion of students who could be considered higher-risk; mean aggression levels were furthermore generally low. In addition, the effect of classroom composition may depend on various factors. For example, the school system in which this study took place did not provide special needs classrooms designed specifically for students with behavioral problems. Although high levels of aggressive behaviors among adolescents can be expected in such specialized classrooms, students may also benefit from high levels of structure,

professional adult supervision, and special educational support that may reduce negative peer influence (see also Mathys & Born, 2009). It is therefore important to examine the effects of classroom composition in different types of regular and special needs classrooms, and to shed more light on contextual characteristics that act as moderating factors.

The evidence that higher-risk students benefit from class environments with little aggressive behavior emphasizes the value of preventive strategies enacted on the classroom level. Classroom-based strategies typically aim to influence positively the characteristics of the whole classroom peer ecology (Farmer, McAuliffe Lines, & Hamm, 2011; Farmer et al., 2018), and can be used in addition to approaches that focus primarily on individual students with behavioral problems (e.g., strengthening the students' social skills). For example, at-risk students' behavioral development may be more positive when teachers in their class are successful at both rejecting aggressive classroom-level norms and strengthening students' prosocial behaviors. In such classrooms, students with behavioral problems may have fewer social learning opportunities regarding aggression. In addition, those students seeking to increase their popularity may engage in aggressive behavior less often. A study by Hektner, August, and Realmuto (2003) that showed that aggressive children were positively influenced by their non-aggressive friends but not the other way around, further supports this prevention perspective.

Strengths, Limitations, and Future Directions

This study extends previous research by focusing on early adolescents with high levels of antisocial behavior whose risk status was determined using a norm-based cutoff score from a standardized measurement instrument. By measuring aggression frequently within a short-term longitudinal framework and using information from newly composed, self-contained classrooms, we were able to investigate the influence of classroom composition in a direct and valid way. Because we had access to all classrooms attended by a cohort of students from a

specific region and had high student participation rates, we could estimate classmates' influence based on a dataset well suited to examining our research question.

However, there are also limitations to this study. First, our classification of risk status would have benefited from additional information about the students' clinical diagnoses. Instead, we had to rely on students' anonymous self-reports regarding their behavior. Asking adolescents to report on the number of days rather than the number of times they exhibited aggressive behavior might have underestimated the frequency of such behaviors among higher-risk students. Although self-reports are generally suitable for measuring the short-term frequencies of clearly specified aggressive behaviors in adolescents (see also Orpinas & Frankowski, 2001), additional assessments from a teacher's or a classmate's perspective or direct observations would have further increased the reliability of our measures.

There is also the issue of the generalizability of our findings to other regions and school systems. Our sample was characterized by students with generally low levels of antisocial and aggressive behaviors. It would be informative to repeat our analyses in schools with higher levels of problematic behaviors among students. We expect that classrooms with a higher proportion of higher-risk students and higher absolute levels of aggression would yield more pronounced, negative effects. This expectation is supported by findings of better outcomes for juvenile offenders who experience settings with less contact with deviant peers compared with settings with more contact (Shapiro, Smith, Malone, & Collaro, 2010). However, as noted above, school-related factors, such as high levels of adult supervision and professional support, may buffer negative peer effects. It is therefore crucial to replicate our findings with regards to other regions and school types (e.g., classrooms specializing in higher-risk students).

The aspect of self-contained classrooms is another trait specific to the school system in which this study took place. This type of classrooms enabled us to investigate the influence of

one specific peer group for each student. However, in many school systems students change classrooms as they take different courses. Generally, the effect of classmates' influence on students' social-emotional development has been replicated across various international school systems (for an overview, see Müller & Zurbriggen, 2016). Nevertheless, it can be expected that when students often change their classroom context, they are influenced by more diverse descriptive classroom norms. Studies related to how different classrooms separately, or interactively, impact students' behavioral development would be valuable. This research could focus not only on the antisocial behaviors of higher-risk adolescents but also on the question of how classroom characteristics shape the development of these students' prosocial behaviors.

Finally, it would be fruitful to systematically investigate how negative peer influence on higher-risk students can be targeted in the school and classroom context. In doing so, the high susceptibility of students with behavioral problems to peer influences may be viewed not just as a risk factor. Instead, our results suggest that higher-risk students are also responsive to positive classroom peer ecologies characterized by low aggression. This perspective allows teachers to consider fostering a positive classroom peer environment as a measure that, paired with a teacher's support of individual students, may contribute to positive development for higher-risk adolescents.

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