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### At your own risk

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# CHAPTER 3

## Delinquency Influence in Peer Groups: The Role of Adolescents' Relative Social Status and Group Cohesion as Moderators\*

\* This chapter is co-authored with Jan Kornelis Dijkstra, Christian Steglich, Wilma Vollebergh, and René Veenstra and is currently under review by an international peer-reviewed journal. Earlier versions of this chapter were presented at the Society for Research in Child Development (SRCD), Seattle, WA, United States, April 2013, the Sunbelt Social Networks Conference, Hamburg, Germany, May 2013, and the European Conference on Social Networks (EUSN), Barcelona, Spain, July 2014.

### Abstract

Adolescent peer groups form an important setting where delinquency proliferates through peer influence. Although many studies have examined peer influence in delinquency in groups of adolescents, not so much is known about peer group characteristics that could enhance or inhibit the proliferation of delinquency. This study tested whether adolescents' *relative social status* and *structural cohesion* among peer group members are important moderators for the proliferation of delinquency among adolescents. We hypothesized that influence processes would be stronger for adolescents with a relatively low social status, compared to peers in their group, and in structurally cohesive peer groups. Hypotheses were tested in a sample of 1,309 students from the SNARE study (50.1% boys, *M* age = 13.19) using longitudinal social network analysis (RSiena). The results showed strong influencing processes, but no moderating effects for either relative social status or structural cohesion on peer influence in delinquency. These findings suggest that peer influence in adolescent delinquency is relevant across different settings, thus strengthening the pervasive nature of these processes.

Peer groups offer a social setting where adolescents spend a great amount of time with each other, find social support, and feel connected and accepted (see also Brown, 1990; Hartup, 1993; Kwon & Lease, 2007), but also provide a context where adolescents can influence one another with regard to risky behaviors, such as delinquency (Dishion et al., 1995; Henry et al., 2001; Patterson et al., 2000). To date, most research has focused on influence in delinquency in the overall peer network, showing that adolescents are strongly influenced by their peers to get involved in delinquent behaviors (e.g., Burk et al., 2008; Haynie et al., 2014; Kerr et al., 2012; Svensson et al., 2012; Weerman, 2011). Only a few studies have examined when peer influence processes are more or less likely to occur. Most of these studies focused on the impact of individual characteristics, such as psychopathic traits (Kerr et al., 2012) or immigrant status (Svensson et al., 2012).

However, besides individual characteristics, interpersonal processes might also play an important role in whether or not peer influence is likely. Adolescents mostly interact in intimate groups of peers, rather than the overall network (Brown & Klute, 2003; Gifford-Smith & Brownell, 2003; Hallinan, 1980; Rasmussen & Salkind, 2008; Wölfer & Cortina, 2014), and it is here where influence in delinquency is most likely (Dishion et al., 1995; Henry et al., 2001; Patterson et al., 2000). Therefore, we propose that not only individual characteristics, but also features of (individuals in) peer groups are potentially important factors for the enhancement or inhibition of peer influence in delinquency. Specifically, we aim to examine features of peer groups related to two important goals in adolescence: the goals for social status and belongingness (e.g., Buhrmester, 1990; Cillessen & Rose, 2005; Coleman, 1961; Rubin et al., 2006). On the one hand we will examine the vertical order of relations in peer groups: adolescents' *relative social status* (perceived popularity) compared to other peer group members as a moderator of peer influence processes in the realm of delinquency. On the other hand, we aim to examine the horizontal connections between group members: *structural cohesion* among peer group members (i.e., the extent to which members of a peer group are connected to one another) as a moderator.

### Peer Influence Processes

Two important goals for adolescents are social status and belonging. Social status, or perceived popularity, has shown to be of great importance in adolescence (Buhrmester, 1990; Cillessen & Rose, 2005; Jarvinen & Nicholls, 1996; Ojanen et al., 2005). Those with higher status are seen as more attractive for affiliation and have

the ability to exert power and influence over other individuals (Adler & Adler, 1998; Dijkstra et al., 2010; Eder, 1985; Merten, 1997; Parkhurst & Hopmeyer, 1998). Belongingness is of fundamental importance for adolescents to gain social support, become accepted, and for their social-emotional development (Baumeister & Leary, 1995; Buhrmester, 1990; Coleman, 1961; Juvonen, 2006; Newman et al., 2007; Rubin et al., 2006). Finding a place among peers reduces feelings of loneliness, is related to being more sociable and having higher self-esteem, and can prevent negative feelings such as anxiety and depression. An important way to achieve social status and belongingness is by imitating the behavior of high status others and conforming to other peer's behavior.

### **Social Status**

Adolescents attain status, or become popular, by displaying peer-valued characteristics associated with status, such as athletic ability, physical attractiveness and academic performance (e.g., Adler & Adler, 1995; 1998; Cairns & Cairns, 1995; Dijkstra et al., 2009; Eder & Parker, 1987), as well as displaying risky behaviors (Dijkstra, Lindenberg, & Veenstra, 2007; Dijkstra et al., 2009). Studies have shown that behaviors relevant to peer influence, such as delinquency, are associated with having high social status among peers (e.g., Allen, Porter, McFarland, Marsh, & McElhaney, 2005; Dishion, Poulin, & Burraston, 2001; Mayeux, Sandstrom, & Cillessen, 2008; Pattiselanno, Dijkstra, Steglich, Vollebergh, & Veenstra, 2015). Conversely, adolescents displaying lower levels of risky behaviors have on average lower social status than adolescents who engage more in risky behaviors.

Although adolescents with lower social status are less likely to display risky behavior, they may be more prone to be influenced in those behaviors, not only because higher status individuals can exert power and thus influence what lower status peers do, but also because lower status adolescents can be motivated to change their behavior to attain high status themselves (Cialdini & Richardson, 1980; Dijkstra et al., 2010). Other adolescents can increase their own social status by imitating peers who already have high status and bask in their reflected glory. By mimicking the behavior of popular others, adolescent have the chance to become popular themselves. This way, adolescents with higher social status tend not only to actively influence others, but also become role models to their peers and passively evoke imitation of their behavior by their peers.

Thus, if high status adolescents in peer groups display delinquent behavior, other peer group members, particularly the lower status ones, may imitate them. Higher status peer group members might function as role models who set the

norms and consequently evoke a tendency particularly in those lower in status to imitate their delinquent behavior. Accordingly, we expect susceptibility to peer influence in delinquency to be especially strong for adolescents with relatively lower social status in the peer group compared to the status of other peer group members, yielding stronger social mimicry of higher status members, compared to adolescents with relatively higher social status in the peer group (Hypothesis 1).

### Cohesion

Besides imitation of high status peers, conforming to peers' behavior in general is an important factor for achieving the goal of belonging. Conforming to "correct" behavior makes acceptance and belonging more likely (Coleman, 1961; Horne, 2001). A way by which individuals can conform to desirable behavior is by observing and imitating the behavior of others (Bandura & McClelland, 1977; Cialdini et al., 1991; Keizer, Lindenberg, & Steg, 2008). Particularly in new or ambiguous situations, observing behavior is an important means of behavioral conformity. If a context approves of deviant behavior and considers it the norm, individuals will be more likely to imitate that behavior (Akers, 1977; 2009; Sutherland et al., 1992). Particularly in adolescence, deviant behavior such as delinquency becomes more normative (Moffitt, 1993), and thus has a higher chance of being imitated. However, there may be differences in imitating peers, depending on how cohesive (individuals in) peer groups are.

In some groups, all adolescents interact regularly and are interconnected, resulting in more cohesive groups. In other peer groups, adolescents do not always interact regularly with each other, making the group more loose-knit. How well individuals in a peer group are interconnected could strengthen the transmission of norms, rules, and behavioral conformity, because cohesion facilitates and regulates information flow among peer group members (Horne, 2001). In a cohesive peer group, group members of the same individual also consider each other as peer group members, and can thus compare (and double-check) what behavior is considered desirable in the group. Because belonging to the peer group, gaining social approval, and avoiding social rejection is important for adolescents (e.g., Brown, 1990; Brown, 2004; Coleman, 1961), it becomes even more likely that they are influenced by other peer group members when behaviors regarded as desirable in that group are highly salient. Adolescents in cohesive peer groups will thus feel a stronger urge to conform to desirable behavior than adolescents in more loose-knit peer groups (Kreager, Rulison, & Moody, 2011).

Thus, adolescents are often confronted by new contexts and situations, wherein conforming to desirable behavior such as delinquency helps them find a place of belonging and acceptance. When desirable behavior becomes highly salient, conforming and imitating those behaviors is even more likely. Hence, the pressure to conform is likely to be higher in cohesive peer groups than in more loose-knit peer groups. Following this reasoning, we hypothesize that adolescents are more susceptible to peer influence in delinquency in more cohesive peer groups than in more loose-knit peer groups (Hypothesis 2).

## **The Present Study**

To our knowledge this study is the first to examine the effect of social status and cohesiveness in peer groups on peer influence processes in those groups. We attempt to make a first step in exploring features in groups that may enhance or inhibit the proliferation of delinquency among adolescent peer groups. Because peer groups might differ (greatly) in size and research has shown that clustering of behavior can also be influenced by the number of sources of social influence (Latané, 1981), we control for the number of peer group members (peer group size) in our analyses.

Furthermore, relative social status and structural cohesion are based on the perceptions of individuals in the peer group. That is, adolescent's relative social status is based on one's individual status (as a reputational measure) relative to the average status of others in their peer group, as perceived by the individual, whereas peer group cohesion refers to the extent to which the different peer group 'members', as identified by the adolescent, are interconnected among each other. Analyses will be conducted with stochastic actor-based modeling (RSiena; Snijders et al., 2010) using a large longitudinal sample of adolescent boys and girls. Examining peer group characteristics and relations within peer groups can help to gain insight into how proliferation of delinquency via peer influence is affected when considering this context and its relations.

## **Method**

### **Participants and Procedure**

Data stem from the SNARE (Social Network Analysis of Risk behavior in Early adolescence) project; a longitudinal project on the social development of early adolescents with a specific focus on adolescents' involvement in risk behavior. Two secondary schools were asked and willing to participate: One in the middle and the

other in the north of the Netherlands. Subsequently, all first- and second-year secondary school students from these schools were invited to enroll in SNARE (2011-2012). All eligible students and their parents received an information letter, asking for their participation. If students wished to refrain from participation, or if their parents disagreed with their children's participation, they were requested to send a reply card or email within ten days. One year later (2012-2013) all new first year students were again approached for participation in the study. In total, 1,826 students were approached for this study, of which 40 students (2.2%) declined to participate for various reasons, for example, the parent and/or adolescent had no interest, the adolescent was dyslectic, or it was too time consuming. A total of 1,786 students participated in SNARE (50.1% male, 83.9% Dutch).

Pre-assessment took place in September 2011, just as students entered the first or second year of secondary school. This was followed by three regular measurement waves in October, December, and April. For the present study we used data from the first three regular waves (October, December, and April) of both first- and second-year students. Of all 1,786 students who participated in the data collection, we focused on the first cohort (students enrolled in SNARE in 2011-2012), resulting in a subsample of 1,309 students (49% boys). The mean age of the sample was 13.19 (ranging from 11 to 15,  $SD = .71$ ). Of the respondents, 13.1% followed pre-vocational education with a practical-oriented pathway (VMBO-bg), 14.8% followed pre-vocational education with a theoretical-oriented pathway (VMBO-th), and 60.6% followed pre-university/senior general secondary education (HAVO/VWO). One of the two schools in SNARE runs at four 'locations', each with its own school management, that can be considered as independent schools. We thus had two schools at five school locations and therefore refer to 'school locations' instead of schools when we discuss our sample and data.

During the assessments a teacher and research assistants were present. The research assistant briefly introduced the questionnaire containing both self-reports as well as peer nominations, which the students filled in on the computer in class. Data were collected via the questionnaires using CS socio software ([www.sociometric-study.com](http://www.sociometric-study.com)) developed especially for this study and allowed students to fill in sociometric questions. The assessment of the questionnaires took place during regular lessons in approximately 45 minutes. Any students absent on the day were assessed within a month, if possible. The anonymity and privacy of the students were guaranteed. The study was approved by the Internal Review Board of one of the participating universities.



## Measures

*Peer group networks.* Peer group networks were derived from unlimited nominations in school locations, across classes and grades on the items ‘Who are your best friends?’ and ‘Who are part of the group you hang out with the most?’ Nominations for both questions were used to construct networks per school location, covering grades 1 and 2. Whereas peer networks are generally derived from peer nominations regarding (best) friends (see Veenstra et al., 2013), using the second item as well allowed us to construct networks that include all individuals who are part of an adolescent’s more intimate peer group. For this, friendship and “group” networks were merged into a single network. The nominations for both questions were summed per individual and a total score of 2 was recoded into 1, resulting in one big network covering both friendship and group-membership nominations. About 75% of the individuals an adolescent socializes with are also their best friends and 25% are not considered best friends, but are part of their peer group.

*Peer group size* was determined by the number of peers who an adolescent nominated in the peer group networks. This resulted in an average size of 8.67 ( $SD = .94$ ) adolescents. This number is in line with other studies (e.g., Bagwell, Coie, Terry, & Lochman, 2000; Gest, Farmer, Cairns, & Xie, 2003). Although other studies have found peer group sizes averaging five to six (e.g., Espelage, Holt, & Henkel, 2003; Farmer et al., 2002; Ryan, 2001), this may be attributed to differences in the context in which the questions were asked (class versus school) or the measures themselves (e.g., friendship versus group-membership questions).

*Relative social status.* First, *individual status* was assessed by individual proportion scores calculated from the number of in-class nominations received to the questions ‘Who is most popular?’ and ‘Who is least popular’. Proportional scores were then calculated by dividing the total number of nominations received by the number of nominating classmates for both measures, and subtracted from one another (most popular – least popular). This resulted in a reputational measure of social status for each individual (see Cillessen & Rose, 2005).

Next, we calculated the *peer group’s average status* among adolescents in those “peer groups”. For this, the peer group is based on peer group networks, in which group ‘members’ are identified by the adolescent (i.e., a nomination). The peer group is thus based on an individual adolescent’s perspective. Adolescents’ *relative social status* was based on an individual’s status minus the average status of all individuals in the peer group, resulting in negative scores (indicating that one’s

status is lower than the average status of the peer group), zero scores (one's status is similar to the average status of the peer group), and positive scores (one's status is higher than the average status of the peer group).

*Structural cohesion.* We used peer group network nominations to identify relevant relations between individuals in a peer group. Cohesion was then calculated as the clustering coefficient (local density) of each adolescent's peer group (excluding the respondent him/herself), indicating the degree to which all other individuals to whom an adolescent is related nominated each other as peer group members, ranging from 0 (loose-knit) to 1 (cohesive peer groups) (Borgatti et al., 2013, p. 156). The average level of structural cohesion ranged from .50 to .52 (*SD* range from .03 to .06) across all school locations.

*Delinquency (T1/T2/T3).* Self-reports were used to assess delinquency (17 items) (Nijhof, Scholte, Overbeek, & Engels, 2010; Van der Laan, Veenstra, Bogaerts, Verhulst, & Ormel, 2010). We asked students how often they had been involved in different types of delinquency in the last month, covering a wide range of behaviors such as theft, vandalism, aggression, weapon use and weapon carrying, truancy, contact with police, and fare dodging (see Appendix 3.1). The internal consistency of this measure of delinquency ranged from  $\alpha = .82$  to .92. Answer categories were measured on a five-point scale; never (0), 1-3 times (1), 4-6 times (2), 7-12 times (3), and more than 12 times (4). Answers were subsequently dummy-coded into no (0) or yes (1) and summed, resulting in variety scores for delinquency. This indicates the extent to which adolescents had been involved in various delinquent acts in the last month. Subsequently, these scores were categorized into no acts (0), one act (1), two acts (2), and more than two acts (3), because RSiena does not allow for the use of continuous dependent variables at this moment (Ripley et al., 2014). The average level of delinquency ranged from .48 to .58 across all school locations (*SD* range from .92 to 1.02).

### Analytical Strategy

Longitudinal social network modeling (SIENA in R, version 1.1.286; Steglich, Snijders, & Pearson, 2010) was used to examine the proliferation of delinquency in adolescent peer group networks. SIENA models the co-evolution of social networks and behavior over time, while controlling for structural network effects (Ripley et al., 2014). In so doing, SIENA can untangle influence processes (behavioral dynamics) from selection processes (network dynamics) regarding delinquency.

In our models, we added commonly used structural network effects and other network effects to best capture the peer group structure and come to a good

fit of the model (Ripley et al., 2014; Veenstra et al., 2013). Specifically, we included the following effects to control for structural network effects and improve model fit: *outdegree/density* (tendency to create relations), *reciprocity* (tendency to reciprocate a peer group network nomination), *transitive triplets* (tendency that when a respondent nominates two others in the peer group network, number one in the network also nominates number two; in case of friendships often referred to as the tendency that “friends of a friend are my friends”), *transitive reciprocated triplets* (tendency for triads to reciprocate peer group network nominations), *three cycles* (tendency for a (non-) hierarchical structure), *indegree popularity* (tendency for those who receive many peer group network nominations to receive extra nominations), *indegree activity* (activity of popular individuals; nominating others in the peer group network when being nominated often oneself), *outdegree activity* (activity of active individuals; nominating more others in the peer group network when already nominating often oneself), and *truncated outdegree* (sinks; individuals who nominate no one).

We also controlled for selection effects by examining whether boys nominate (*gender ego*) and were nominated (*gender alter*) more often than girls, and whether students of the same gender were more likely to select each other in the peer group network (gender homophily; measured with the *same-gender* effect). Similarly, we examined whether students in the same class (class homophily; measured with the *same-class* effect) or same grade (grade homophily; measured with the *same-grade* effect) selected each other more often than students in different classes or grades. Furthermore, we controlled for whether more delinquent students nominate (*delinquency ego*) and were nominated (*delinquency alter*) more often than less delinquent students, and whether students tended to select each other when they had similar levels of delinquent behavior (delinquency homophily; measured with the *ego x alter selection* effect).

We tested our main hypotheses separately for relative social status and structural cohesion in two steps. First, we included several behavioral dynamic effects that model changes in delinquency (Models 1). The *linear shape* effect modeled the overall tendency toward delinquency, whereas the *quadratic shape* parameter modeled the feedback effect of delinquency on itself, resulting in either regression to the mean (negative parameter) or polarization (positive parameter). In the behavioral part of the models we also controlled for the tendency that boys are more likely than girls to score highly on delinquent behavior (*effect from gender*), that students in higher grades are more likely to score highly on delinquent

behavior than students in lower grades (*effect from grade*), and that students in larger peer groups are more likely to score highly on delinquent behavior than students in smaller peer groups (*effect from peer group size*). Delinquency influence (*average alter*) examined whether there was a tendency for adolescents for whom peer group network relations had a higher score on delinquency also tended to develop higher levels of delinquency themselves over time (or vice versa).

Next, we included the main effects of relative social status, structural cohesion and their interaction with delinquency influence, respectively, to test our hypotheses (Models 2). The main effect of relative social status modeled the tendency that students with higher relative social status were more likely to score highly on delinquent behavior than students with a lower relative social status or vice versa (*effect from relative social status*). For models with relative social status we also controlled for the tendency that students with a higher individual status are more likely to score highly on delinquent behavior than students with a lower individual status (*effect from individual status*), and that students who 'reside' in a peer group with higher status are more likely to score highly on delinquent behavior than students who reside in a peer group with lower status (*effect from peer group status*). The main effect of structural cohesion modeled the tendency that students who resided in a more cohesive peer group were more likely to score highly on delinquent behavior than students who resided in a more loose-knit peer group or vice versa (*effect from structural cohesion*). The interaction between the main effect of relative social status and influence in delinquency examined the hypothesis whether peer influence in delinquency was especially strong for adolescents with a relatively lower social status in the peer group compared to adolescents with a relatively higher social status in the peer group. The interaction between the main effect of structural cohesion and influence in delinquency examined the hypothesis whether peer influence in delinquency was more likely in more cohesive peer groups than in more loose-knit peer groups. We combined the results of the separate analyses per school location in a meta-analysis using the *siena08* function in *RSiena* (Ripley et al., 2014; Snijders & Baerveldt, 2003).

Examining the goodness of fit (GoF) of our models allowed us to test if the observed scores at the end of a period were congruent with the simulated values for the end of that period (Lospinoso, 2012; Ripley et al., 2014). This way, we could see whether structures in the network and the behavior are properly captured with the fitted models. We assessed the indegree distribution, outdegree distribution, geodesic distribution, and triad census for the peer group networks. For

delinquency, we assessed Moran's I and the behavior distributions. When the GoF of models with a given set of parameters was poorly estimated, we included additional parameters to obtain a better fit. We also removed parameters that did not significantly add to the model to see how that affected the GoF. Going back and forth, including and excluding parameters, we tried to end up with a parsimonious model that showed the best possible fit (GoF statistics per school location and fit plots available upon request). The results of the overall GoF estimation across all five school locations showed a good fit of the models for the indegree, outdegree, and geodesic distributions ( $p = .35, .26, \text{ and } .28$  respectively). Triadic structures were more difficult to fit properly ( $p < 0.01$ ), but the current models offer the best possible fit for the data. Furthermore, the Moran's I distributions and the behavioral distributions for delinquency both showed a very good fit ( $p = .36, \text{ and } .55$  respectively).

## Results

### Descriptive Statistics

Table 3.1 provides descriptive information about the sample, status and cohesion measures, network characteristics, and delinquency. For ease of reading, we refer to peer group members when we discuss the results regarding peer group network relations. About half the sample consisted of boys, and 52 percent of the respondents were in the second grade of secondary education. As for the peer group network, about 4% of all respondents at their school location were nominated as peer group members across the three waves, and between 51% and 63% of relations with peer group members were reciprocated. The degree to which peer group members showed similar delinquent behaviors was relatively low, but positive (*Moran's I* = .08, .10, and .08, *SD* = .05 respectively). The Jaccard index indicated that about half the relations between peer group members were stable. Delinquency among adolescents was also quite stable (70%) for both periods, and there was a positive correlation for delinquency between the time points ( $r_{\text{Fall-Winter}} = .53, p < .05, r_{\text{Winter-Spring}} = .61, p < .05, \text{ and } r_{\text{Fall-Spring}} = .49, p < .05$ ).

Furthermore, correlations were found for the same waves between peer group size and relative social status (Table 3.2). Peer group size was positively related to relative social status ( $r = .10 \text{ to } .12, p < .01$ ), indicating that adolescents in larger peer groups had relatively higher social status than adolescents in smaller peer groups. Peer group size and relative social status correlated negatively with structural cohesion, suggesting that group-membership relations among

**Table 3.1.** Descriptive Statistics of the Sample, Network Characteristics, and Delinquency

	Time 1 (Fall)	Time 2 (Winter)	Time 3 (Spring)
	Est. (SD)	Est. (SD)	Est. (SD)
<i>Sample</i>			
Boys (proportion)	.49 (.05)	.49 (.05)	.49 (.05)
Age	13.22 (0.71)	13.45 (0.76)	13.78 (0.76)
Grade 2 (proportion)	.52 (.04)	.52 (.04)	.52 (.04)
Peer group status	.07 (.02)	.09 (.01)	.09 (.02)
Relative social status	-.06 (.01)	-.06 (.01)	-.06 (.01)
Structural cohesion	.50 (.05)	.50 (.03)	.52 (.06)
<i>Peer group network</i>			
Peer group size (nominations given) (Mean, SD)	8.79 (1.00)	9.13 (1.13)	8.62 (0.90)
Nominations received (Mean, SD)	8.67 (0.94)	8.83 (1.18)	8.32 (0.95)
Density (proportion)	.04 (.02)	.04 (.01)	.04 (.01)
Reciprocity (proportion)	.56 (.06)	.51 (.07)	.63 (.08)
Missing (proportion)	.01 (.01)	.03 (.02)	.04 (.02)
<i>Delinquency (proportion)</i>			
0	.71 (.09)	.70 (.05)	.69 (.04)
1	.14 (.04)	.13 (.02)	.13 (.02)
2	.06 (.04)	.07 (.01)	.05 (.02)
3	.09 (.03)	.11 (.04)	.13 (.03)
Missing	.04 (.03)	.06 (.03)	.08 (.04)
Network autocorrelation			
Moran's <i>I</i>	.08 (.05)	.10 (.05)	.08 (.05)
<i>Transitions/Change</i>			
	Fall – Winter	Winter - Spring	
Peer group relations			
Distance	1483 (945)	1494 (977)	
Jaccard	.52 (.03)	.50 (.04)	
Delinquency			
Decrease (proportion)	.13 (.05)	.14 (.04)	
Increase (proportion)	.17 (.04)	.16 (.03)	
Stable (proportion)	.70 (.06)	.70 (.05)	

**Table 3.2.** Correlations Between Peer Group Size, Relative Social Status, Structural Cohesion, and Delinquency

	2	3	4	5	6	7	8	9	10	11	12
1. Peer Group Size T1	.55**	.45**	.12**	.07*	.09**	-.08**	-.10**	-.16**	.03	-.00	-.00
2. Peer Group Size T2		.49**	.14**	.10**	.08**	-.06*	-.11**	-.13**	-.03	.05	.02
3. Peer Group Size T3			.10**	.10**	.12**	-.08**	-.09**	-.10**	-.01	-.00	.04
4. Relative Social Status T1				.73**	.62**	-.16**	-.17**	-.14**	.09**	.09**	.05
5. Relative Social Status T2					.73**	-.18**	-.16**	-.13**	.03	.09**	.07*
6. Relative Social Status T3						-.17**	-.20**	-.16**	.04	.08**	.06*
7. Structural Cohesion T1							.50**	.43**	-.11**	-.11**	-.10**
8. Structural Cohesion T2								.51**	-.10**	-.09**	-.12**
9. Structural Cohesion T3									-.04	-.09**	-.06*
10. Delinquency T1										.54**	.52**
11. Delinquency T2											.61**
12. Delinquency T3											

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

adolescents in larger peer groups were less cohesive than relations among adolescents in smaller peer groups ( $r = -.08$  to  $-.11$ ,  $p < .01$ ) and that adolescents with relatively high social status resided in more loose-knit peer groups than in cohesive peer groups ( $r = -.16$ ,  $p < .01$ ). All these correlations were statistically significant, but not very strong.

With regard to delinquency, peer group size did not relate to delinquency. There was a positive relationship between an adolescent's relative social status and delinquency ( $r = .06$  to  $.09$ ,  $p < .05$ ). Adolescents with relatively high social status compared to others in the peer groups were more delinquent than those with relatively low social status. Lastly, structural cohesion was related to less delinquency ( $r = -.06$  to  $-.11$ ,  $p < .05$ ). Adolescents in cohesive peer groups were less delinquent than adolescents in loose-knit peer groups.

### Peer Group Network Dynamics

Table 3.3 summarizes the meta-analysis of the five school locations for the effect of relative social status and structural cohesion on influence in delinquency. Peer group network effects showed a low density in the network (*outdegree*;  $b = -1.94$ ,  $p < .001$ ), which implies that respondents were selective as to whom they nominated as members of their peer group (Models 1). Respondents also tended to reciprocate peer group-membership nominations (*reciprocity*;  $b = 2.23$  and  $2.25$ ,  $p < .001$ ), nominated peer group members of peer group members as their own peer group members (*transitive triplets*;  $b = .41$ ,  $p < .001$ ), but tended not to reciprocate group-membership nominations in triads (*transitive reciprocated triplets*;  $b = -.28$  and  $-.29$ ,  $p < .001$ ). In line with this, there also was a tendency for a hierarchical ordering in the network (*three cycles*;  $b = -.09$  and  $-.08$ ,  $p < .001$ ), of those who were often nominated as a peer group member to also nominate many others as peer group members (*indegree activity*;  $b = -.80$  and  $-.83$ ,  $p < .001$ ), and of not nominating anyone as a peer group member (*truncated outdegree*;  $b = -2.27$  and  $-2.18$ ,  $p < .001$ ). Furthermore, the gender-homophily effect indicated that there was a tendency for same-gender peers to select each other as peer group members ( $b = .69$ ,  $p < .001$ ). Similarly, respondents in the same grade (*grade homophily*) or same class (*class homophily*) were more likely to select each other as peer group members than respondents who were not in the same grade or class ( $b = .40$ ,  $p < .001$ , and  $b = .74$ ,  $p < .001$  respectively). Respondents in higher grades were more likely to be nominated as peer group members than respondents in lower grades (*grade alter*;  $b = .20$ ,  $p < .001$ ), and respondents in lower grades tended to nominate more peer group members than respondents in higher grades (*grade ego*;



**Table 3.3.** RSiena Meta-Analysis of Network and Behavioral Dynamics for Delinquency and the Moderating Effect of Relative Social Status and Structural Cohesion on Delinquency Influence

	Relative Social Status		Structural Cohesion	
	Model 1 <i>b</i> ( <i>SE</i> )	Model 2 <i>b</i> ( <i>SE</i> )	Model 1 <i>b</i> ( <i>SE</i> )	Model 2 <i>b</i> ( <i>SE</i> )
<i>Peer group network dynamics</i>				
Density	-1.94*** (.44)	-1.99*** (.46)	-1.94*** (.46)	-2.00*** (.45)
Reciprocity	2.23*** (.08)	2.27*** (.09)	2.25*** (.10)	2.25*** (.09)
Transitive triplets	.41*** (.02)	.41*** (.02)	.41*** (.02)	.41*** (.02)
Transitive reciprocated triplets	-.28*** (.02)	-.29*** (.02)	-.29*** (.02)	-.28*** (.02)
Three cycles	-.09*** (.02)	-.09*** (.01)	-.08*** (.01)	-.09*** (.01)
Indegree popularity (sqrt)	.02 (.06)	.04 (.05)	.03 (.05)	.03 (.05)
Indegree activity (sqrt)	-.80*** (.14)	-.82*** (.12)	-.83*** (.12)	-.80*** (.11)
Outdegree activity (sqrt)	.05 (.04)	.07 <sup>+</sup> (.04)	.06 (.04)	.06 <sup>+</sup> (.04)
Truncated outdegree	-2.27*** (.42)	-2.23*** (.42)	-2.18*** (.42)	-2.23*** (.42)
Gender alter (receiver effect)	.07 (.05)	.07 (.05)	.07 (.05)	.07 (.05)
Gender ego (sender effect)	-.10 (.07)	-.10 (.07)	-.10 (.07)	-.09 (.07)
Gender homophily	.69*** (.11)	.69*** (.11)	.69*** (.11)	.69*** (.11)
Grade alter (receiver effect)	.20*** (.04)	.20*** (.04)	.20*** (.04)	.20*** (.04)
Grade ego (sender effect)	-.15* (.06)	-.15* (.06)	-.14* (.06)	-.14* (.06)
Grade homophily	.40*** (.10)	.40 (.10)	.40*** (.10)	.41*** (.10)
Class homophily	.74*** (.19)	.75 (.19)	.74*** (.19)	.74*** (.19)
Delinquency alter (receiver effect)	-.02 (.02)	-.02 (.02)	-.02 (.02)	-.02 (.02)
Delinquency ego (sender effect)	.02 (.02)	.02 (.02)	.02 (.02)	.02 (.01)
Delinquency homophily	.06*** (.02)	.06** (.02)	.06*** (.02)	.06** (.02)
<i>Delinquency dynamics</i>				
Linear shape	-1.62*** (.13)	-1.63*** (.12)	-1.62*** (.13)	-1.63*** (.13)
Quadratic shape	.66*** (.03)	.65*** (.03)	.67*** (.03)	.65*** (.03)
Effect from gender (boy = 1)	.21*** (.07)	.21** (.08)	.19** (.06)	.21** (.06)
Effect from grade	.12* (.06)	.10+ (.06)	.12* (.06)	.09 (.06)
Effect from peer group size	.004 (.010)	.004 (.010)	.004 (.004)	.004 (.010)
Delinquency influence	.35* (.14)	.35* (.15)	.43** (.13)	.43** (.14)
Effect from individual status	.13 (.12)	.20 (.61)		
Effect from peer group status	.45* (.21)	.39 (.64)		
Effect from relative social status		-.13 (.64)		
Delinquency influence x relative social status		.84 (.62)		
Effect from structural cohesion				-.46 (.46)
Delinquency influence x structural cohesion				.06 (.59)

Note. <sup>+</sup>  $p < .1$ . ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

$b = -.15, p < .05$ ). Lastly, respondents who showed higher levels of delinquency were not nominated more often as peer group members and did not nominate more peer group members, but it was more likely for respondents with similar levels of delinquency to be peer group members, than respondents with different levels of delinquency (*delinquency homophily*;  $b = .06, p < .001$ ).

### Delinquency Dynamics

With regard to the behavioral dynamics, we found that adolescents had a low tendency toward delinquency (*linear shape*;  $b = -1.62, p < .001$ ), but those with a higher score on delinquency were more likely to have higher scores for delinquency over time, and vice versa (*polarization*; *quadratic shape*;  $b = .66$  and  $.67, p < .001$ ). Furthermore, boys tended to score higher on delinquency than girls (*effect from gender*;  $b = .21$  and  $.19, p < .001$ ). The same holds for grade; respondents in higher grades had a stronger tendency to score highly on delinquency than respondents in lower grades (*effect from grade*;  $b = .12, p < .05$ ). Peer influence in delinquency was positively present in all models ( $b = .35, p < .05$  and  $b = .43, p < .01$ ). Model 1 for relative social status also shows that individuals in peer groups with higher group status scored higher on delinquency than individuals in peer groups with lower group status (*effect from peer group status*;  $b = .45, p < .05$ ). However, no moderating effect of either relative social status (Hypothesis 1) or structural cohesion (Hypothesis 2) on delinquency influence was found (Models 2). Although adolescent's delinquency was influenced by peer group members' delinquency, susceptibility to peer influence was not more likely for adolescents with a relatively low social status compared to adolescents with a relatively high status, or when the peer group was more cohesive.

### Discussion

Although it is known that peers become an increasingly important factor of influence during adolescence, the conditions that enhance or inhibit peer influence in delinquency are relatively unexplored. Structural features of (individuals in) peer groups might steer group dynamics into a situation where peer influence in delinquency becomes more or less likely. In this study we examined such features as the extent to which an adolescent's relative social status compared to peer group members and cohesion among peer group members. More specifically, we examined whether susceptibility to adolescent influence in delinquency depended on relative social status and structural cohesion among peer group members.

We expected that adolescents with relatively low social status would be more susceptible to peer influence than adolescents with relatively high social status, because popular peer group members are likely to evoke social mimicry among those lower in status. Lower status group members may want to bask in the reflected glory of high status peer group members. Furthermore, we expected peer influence to be stronger for adolescents who resided in a structurally cohesive peer group rather than a loose-knit peer group, because cohesive peer groups offer more clarity on desirable behavior, and pressure to conform to that behavior is stronger.

Similar to other studies focusing on friendship (e.g., Burk et al., 2008; Haynie et al., 2014; Kerr et al., 2012; Svensson et al., 2012; Weerman, 2011), we consistently found a positive influence effect of delinquency among adolescents in the peer group networks. This indicates that peer influence in delinquency transcends friendships, whereby also individuals who are part of the group an adolescent hangs out with most often are influential factors for adolescents' delinquency. However, we found no moderating effect of the examined structural features of (individuals in) peer groups, that is, relative social status and structural cohesion, on peer influence in delinquency. In this study it does not look like adolescents with low relative social status are more susceptible to peer influence than adolescents with relatively high social status, or that adolescents in a structurally cohesive peer group are more susceptible than adolescents in a loose-knit peer group.

Researchers do raise the question whether peer influence could be moderated by individual or contextual characteristics (see Veenstra et al., 2013), but studies examining moderation are relatively scarce, although modeling moderation with regard to peer influence can be investigated quite well. The fact that only a few studies find moderation on peer influence might lead to the conclusion that peer influence in adolescence is more generally applicable across different contexts and situations than thought to be. If so, then studies examining the fundamentals of selection and influence in adolescence already offer quite a complete image of what happens, and moderation might be hard to find simply because it is not so common.

However, there could also be other reasons why we found no moderating effect of relative social status on the susceptibility to influence in delinquency. For one, our measure of delinquent behaviors differentiates little with regard to engagement in delinquency in our sample and it might be interesting to examine a

less extreme scale of deviant behavior in this sample of early adolescents. Secondly, not finding a moderating effect may be related to how motivated adolescents are to attain high social status. Some adolescents might be more motivated than others, depending on their goals. Individuals committed to attaining high social status will be more likely to move to what is helpful to achieve their goal (Caravita & Cillessen, 2012; LaFontana & Cillessen, 2010), and thus will be more likely to imitate the behavior of successful, high status others in the peer group, as argued before. However, those who do not aim (so strongly) at status will be less inclined to conform to the behavior of high status others. For example, Hurrelmann and Engel (1992) showed that adolescents' delinquency was related to goals for prestige and success. Other studies on antisocial behavior showed similar results, where behavior was particularly related to one's goals for prestige in terms of popularity or status (Sijtsema, Veenstra, Lindenberg, & Salmivalli, 2009). Thus, to fully grasp when social status or popularity relates to susceptibility to peer influence, studies should also consider possible differences in status motivation or goals that adolescents might have.

Other studies also suggest that not all individuals are likely to be influenced in behaviors associated with high status peers, but by more general normative group behavior that is not necessarily related to high status or popularity (Dishion et al., 2001; Killeya-Jones, 2007). Perhaps in some peer groups, high status adolescents are role models only for some, such as individuals who desire high status themselves. This may relate to why a moderating effect of structural cohesion was missing. Some individuals in peer groups might be inclined to follow a different behavioral norm than others, because of differences in individual norm salience in different peer groups. Research has, for example, shown that the impact of behavioral norms depends on whether that norm is important for an individual (Cialdini et al., 1991). When behavior is unimportant or irrelevant to an individual, it is unlikely that they will conform to that behavior. Although adolescents in cohesive peer groups would be more likely to agree upon behavioral norms, that does not mean that the same behavior is salient for each individual in the group. Another explanation for not finding a moderating effect of structural cohesion is that adolescents in our sample were embedded in the peer group network in a similar way, resulting in a very low variance in cohesion. Testing our hypothesis in a sample with more variations or extremes regarding cohesiveness between adolescents in the peer group network would be more informative when examining the effect of structural cohesion on adolescents' delinquency.

This study and its analyses regards peer influence as ‘modeling observed behavior’, which might be seen as following descriptive norms. Where descriptive norms clearly demonstrate how others act in specific situations (Bandura & McClelland, 1977; Cialdini et al., 1991; Keizer et al., 2008), it is also likely that individuals will conform to a norm when it is supported by a general indication of what others approve or disapprove (i.e., injunctive norms) (Cialdini et al., 1991; Reno, Cialdini, & Kallgren, 1993). Especially focal injunctive norms have shown to induce norm-conforming behaviors because they are relevant to a wide range of settings. Thus, accounting for individual differences in norm salience might give a better understanding of the underlying mechanisms that differentiate between susceptibility to peer influence in adolescent peer groups.

Furthermore, in our analyses, relative social status and structural cohesion are endogenous to the peer group network, thus officially violating the model assumptions (exogenous variables). However, this makes the tests reported in our study statistically conservative. If peer groups change a lot, we may have captured the wrong peer group members for assessing influence, in which case the estimated moderators likely underestimate the true effects. If the groups are very stable, our estimates are accurate. Given that we found no moderating effects, we are certain that our findings deal with true effects and we are confident that we stay on the safe side in drawing our conclusions.

### **Limitations and Suggestions for Future Research**

We consider the perception an adolescent has of who belongs to their peer group to contain most individuals who can influence their delinquent behavior, but possibly someone not identified as a peer group member can influence the adolescent through this person’s effect on the group’s social norm. Measures that specifically identify peer groups are often based on finding unique (non-overlapping) groups of individuals and analyses with those measures also take into account individuals that an adolescent might not have nominated as a group member him- or herself (Cairns, Perrin, & Cairns, 1985; Kreager et al., 2011; Moody, 2001; Richards & Rice, 1981). However, the external validity of other measures, such as NEGOPY, RNM, Social Cognitive Maps, or Moody’s CROWDs routine has not been consequently assessed. It is thus difficult to determine which individuals actually do have an influence on adolescent behavior. It would be insightful to study if the configuration of peer groups as determined by various statistical methods matches reality.

Furthermore, we do not assess the underlying mechanisms that affect how relative social status and structural cohesion relate to influence in delinquency. As mentioned before, the motivation or goal directedness of adolescents might have an effect on how inclined they are to conform to certain behavior. Similarly, it is not clear which social norms are salient for an individual in a peer group. Therefore, future studies should also focus on testing goals and norms, to enable determining how social status and cohesion actually relate to the proliferation of delinquency in peer groups.

### **Conclusion**

Our study is the first to consider structural features of (individuals in) peer groups as moderating factors of peer influence in a longitudinal framework. Our findings are in line with many other studies; there is clear evidence for peer influence in delinquency. However, our results do not show that peer influence in delinquency was moderated by relative social status or structural cohesion. This may be due to other underlying mechanisms, such as differences in individual goals or norm conformity, but it is also possible that peer influence in delinquency occurs in a wide range of settings. Our findings thus strengthen the pervasive nature of peer influence processes.

### Appendix 3.1. Delinquency items

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#### Question (In the last month)

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How often have you stolen a bike or moped?

How often have you stolen something from a store (shoplifting)?

How often have you stolen something else (not a bike or something from a store) worth less than 25 euros?

How often have you stolen something else (not a bike or something from a store) worth more than 25 euros?

How often have you bought or sold anything that you suspected was stolen?

How often have you purposely damaged or wrecked something on the streets, such as walls, subway, train, bus shelters, traffic signs, garbage cans?

How often have you purposely damaged or wrecked property belonging to people that you know (at home, from another pupil)?

How often have you purposely damaged or wrecked property that belongs to a school (building, furniture, books, plants)?

How often have you trespassed or broken into a building (we do not mean unoccupied or deserted buildings)?

How often have you purposely set fire to, for example a shed, forest, roadside, basement, or building?

How often have you seriously fought or quarreled with people you do not know (e.g., on a sports field, train station, festival, or in the streets)?

How often have you hit or injured another person by hand, which led to that person having to go to the doctor or get treated for their injury?

How often have you carried a weapon (e.g., a dangerous knife, bat, firearm, brass knuckles)?

How often have you used or threatened someone with a weapon during a fight or quarrel?

How often have you played truant (skipping school)?

How often have you come into contact with the police for doing something you weren't allowed to do?

How often have you traveled on a bus or train without paying (fare dodging)?

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