

University of Groningen

Bullying in schools

Oldenburg, Beau

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2017

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Oldenburg, B. (2017). *Bullying in schools: The role of teachers and classmates*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Chapter 5

Helping victims of bullying: The co-occurrence of defending, friendship, and dislike relationships

Abstract

This study investigated defending behavior in elementary schools using social network analysis. It was investigated to what extent defending relationships co-occurred with two common types of positive and negative relationships among elementary school students: friendship and dislike. Bivariate Exponential Random Graph Models (ERGMs) were used to analyze the defending-friendship and defending-dislike networks in seven grade-three classrooms. As expected, the results indicated that victimized students were likely to give defending nominations to students who they also nominated as a friend or who nominated them as friend. Moreover, defending was likely to occur when the victim and (potential) defender were both nominated as a friend by the same classmates. Victimized students were unlikely to give defender nominations to classmates whom they disliked or who had indicated to dislike them. Finally, defending was likely to occur between students who disliked the same classmates.

5.1 Introduction

One important reason for why students bully is that they aspire to social status in the peer group (Olthof et al., 2011; Olweus, 1993). By harassing others, bullies aim to demonstrate their power to the rest of the group (Veenstra, Lindenberg, Munniksma, & Dijkstra, 2010). Accordingly, bullying nearly always occurs in the presence of witnessing peers (Atlas & Pepler, 1998; Craig, Pepler, & Atlas, 2000).

Students who witness that their classmates are being bullied can react to this in three ways. They can: 1) support the bullying (e.g., join in or cheer), 2) ignore the bullying (e.g., walk away from it or pretend not to see it), or 3) defend the victim (e.g., help or comfort the victim). By supporting or ignoring the bullying, witnessing students inadvertently signal to the bully and victim that the bullying is 'cool' or that it at least is acceptable behavior. Conversely, by defending victimized classmates, students signal that they do not accept or like this kind of behavior. When most students disapprove the bullying and defend the victim, bullying is not an effective strategy to climb the social ladder. Indeed, one study demonstrated that defending was negatively associated with the frequency of bullying in the classroom (Salmivalli, Voeten, & Poskiparta, 2011). In addition, defending victimized classmates potentially mitigates the negative effects of bullying: one (cross-sectional) study demonstrated that defended victims had a better psychosocial adjustment than undefended victims (Sainio, Veenstra, Huitsing, & Salmivalli, 2011).

Defending is thus important: it may alter the bully's behavior and can provide a buffer against the negative consequences of bullying. In the past decade, several studies sought to better understand defending behavior. Although these studies provided valuable insight into defending, nearly all of them focused on individual characteristics of defenders (e.g., Nickerson, Mele, & Princiotta, 2008; Pozzoli et al., 2012), hereby ignoring that defending actually is a relational phenomenon. That is, defending is a directed dyadic relationship in which by definition at least two actors (i.e., a victim and a defender) are involved. This implies that rather than *being* a defender (i.e., always behaving in this way), students' behavior can be *flexible*; they may defend certain classmates but remain passive when other classmates are victimized (Huitsing & Veenstra, 2012).

We argue that in order to properly take this relational nature of defending into account, defending behavior should be investigated using social network analysis. In social network analysis the focus is not on individual-level outcomes but on the presence or absence of relationships between individuals within a certain social group. Recently, social network analysis has been used to investigate different types of positive and negative relationships among primary school and high school students (e.g., helping, liking, and bullying relationships) (Huitsing et al., 2012; Huitsing, Snijders, Van Duijn, & Veenstra, 2014; Van Rijsewijk, Dijkstra, Pattiselanno, Steglich, & Veenstra, 2016).

As far as we are aware of, only two studies have used social network analysis to investigate defending behavior. Sainio and colleagues (2011) investigated defending by analyzing dyadic relationships between victims and (potential) defenders (i.e., they investigated defending behavior between two students). Huitsing and colleagues (2014) carried these analyses a step further and investigated to what extent defending relationships

co-evolved with victimization and bullying relationships. They found that over time victims of the same bullies defended each other, that defenders ran the risk of becoming victimized by the bullies of the victims they defended, that bullies with the same victims defended each other, and that defenders of bullies joined the harassment of those bullies' victims.

Apart from these insights, not much is known about defending networks. The aim of the present study was to investigate defending networks in Dutch elementary schools. We were particularly interested in examining to what extent defending relationships co-occurred with two common types of positive and negative relationships among elementary school students: friendship and dislike. We elaborate on this in the following two sections.

5.1.1 Friendship

Dyadic friendship

Being friends with someone entails more than simply liking this person; friendship implies a certain degree of responsibility for each other's well-being. Consistent with this, several studies found a clear link between friendship and helping (Barry & Wentzel, 2006; Bowker et al., 2010; Bukowski, Hoza, & Boivin, 1994; Parker & Asher, 1993). It is likely that students feel responsible for defending their victimized friends and also expect to be defended by their friends when they are bullied.

A complication—and a possible explanation for why defending and friendship relationships may not fully overlap—is that friendships are not necessarily reciprocal. Although it is commonly assumed that when student *i* perceives student *j* as a friend, *j* will also perceive *i* as a friend, research suggests that this is not always the case (Vaquera & Kao, 2008).

In this study, three different friendship variations could be observed: 1) friendships in which the victim nominated the defender as a friend, but the defender did not reciprocate this nomination, 2) friendships in which the defender nominated the victim as a friend, but the victim did not reciprocate this nomination, and 3) reciprocated friendships. To account for this asymmetry, we did not only investigate to what extent defending relationships co-occurred with reciprocal friendship relationships, but also investigated to what extent it co-occurred with unreciprocated friendship relationships.

Friendship in groups

Friendship does not only occur in dyads, but also occurs in groups. According to Heider's (1958) balance theory, individuals tend to befriend friends of their friends. We argue that students are likely to defend victimized friends of their friends because even though they are not directly friends with these students (yet), they may have positive feelings towards them. In addition, by defending a victimized friend of their friend students may do this friend a favor.

5.1.2 Dislike

Dyadic dislike

By contrast, we argue that defending relationships are unlikely to co-occur with dislike relationships. Research demonstrated that students who defend victimized classmates run the risk of becoming targets of bullying as well (Huitsing et al., 2014; Meter & Card, 2015; Pozzoli, Gini, & Vieno 2012). We argue that students are unlikely to be willing to face this risk for victims whom they dislike. Accordingly, we expected that defending was unlikely to occur when the (potential) defender disliked the victim. Similarly to friendships, dislike relationships are not necessarily reciprocal. Accordingly, we investigated to what extent unreciprocated dislike relationships co-occurred with defending relationships.

Dislike in groups

In addition to dyadic dislike relationships, we investigated dislike relationships in groups. Heider's (1958) balance theory does not only imply that 'friends of my friends are my friends' but also that 'enemies of my enemies are my friends'. Being disliked by the same classmate or disliking the same classmate may create a bond. Therefore, we expected that defending relationships were likely to occur between students who were disliked by the same classmates or between students who disliked the same classmates.

5.1.3 The present study

In short, the present study aimed to contribute to prior studies on defending behavior by investigating defending networks in Dutch elementary schools. We investigated to what extent defending relationships co-occurred with two common types of positive and negative relationships among elementary school students: friendship and dislike. We hypothesized that defending was likely to occur between friends (hypothesis 1) and between friends of friends (hypothesis 2). In addition, we hypothesized that defending was unlikely to co-occur with dyadic dislike relationships (hypothesis 3). Finally, we hypothesized that defending relationships were likely to occur between students who were disliked by the same classmates (hypothesis 4) or between students who disliked the same classmates (hypothesis 5).

5.2 Method

5.2.1 Sample and procedure

The data were part of a larger ongoing project evaluating the effectiveness of the Dutch version of the KiVa anti-bullying program (see Huitsing et al., 2014; Oldenburg et al., 2015; Van Der Ploeg, Steglich, Salmivalli, & Veenstra, 2015). All data reported here were collected in May 2012, before the KiVa program was implemented. The data consisted of 462 elementary school classrooms. In order to be able to directly compare the parameter

estimates of the different classrooms, only (single grade) grade 3 classrooms with the median number of students (i.e., 23) were selected. The selected sample consisted of 7 classrooms.

Participating students filled out web-based questionnaires during regular school hours. Schools sent a letter with information about the study's aims and procedures to the students' parents before the data were collected. Parents who did not want their children to participate were requested to return a form to the school. The students read the questionnaire by themselves; difficult concepts were explained in instructional videos. In these videos a professional actress explained the questions in such a way that students would understand them (e.g., by using age-appropriate language, talking slowly, and articulating words clearly). Classroom teachers were present to answer questions and to assist students whenever necessary. Teachers were supplied with detailed instructions before the data collection had started and they were encouraged to help students in such a way that it would not affect their answers (e.g., by asking them questions such as "Which words are unclear to you?"). Students were reassured that their answers would remain confidential and they were advised not to talk about their answers to others.

5.2.2 Defending, friendship, and dislike networks

Defending networks

The defending networks were measured by asking victimized students which classmates defended them. Students who had experienced at least one form of bullying (e.g., physical, relational, or material bullying) in the past months were asked to nominate their defenders. Victimization was measured using the Olweus bully/victim questionnaire (Olweus, 1996). Victimized students read a description in which it was explained that some children help others who are bullied by supporting them, comforting them, or by telling the bullies to stop. After they read the description, the victimized students were asked to select the names of classmates who supported, comforted, or helped them when they were bullied. Victims could select an unlimited number of classmates as defenders. The defending variable had score 1 when victim i nominated classmate j as a defender (i.e., there was a defending relationship) and score 0 when victim i did not nominate classmate j as a defender (i.e., there was no defending relationship). By measuring defending in this way, defending a victimized classmate was represented by an incoming nomination. In other words, defenders were nominated by the victims whom they defended.

Friendship and dislike networks

Students were asked to select the names of classmates who were their best friends and of classmates whom they disliked. They could select an unlimited number of classmates for both questions. The friendship and dislike variables had score 1 when student i nominated classmate j (i.e., there was a friendship/dislike relationship) and score 0 when student i did not nominate classmate j (i.e., there was no friendship/dislike relationship).

Gender

Several studies demonstrated that during childhood and early adolescence social interaction predominantly takes place in same-gender peer groups (Baerveldt, Van De Bunt, & Vermande, 2014; Rubin, Bukowski, & Parker, 2006; Veenstra et al., 2013). Moreover, helping relationships are more likely to occur in girls' relationships than in boys' relationships (Batanova, Espelage, & Rao, 2014; Trach, Hymel, Waterhouse, & Neal, 2010; Van Rijsewijk et al., 2016). Accordingly, we added configurations reflecting gender similarity and gender sender and receiver effects to the models. Boys were coded as 1. The number of boys ranged from 9 to 13 boys per classroom.

5.2.3 Analyses

The hypotheses were tested using Exponential Random Graph Models (ERGMs, for a comprehensive overview see Robins et al., 2007a; Lusher, Koskinen, & Robins, 2013). ERGMs allow the researcher to investigate which patterns (e.g., reciprocity or transitivity) characterize relationships in an observed social network. Based on theoretical arguments, the researcher selects *network configurations* which are included in the model as 'explanatory variables'. Somewhat similar to logistic regression, a positive parameter indicates a higher occurrence of the configuration in the observed network than would be expected by chance. In ERGMs the interpretation of every model parameter is conditional on the other parameters in the model. This implies that dyadic configurations need to be taken into account when interpreting triadic or higher order configurations.

We used XPNNet (Wang, Robins, & Pattison, 2009) to analyze the defending-friendship networks and defending-dislike networks. XPNNet is the only software available for the estimation of multivariate ERGMs (for a comprehensive overview see e.g., Wang, 2013). The maximum number of networks that can be analyzed simultaneously in XPNNet is two.

In ERGMs univariate configurations are used as building blocks for the bivariate models. We used the configurations of Huitsing and colleagues (2012, friendship and dislike) and Huitsing and Veenstra (2012, defending) as starting points for selecting univariate defending, friendship, and dislike configurations (see the first two sections of Tables 5.3 and 5.4). Based on the XPNNet user manual (Wang et al., 2009) bivariate configurations that best matched the hypotheses were selected.

Table 5.1 provides an overview of the selected bivariate configurations. Similarly to the studies of Sainio and colleagues (2011) and Huitsing and colleagues (2014), in this study victimized students were asked who defended them. It is important to note that by measuring defending in this way, defending a victimized classmate was represented by an incoming nomination. The dashed grey circles in Table 5.1 represent victimized students. Dashed arrows represent defending relationships, solid arrows represent friendship or dislike relationships. The arrows point from the student giving the nomination towards the student receiving the nomination. The seven classrooms are indicated by Roman numerals.

For the defending-dislike networks it was not possible to include the reciprocityABB configuration in the model because, as expected, this configuration was (almost) never

observed in the selected classrooms (see Table 5.1). In our sample victimized students were unlikely to give defender nominations to classmates with whom they had a reciprocated dislike relationship.

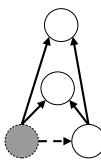
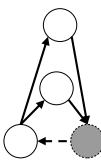
In order to take into account that only victimized students could nominate defenders, non-victimized students were treated as structural zeros in the defending networks. These students could receive defender nominations but could not give defender nominations. The number of students who were treated as structural zeros ranged from 4 to 12 per classroom.

XPNet uses Markov Chain Monte Carlo (MCMC) methods to obtain Maximum Likelihood estimates. The model estimation successfully converges when the values of all t-statistics of parameters that are included in the model are smaller than 0.10 (Wang, Robins, & Pattison, 2009). As suggested by Wang, Robins and Pattinson (2009), we increased the multiplication factor for models that did not converge using the default settings. The used settings are listed in the footnotes of the tables displaying the results of the analyses. Once all t-statistics had reached a value smaller than 0.10, XPNet calculated the goodness of fit statistics. The model fitted the data when (most) t-statistics of parameters that were not included in the model were lower than 2. Through careful parameterization an acceptable goodness of fit was obtained for all networks.

In order to be able to draw general conclusions, the results of the two analyses were combined in two meta-analyses, using R-package metafor (Viechtbauer, 2010). Due to the selection of classrooms with the same size, the parameter estimates can be considered as parallel measures and are therefore comparable on the same scale. Average parameter estimates with standard errors are obtained in the meta-analysis, facilitating an overall test of the hypotheses. Moreover, the meta-analyses indicated whether the estimates varied significantly over the seven classrooms.

Table 5.1 Configurations defending-friendship and defending-dislike

| Interpretation | Name (Name in XPNet) | Graphical representation | Class I | Class II | Class III | Class IV | Class V | Class VI | Class VII |
|---|--|-----------------------------|------------|-------------|--------------|-------------|------------|-------------|--------------|
| The grey victimized student nominates a classmate as a defender and as a friend | ArcAB | | 37 | 50 | 56 | 30 | 19 | 58 | 38 |
| The grey victimized student gives a defending nomination to a classmate who nominated him as a friend | ReciprocityAB | | 25 | 34 | 41 | 25 | 17 | 50 | 37 |
| The grey victimized student gives a defending nomination to a classmate with whom he has reciprocal friendship | Reciprocity ABB | | 21 | 33 | 33 | 23 | 17 | 43 | 27 |
| The grey victimized student gives a defending nomination to a friend of classmates who nominated him as a friend | Multiple two-paths of B with cyclic closure of A (CKT-BAB) | | 46.9 | 76.9 | 84.2 | 38.3 | 26.4 | 114.0 | 76.2 |
| The grey victimized student and the classmate he nominates as a defender are both nominated as friends by the same students | Closure of A for shared in-ties of B (DKT-BAB) | | 58.2 | 93.2 | 100.3 | 51.1 | 30.6 | 130.8 | 99.3 |
| The grey victimized student nominates a classmate as a defender and as someone he dislikes | ArcAB | | 1 | 3 | 1 | 0 | 0 | 2 | 1 |
| The grey victimized student gives a defending nomination to a classmate who dislikes him | Reciprocity AB | | 3 | 8 | 3 | 0 | 0 | 2 | 3 |
| The grey victimized student gives a defending nomination to a classmate with whom he has reciprocal dislike relationship | Reciprocity ABB | | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| The grey victimized student and the classmate he nominates as a defender are both disliked by the same students | Closure of A for shared in-ties of B (DKT-BAB) | | 22.8 | 51.9 | 79.4 | 42.9 | 16.8 | 107.9 | 34.3 |

| | | | |
|--|---|---|---------------------|
| <p>The grey victimized student and the classmate he nominates as a defender both dislike the same students</p> | <p>Closure of A for shared out-ties of B (UKT-BAB)</p>  | <p>22.0 73.5 91.5 31.1 14.3</p> | <p>46.5 29.0</p> |
| <p>The grey victimized student gives a defending nomination to a classmate who dislikes a student who dislikes him</p> | <p>Multiple two-paths of B with cyclic closure of A (CKT-BAB)</p>  | <p>19.0 54.9 81.9 29.2 13.8</p> | <p>62.9 27.6</p> |

Note: Dashed grey circles represent victimized students (i.e., students who could nominate defenders). Dashed arrows represent defending relationships (network A), solid arrows represent friendship or dislike relationships (network B). The arrows point from the student giving the nomination towards the student receiving the nomination.

5.3 Results

Table 5.2 displays the density (i.e., the relative number of relationships in the network) and the reciprocity of the defending, friendship, and dislike networks. Overall, the density and reciprocity were highest in the friendship networks, and lowest in the defending networks.

| | I | II | III | IV | V | VI | VII |
|------------------------|------|------|------|------|------|------|------|
| Density defending | 0.10 | 0.13 | 0.14 | 0.07 | 0.04 | 0.15 | 0.10 |
| Reciprocity defending | 0.13 | 0.14 | 0.16 | 0.17 | 0.10 | 0.17 | 0.19 |
| Density friendship | 0.21 | 0.25 | 0.26 | 0.22 | 0.25 | 0.34 | 0.38 |
| Reciprocity friendship | 0.23 | 0.30 | 0.27 | 0.29 | 0.33 | 0.32 | 0.23 |
| Density dislike | 0.11 | 0.22 | 0.25 | 0.25 | 0.16 | 0.17 | 0.19 |
| Reciprocity dislike | 0.16 | 0.21 | 0.31 | 0.31 | 0.18 | 0.17 | 0.20 |

5.3.1 Defending-friendship networks

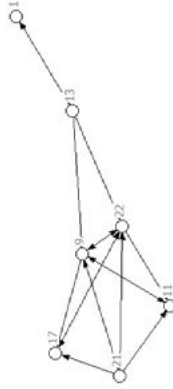
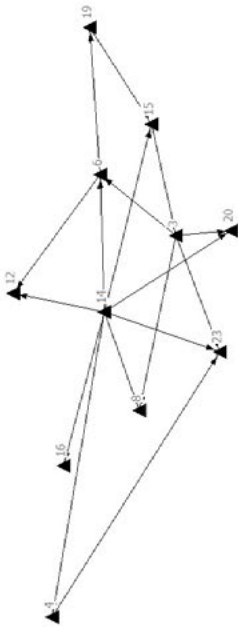
Table 5.3 displays the results of the analysis of the defending (network A) and friendship (network B) networks. The univariate statistics demonstrate that defending ($b=0.87$, $p<0.001$) and friendship ($b=1.12$, $p<0.001$) were likely to be reciprocated. Moreover, the defending networks were characterized by clustering rather than connectivity (multiple two-paths, $b=-0.11$, $p=0.03$; transitive closure, $b=0.48$, $p<0.001$). The friendship networks also exhibit various clusters (out-ties spread, $b=-1.56$, $p<0.001$; multiple two-paths, $b=-0.20$, $p<0.001$; transitive closure, $b=1.02$, $p<0.001$). Moreover, Table 5.3 demonstrates that defending and friendship often occurred in same-gender groups (gender interaction defending, $b=3.25$, $p=0.02$; gender interaction friendship, $b=1.08$, $p<0.001$).

The meta-analysis indicates that classrooms differed significantly from each other in the size of the gender similarity effect for defending. For instance, in classrooms I, II, and V no significant effects were found, whereas in classrooms III, IV, VI, and VII strong effects were found. In fact, as Figure 5.1 illustrates (black triangles represent boys, white circles represent girls), the defending network in classroom IV was completely segregated, which explains the high parameter estimates in this classroom.

○²
 ▲⁵
 ○⁷
 ○¹⁰
 ○¹⁸

Figure 5.1 Defending network classroom IV

▲ = Boys
 ○ = Girls

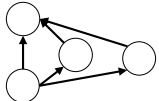
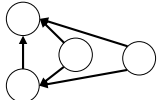

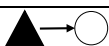
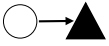
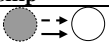
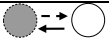
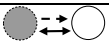
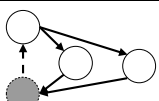
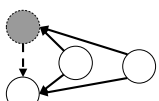


We hypothesized that defending was more likely to occur between friends and investigated three dyadic friendship variations. We found that victimized students were indeed likely to give defending nominations to students who they also nominated as their friend (arcAB, $b=1.70$, $p<0.001$). In addition, we found that victimized students were likely to give defending nominations to students who nominated them as a friend (reciprocityAB, $b=0.88$, $p=0.002$). The reciprocity ABB configuration can be interpreted as a combination of the arc AB and reciprocity AB configurations. Table 5.3 shows a small non-significant negative estimate, indicating that there is no additional effect of this specific configuration.

In addition, we hypothesized that defending was likely to occur between friends of friends. Taking into account the other effects in the model, we found that defending was more likely to occur when the victim and potential defender were both nominated as a friend by other classmates (closure of A for shared in-ties of B, $b=0.34$, $p<0.001$). Victimized students were unlikely to give defending nominations to friends of classmates who nominated them as friends (multiple two-paths of B with cyclic closure of A, $b=-0.37$, $p<0.001$), indicating that there is not a tendency toward generalized exchange (Bearman, 1997) but to a non-cyclic (hierarchical) ordering.

Table 5.3 Defending-friendship

| Name | Graphical representation | Class I ^a | Class II ^a | Class III ^a | Class IV ^a | Class V ^a | Class VI ^a | Class VII ^b | Meta-analysis |
|--|--------------------------|----------------------|-----------------------|------------------------|-----------------------|----------------------|-----------------------|------------------------|-------------------------------|
| (Name in XPNet) | | Est. (se) | Est. (se) | Est. (se) | Est. (se) | Est. (se) | Est. (se) | Est. (se) | Est. (se) |
| Defending (network A) | | | | | | | | | |
| Arc (<i>ArcA</i>) | | -2.59* (0.62) | -2.69* (0.46) | -3.02* (0.57) | -3.30* (0.76) | -3.64* (1.10) | -2.83* (0.47) | -2.71* (0.66) | -2.86* (0.22) |
| Reciprocity (<i>ReciprocityA</i>) | | -0.15 (0.78) | 0.94 (0.77) | 1.01 (0.63) | 1.35 (0.83) | 1.67 (1.19) | 0.96 (0.62) | 0.74 (0.61) | 0.87* (0.27) |
| Multiple two-paths (<i>A2P-TA</i>) | | -0.04 (0.11) | -0.11 (0.09) | -0.22 (0.11) | -0.20 (0.25) | -0.60 (0.45) | 0.02 (0.10) | -0.28 (0.18) | -0.11* (0.05) |
| Shared in-ties (<i>A2P-DA</i>) | | -0.04 (0.13) | -0.08 (0.06) | 0.22* (0.08) | -0.11* (0.26) | 0.20 (0.24) | -0.03 (0.09) | -0.51 (0.31) | 0.00 [†] (0.07) |
| Transitive closure (<i>AKT-TA</i>) | | 0.51 (0.26) | 0.40 (0.22) | 0.72* (0.22) | 0.32 (0.34) | 0.99 (0.69) | 0.43* (0.21) | 0.40 (0.23) | 0.48* (0.10) |
| Gender interaction (boy=1) (<i>RbA-Attribute1</i>) | | 0.45 (0.71) | -0.62 (0.70) | 3.81* (1.29) | 11.08* (2.26) | 7.19 (4.04) | 1.96* (0.86) | 3.38* (1.44) | 3.25* [†] (1.41) |
| Sender effect (boy=1) (<i>RzA-Attribute1</i>) | | -0.92 (0.50) | -0.06 (0.35) | -1.61* (0.67) | -7.02* (1.96) | -3.81 (4.10) | -1.01* (0.47) | -1.57 (0.96) | -1.19* [†] (0.42) |
| Receiver effect (boy=1) (<i>RrA-Attribute1</i>) | | -0.65 (0.49) | -0.80 (0.45) | -2.26* (1.03) | -4.83 (3.68) | -3.87 (4.21) | -1.23* (0.48) | -1.67 (1.04) | -1.05* (0.26) |
| Friendship (network B) | | | | | | | | | |
| Arc (<i>ArcB</i>) | | -1.67 (1.36) | 0.56 (2.37) | 0.28 (1.60) | 0.59 (1.52) | 1.69 (2.53) | 1.80 (2.92) | -12.89* (2.58) | -1.31 [†] (1.22) |
| Reciprocity (<i>ReciprocityB</i>) | | 1.75* (0.51) | 1.16* (0.54) | 1.03* (0.53) | 0.97 (0.52) | 1.33* (0.46) | 1.36* (0.46) | 0.56 (0.39) | 1.12* (0.18) |
| In-ties spread (<i>In-K-StarB</i>) | | 1.05* (0.45) | 1.76* (0.68) | -0.36 (0.54) | -0.43 (0.60) | -1.93 (1.41) | -1.39 (1.61) | 8.92* (1.44) | 1.05 [†] (1.29) |
| Out-ties spread (<i>Out-K-StarB</i>) | | -1.22 (0.63) | -4.77* (1.35) | -1.48 (0.82) | -1.25 (0.76) | -0.79 (0.66) | -1.41 (0.85) | -2.43* (0.73) | -1.56* (0.29) |
| Multiple two-paths (<i>A2P-TB</i>) | | -0.29* (0.06) | -0.12* (0.03) | -0.21* (0.05) | -0.22* (0.07) | -0.18* (0.08) | -0.22* (0.05) | -0.22* (0.03) | -0.20* (0.02) |
| Shared in-ties (<i>A2P-DB</i>) | | 0.28* (0.08) | 0.63* (0.11) | 0.08 (0.09) | 0.21 (0.11) | 0.17 (0.11) | 0.22* (0.07) | 2.88* (0.46) | 0.56 [†] (0.31) |

| | | | | | | | | | | |
|---|--|-----------------|------------------|------------------|------------------|-----------------|------------------|------------------|------------------|--|
| Transitive closure (<i>AKT-TB</i>) |  | 0.55* (0.24) | 1.48* (0.29) | 1.21* (0.28) | 1.25* (0.29) | 0.60 (0.41) | 0.78* (0.32) | 1.14* (0.26) | 1.02* (0.14) | |
| K-triangles (<i>AKT-DB</i>) |  | -0.33 (0.25) | -0.58 (0.33) | -0.23 (0.22) | -0.79* (0.26) | 0.41 (0.38) | 0.19 (0.29) | -2.00* (0.44) | -0.45† (0.27) | |
| Gender interaction (boy=1) (<i>RbB-Attribute1</i>) |  | 1.14* (0.48) | 1.57* (0.48) | 0.04 (0.34) | 2.98* (1.34) | 1.16* (0.57) | 1.12* (0.45) | 1.44* (0.53) | 1.08* (0.27) | |
| Sender effect (boy=1) (<i>RsB-Attribute1</i>) |  | -0.24 (0.35) | -0.27 (0.25) | 0.03 (0.29) | -0.73 (0.69) | -0.39 (0.32) | -0.18 (0.20) | -0.60* (0.24) | -0.29* (0.11) | |
| Receiver effect (boy=1) (<i>RrB-Attribute1</i>) |  | -0.33 (0.33) | -0.21 (0.31) | 0.06 (0.25) | -1.69 (0.95) | -0.24 (0.43) | 0.12 (0.29) | -1.01* (0.34) | -0.28 (0.17) | |
| Defending friendship | | | | | | | | | | |
| ArcAB |  | 2.14* (0.45) | 1.81* (0.42) | 2.20* (0.47) | 1.78* (0.71) | 1.80 (1.23) | 1.07* (0.38) | 1.27* (0.62) | 1.70* (0.21) | |
| ReciprocityAB |  | 0.70 (0.66) | -0.59 (1.08) | 1.72* (0.62) | 0.54 (0.96) | -1.90 (3.42) | 0.83 (0.55) | 0.99 (0.65) | 0.88* (0.28) | |
| ReciprocityABB |  | -0.09 (0.72) | 1.57 (1.10) | -0.90 (0.59) | 0.40 (1.06) | 3.74 (3.45) | -0.08 (0.58) | -0.69 (0.71) | -0.21 (0.30) | |
| Multiple two- paths of B with cyclic closure of A (<i>CKT-BAB</i>) |  | -0.17 (0.22) | -0.51* (0.20) | -0.63* (0.22) | -0.36 (0.34) | -0.71 (0.73) | -0.54* (0.19) | 0.10 (0.24) | -0.37* (0.11) | |
| Closure of A for shared in-ties of B (<i>DKT-BAB</i>) |  | 0.20 (0.20) | 0.57* (0.17) | 0.04 (0.15) | 0.63* (0.26) | -0.08 (0.29) | 0.42* (0.13) | 0.55* (0.25) | 0.34* (0.10) | |
| <p>Note. Dashed grey circles represent victimized students (i.e., students who could nominate defenders). Dashed arrows represent defending relationships (network A), solid arrows represent friendship relationships (network B). The arrows point from the student giving the nomination towards the student receiving the nomination. The black triangles represent boys.</p> <p>* Parameter is significantly different from zero ($p < 0.05$)</p> <p>† Significant differences between classrooms ($p < 0.05$)</p> <p>^a Subphases=5, max. estimation runs=10, multiplication factor=80</p> <p>^b Subphases=5, max. estimation runs=10, multiplication factor=1000</p> | | | | | | | | | | |

5.3.2 Defending-dislike networks

Table 5.4 displays the results of the analysis of the defending (network A) and dislike (network B) networks. In order to obtain converged models with an acceptable goodness of fit, a sink configuration was added for the defending network of classroom II and an out-star configuration was added for the defending-dislike network of classroom IV. The univariate statistics show that dislike nominations were likely to be reciprocated ($b=1.00$, $p<0.001$). Moreover, students differed in the number of dislike nominations they received from (in-ties spread, $b=0.36$, $p=0.04$) and gave to classmates (out-ties spread, $b=1.03$, $p<0.001$). Students were likely to be disliked by the same classmates (shared in-ties, $b=0.25$, $p<0.001$) and to dislike the same classmates (shared out-ties, $b=0.24$, $p<0.001$).

We expected that defending was unlikely to co-occur with dyadic dislike relationships. Consistent with this hypothesis, we found that it was unlikely that victims gave defender nominations to classmates whom they disliked (arcAB, $b=-1.80$, $p<0.001$) and to classmates who disliked them (reciprocityAB, $b=-2.10$, $p=0.01$). Note that the reciprocityAB parameters of classrooms IV and V had to be constrained in order to obtain converged models.

We hypothesized that defending relationships were likely to occur between students who were disliked by the same classmates, but did not find support for this hypothesis. Finally, as expected we found that defending was likely to occur between students who disliked the same classmates (closure of A for shared out-ties of B, $b=0.28$, $p<0.001$).

Table 5.4 Defending-dislike

| Name (Name in <i>XPNet</i>) | Graphical representation | Class | Class | Class | Class | Class | Class | Class | Meta- |
|--|-----------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-------------------|
| | | I ^a | II ^b | III ^c | IV ^d | V ^b | VI ^a | VII ^d | analysis |
| | | Est. (se) | Est. (se) | Est. (se) | Est. (se) | Est. (se) | Est. (se) | Est. (se) | Est. (se) |
| Defending (network A) | | | | | | | | | |
| Arc (<i>Arc-A</i>) | | -1.74* (0.50) | -1.69* (0.44) | -1.12* (0.52) | -2.40* (0.47) | -1.60* (0.57) | -1.91* (0.41) | -1.95* (0.46) | -1.80* (0.18) |
| Reciprocity (<i>Reciprocity-A</i>) | | 0.64 (0.69) | 1.45* (0.67) | 1.46* (0.59) | 1.97* (0.82) | 2.79* (1.15) | 0.79 (0.61) | 0.82 (0.54) | 1.21* (0.25) |
| Sinks (<i>Sink-A</i>) | | - | 2.56* (0.94) | - | - | - | - | - | - |
| Multiple two- paths (<i>A2P-TA</i>) | | -0.05 (0.09) | -0.23* (0.10) | -0.45* (0.13) | -0.46* (0.22) | -0.80* (0.40) | -0.18* (0.09) | -0.20 (0.12) | -0.24* (0.06) |
| Shared in-ties (<i>A2P-DA</i>) | | 0.08 (0.11) | 0.19* (0.08) | 0.55* (0.12) | 0.38* (0.15) | 0.21 (0.18) | 0.36* (0.08) | 0.05 (0.15) | 0.26*† (0.07) |
| Transitive closure (<i>AKT-TA</i>) | | 0.61* (0.22) | 0.53* (0.19) | 0.48* (0.21) | 0.69* (0.24) | 0.69 (0.55) | 0.47* (0.18) | 0.74* (0.17) | 0.59* (0.08) |
| Gender interaction (boy=1) (<i>RbA- Attribute1</i>) | | 1.90* (0.63) | 0.87 (0.57) | 4.68* (1.46) | 13.51* (2.22) | 10.51* (4.42) | 2.91* (0.90) | 4.61* (1.49) | 4.86*† (1.62) |
| Sender effect (boy=1) (<i>Rsa- Attribute1</i>) | | -1.38* (0.43) | -0.28 (0.22) | -2.19* (0.77) | -7.75* (2.71) | -5.03 (3.76) | -1.33* (0.53) | -2.08* (0.97) | -1.46*† (0.42) |
| Receiver effect (boy=1) (<i>Rra- Attribute1</i>) | | -1.22* (0.43) | -0.81* (0.37) | -2.78* (1.06) | -5.86 (3.99) | -5.40 (4.10) | -1.46* (0.51) | -2.23* (1.01) | -1.30* (0.25) |
| Dislike (network B) | | | | | | | | | |
| Arc (<i>Arc-B</i>) | | -3.64* (0.45) | -5.30* (0.52) | -4.54* (0.84) | -6.05* (0.59) | -5.56* (0.44) | -5.40* (0.83) | -5.46* (0.42) | -5.13*† (0.33) |
| Reciprocity (<i>Reciprocity-B</i>) | | 0.91 (0.55) | 0.91* (0.39) | 1.69* (0.40) | 0.70 (0.43) | 0.96 (0.48) | 0.56 (0.51) | 0.99* (0.41) | 1.00* (0.17) |
| In-ties spread (<i>In-K-StarB</i>) | | 0.17 (0.44) | 0.74 (0.42) | -0.26 (0.53) | 0.14 (0.39) | 0.88 (0.47) | 0.82* (0.37) | -0.05 (0.34) | 0.36* (0.17) |
| Out-ties spread (<i>Out-K-StarB</i>) | | 0.91 (0.55) | 0.69 (0.43) | 1.47* (0.58) | 1.06* (0.42) | 0.57 (0.41) | 0.89* (0.34) | 1.71* (0.38) | 1.03* (0.17) |
| Multiple two- paths (<i>A2P-TB</i>) | | 0.06 (0.09) | 0.00 (0.05) | -0.01 (0.10) | 0.08 (0.08) | -0.07 (0.06) | -0.04 (0.06) | -0.01 (0.07) | -0.01 (0.02) |

| | | | | | | | | | | |
|---|--|------------------|------------------|------------------|------------------|------------------|-------------------|------------------|------------------|--|
| Shared in-ties (A2P-DB) | | -0.04 (0.22) | 0.24* (0.08) | 0.12 (0.15) | 0.21* (0.09) | 0.31* (0.06) | 0.30* (0.05) | 0.13 (0.10) | 0.25* (0.03) | |
| Shared out-ties (A2P-UB) | | 0.17 (0.13) | 0.32* (0.07) | 0.30* (0.10) | 0.18 (0.13) | 0.20 (0.13) | -0.03 (0.16) | 0.23* (0.11) | 0.24* (0.04) | |
| Gender interaction (boy=1) (RbB- Attribute1) | | 1.18 (0.60) | -0.12 (0.47) | -1.47* (0.68) | -2.35* (0.76) | -4.18* (1.16) | -10.15* (2.93) | -0.67 (0.53) | -1.74† (0.92) | |
| Sender effect (boy=1) (RsB- Attribute1) | | -1.15* (0.47) | -0.26 (0.30) | 0.08 (0.42) | 1.70* (0.50) | 1.03* (0.35) | 1.30* (0.44) | 0.35 (0.28) | 0.42† (0.35) | |
| Receiver effect (boy=1) (RrB- Attribute1) | | -0.45 (0.36) | 0.36 (0.25) | 0.74 (0.37) | 1.10 (0.57) | 1.14* (0.36) | 1.32* (0.52) | 0.58 (0.32) | 0.62*† (0.22) | |
| Defending-dislike | | | | | | | | | | |
| ArcAB | | -2.05 (1.10) | -1.68* (0.67) | -2.40* (1.06) | -6.24 (4.12) | -4.45 (5.91) | -1.21 (0.73) | -2.15* (1.09) | -1.80* (0.38) | |
| Reciprocity AB | | -0.49 (0.68) | -0.36 (0.44) | -1.30 (0.70) | fixed | fixed | -1.30 (0.76) | -0.69 (0.66) | -2.10* (0.81) | |
| Outstar (Out2StarAB) | | - | - | - | 0.10* (0.04) | - | - | - | - | |
| Closure of A for shared in-ties of B (DKT-BAB) | | 0.05 (0.28) | -0.03 (0.12) | -0.52* (0.19) | -0.19 (0.38) | 0.05 (0.44) | -0.35 (0.20) | 0.15 (0.26) | -0.16 (0.11) | |
| Closure of A for shared out-ties of B (UKT-BAB) | | 0.54* (0.13) | 0.20 (0.17) | 0.20 (0.14) | -0.26 (0.58) | -0.06 (0.96) | 0.19 (0.17) | 0.20 (0.24) | 0.28* (0.08) | |
| Multiple two- paths of B with cyclic closure of A (CKT-BAB) | | -0.61 (0.42) | 0.02 (0.19) | 0.34 (0.26) | 0.25 (0.61) | 0.12 (1.07) | 0.17 (0.25) | -0.02 (0.34) | 0.07 (0.11) | |

Note. Dashed grey circles represent victimized students (i.e., students who could nominate defenders). Dashed arrows represent defending relationships (network A), solid arrows represent dislike relationships (network B). The arrows point from the student giving the nomination towards the student receiving the nomination. The black triangles represent boys.

* Parameter is significantly different from zero ($p < 0.05$)

† Significant differences between classrooms ($p < 0.05$)

^a subphases=5, max. estimation runs=10, multiplication factor=500

^b subphases=5, max. estimation runs=10, multiplication factor=1000

^c subphases=5, max. estimation runs=10, multiplication factor=160

^d subphases=5, max. estimation runs=10, multiplication factor=320

^e subphases=5, max. estimation runs=10, multiplication factor=80

5.4 Discussion

Defending is important: it may alter the bully's behavior and can provide a buffer against the negative consequences of bullying. The present study aimed to contribute to prior studies on defending behavior by investigating to what extent defending relationships co-occurred with two common types of positive and negative relationships among elementary school students: friendship and dislike.

We argued that students are likely to feel responsible for helping their victimized friends and predicted that defending was likely to occur between students who were friends. We investigated three dyadic friendship variations. The analyses showed that victimized students were indeed likely to give defending nominations to students who they also nominated as their friend. Moreover, we found that victimized students were likely to give defending nominations to students who nominated them as friend.

Consistent with balance theory (Heider, 1958), we found that students were likely to defend the defenders of their defenders and befriend the friends of their friends. We hypothesized that defending was likely to occur between friends of friends and found that defending was more likely to occur when the victim and (potential) defender were both nominated as a friend by other classmates. However, we also found that victimized students were unlikely to give defending nominations to friends of classmates who nominated them as friends. An explanation for this finding is that in positive networks, there is a tendency to have a hierarchical ordering with relatively little cyclic closure. For that reason, longitudinal social network studies using SIENA often find a negative estimate for the three-cycle parameter (Veenstra, Dijkstra, Steglich, and Van Zalk, 2013).

We expected that defending was unlikely to co-occur with dyadic dislike relationships. In line with this hypothesis, we found that it was unlikely that victims gave defender nominations to classmates whom they disliked. In addition, victimized students were unlikely to give defender nominations to classmates who disliked them. Moreover, as the descriptive statistics showed, the victimized students in our sample did not give defender nominations to classmates with whom they had a reciprocated dislike relationship.

Finally, we expected that defending relationships were likely to occur between students who were disliked by the same classmate but did not find support for this hypothesis. Instead, we found that defending was likely between students who disliked the same classmates. It may be that these disliked classmates are the victims' bullies. This explanation is in line with the study of Huitsing and colleagues (2014) who found that victims of the same bullies defended each other.

Consistent with previous studies demonstrating that during childhood and early adolescence social interaction predominantly takes place in same-gender peer groups (Baerveldt, Van De Bunt, & Vermande, 2014; Rubin, Bukowski, & Parker, 2006; Veenstra et al., 2013), we found that defending often occurred in same-gender groups. The strength of the gender effects varied per classroom. That is, in some classrooms no gender effects were found, whereas in other classrooms the defending network was completely segregated. In a larger study classroom gender effects might be further studied.

The findings of this study should be interpreted tentatively. We hope that future studies will repeat our study using a larger sample and students of different age groups.

Future studies may also further investigate differences in defending between classrooms. Moreover, given that defending was measured by reports of victims, it is unclear whether students were actually defended by the classmates whom they nominated as defenders. Although, students were asked to report on *actual* defending, it is possible that victimized students nominated their friends as *hypothetical* defenders, even though they had not actually been defended by these classmates. In other words, students may have nominated friends whom they perceived as potential defenders. Our data did not allow to test whether the nominated defenders confirmed their behavior. Even though it is the *perceived* defending rather than the *actual* defending that affects the victim's well-being (Sainio et al., 2011), it would be interesting to find out whether victims and the students they nominate as defenders agree on their defending relationship.

Furthermore, a rather broad definition of defending behavior was used in this study. Defending was defined as helping, supporting, or comforting the victim. It would be interesting to investigate possible differences between publicly standing up for the victim and more subtle forms of defending behavior, such as comforting the victim after the bullying. In addition, in most studies on school bullying students are considered victimized when they had been bullied at least twice a month, whereas in the present study students were considered victimized when they had been bullied at least once in the past four months.

Despite these limitations, the present study can be considered a first step in investigating defending, friendship, and dislike relationships using a social network approach. We conclude that victimized students were indeed likely to give defending nominations to students who they also nominated as their friend or who nominated them as friend. Moreover, defending was more likely to occur when the victim and potential defender were both nominated as a friend by the same classmates. In addition, we conclude that victims were unlikely to give defender nominations to classmates whom they disliked or who had indicated to dislike them. Finally, we found that defending was likely to occur between students who disliked the same classmates, perhaps the bullies. Given that the strength of some patterns varied per classroom, it seems that classroom characteristics affect defending behavior as well. This may imply that when addressing defending behavior, for instance by anti-bullying interventions, uniform measures may not be adequate. We hope that future studies will follow up on our study and further investigate this.

