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### A social network perspective on bullying

Huitsing, Gijs

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# **Chapter 6**

General conclusions and discussion

## 6.1 General Conclusions and Discussion

Bullying is by nature a phenomenon that exists at a relationship level, and it is of importance to study bullying at this relationship level in its larger context to have a better understanding of bullying processes (Cohen, Hsueh, Russel, & Ray, 2006; Salmivalli, 2010). Bullying ties do not occur in isolated dyads, but exist in larger networks in interplay with relations of diverse kinds. These relations in networks form complex patterns where network ties are dependent on other ties and the position of children in the network. In this dissertation, bullying processes in these complex patterns were studied using a social network perspective.

The studies in this dissertation showed that the network models that have been developed in the past years for positive networks (e.g., Carrington, Scott, & Wasserman, 2005; Lusher, Koskinen, & Robins, 2013; Robins, Snijders, Wang, Handcock, & Pattison, 2007a; Snijders, Van de Bunt, & Steglich, 2010) can be applied to negative networks, of which bullying networks are a specific form. Cross-sectional statistical multiplex network models (multivariate ERGMs) were applied in Chapter 2, in which negative ties of bullying and general dislike were investigated in their interplay with positive ties of general like. This model specification was used in Chapter 3 to examine the participant role approach to bullying in schools (bullying and defending). Generally, Chapters 2 and 3 found patterns of structural equivalence in the interplay between positive and negative networks; there are tendencies toward positive ties between those who are structurally equivalent in the negative network. The sequences underlying these temporal associations were disentangled in a longitudinal design in Chapter 5 (using Stochastic Actor-Based Models). In chapter 4, a multiplex social network approach was also relevant when investigating agreement between different informants on victim-bully relations. Moreover, the network models of Chapter 2 provided knowledge on the structural characteristics of negative tie networks. The accompanying analytical framework with a set of uniplex structural parameters was applied successfully in Chapters 3 and 4.

In the following, first the main findings of the studies in this dissertation will be discussed. This will be followed by a discussion of the implications for our understanding of children's development, scientific implications of a social network perspective for both theory and methodology, and societal and practical implications. Finally, directions for future research will be given.

## 6.2 A Social Network Perspective on Bullying

The results of the social network perspective on bullying that was applied in this dissertation will be discussed along four main findings: (1) the interplay between negative and positive networks; (2) structural characteristics of negative tie networks; (3) child characteristics that

are related to children's involvement in victim-bully relationships; (4) agreement between informants on victim-bully relationships.

**Interplay between positive-negative networks.** The first contribution of this dissertation was that negative tie networks were investigated in their interplay with positive relations. Such a multiplex approach helps to understand the mechanisms that underlie bullying processes and the formation of other negative ties. Investigating bullying in its interaction with other relations provides answers to the main substantive research question of this dissertation; *Which insights into bullying as a relational or group process are given by a social network perspective?*

A multiplex network approach was applied in Chapter 2, in which it was found that there were positive liking ties between those who are structurally equivalent in the negative network (for bullying as well as relations of general dislike). This is explained in more detail in Table 6.1. In the first part of Table 6.1, network patterns are given in which children ( $i$  and  $j$ ) share incoming negative ties (i.e., being mentioned as a bully or being disliked). Bullies who were harassing the same victims had a higher tendency to like each other (note that bullies receive the nominations from victims). Moreover, also children who were disliked by the same peers had a tendency to form a positive tie. Where the first can be seen as strategic goal-oriented behavior of bullies (i.e., by supporting each other, bullies may be more powerful than their victims), the latter can be seen as default selection (Hektner, August, & Realmuto, 2000; Sijtsema, Lindenberg, & Veenstra, 2010), meaning that children have difficulties to befriend the children they want and are forced to befriend children who are also rejected by their peers.

The second part of Table 6.1 shows network patterns in which children ( $i$  and  $j$ ) share outgoing negative ties (i.e., disliking peers or mentioning peers as bullies). For bullying, it was found that children who reported being victimized by the same bullies had a tendency to like each other, which can be seen as social support. For general dislike, however, it was not found that children who disliked the same peers had a tendency to like each other. These differences can be explained by the strength of the outgoing negative tie (Labianca & Brass, 2006). Disliking someone is not threatening and it may not necessary to search for positive protective ties when disliking ties are shared. Bullying relations can be severe threats and children need protection from others when being victimized.

In this way, children's behaviors are guided by a goal frame. Children's goals influence decisions whom to befriend, whom to defend, or whom to bully, because peer evaluations are important stimuli for children. In the goal-framing approach (Lindenberg, 2008; 2013), it is hypothesized that people's observations, evaluations, information processing, and behaviors are influenced by their focal goals. People are aware of situations that are helpful or not for reaching their goals, of which status and affection are important ones for children

Table 6.1. *Multivariate triadic parameters in Exponential Random Graph Models.*

Parameters (statistic)	Description	Graphical representation
Shared incoming negative ties with positive closure (DKT-ABA)	<p><i>For bullying:</i> Bullies (<math>i</math> and <math>j</math>) who were mentioned by the same victims (multiple <math>k</math>'s) had a higher tendency to like (Chapter 2) and defend (Chapter 3) each other.</p> <p><i>For general dislike:</i> Children who were disliked by the same peers (<math>i</math> and <math>j</math> being disliked by multiple peers <math>k</math>) had a tendency to form a positive liking tie (Chapter 2).</p>	
Shared outgoing negative ties with positive closure (UKT-ABA)	<p><i>For bullying:</i> Victims (<math>i</math> and <math>j</math>) who were reporting being victimized by the same bullies (multiple <math>k</math>'s) had a higher tendency to like (Chapter 2) and defend (Chapter 3) each other.</p> <p><i>For general dislike:</i> Children who were disliking the same peers (<math>i</math> and <math>j</math> reported to dislike multiple peers <math>k</math>) were not found to have a higher tendency to form a positive liking tie (Chapter 2).</p>	

*Note.* For bullying, ties in the parameters are directed from the victim to the bully: the sender of a tie is the victim, the receiver of a tie is mentioned as a bully. For general dislike: the sender of a tie dislikes the receiver of a tie.

(e.g., Hawley, 2003; Rodkin, Ryan, Jamison, & Wilson, 2013; Volk, Camilleri, Dane, & Marini, 2012). Bullying has been found to be related to the goal of being dominant (status) without losing affection from other peers (Sijtsema, Veenstra, Lindenberg, & Salmivalli, 2009; Veenstra, Lindenberg, Munniksma, & Dijkstra, 2010; Veenstra, Verlinden, Huitsing, Verhulst, & Tiemeier, 2013). The goal-framing approach was used in Chapter 3 to investigate the interplay between bullying and defending networks. Similar to the Chapter 2 findings, it was found that victims tended to have a positive defending tie to other victims when being victimized by the same bullies (shared outgoing negative ties, see Figure 6.1.a and the second part of Table 6.1). Thus, victims defended each other in their search for support and affection. Moreover, bullies had the tendency to have a positive defending tie to other bullies when

Figure 6.1. Defending among victims and defending among bullies

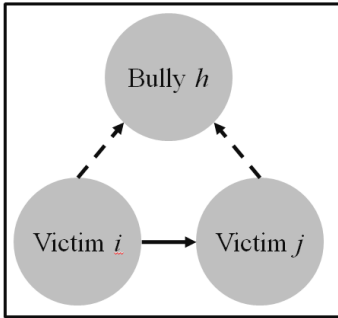


Figure 6.1.a

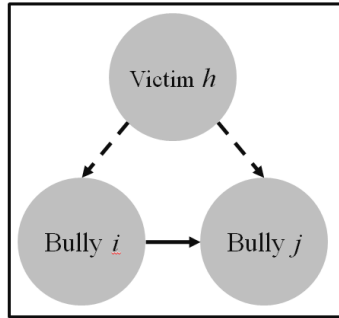
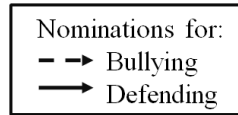


Figure 6.1.b



targeting the same victim (shared incoming negative ties, see Figure 6.1.b. and the first part of Table 6.1). With the support bullies provided each other by defending, they may be more powerful and dominant than victims.

Because the cross-sectional associations between positive and negative networks in Chapters 2 and 3 do not provide information about the causality of relations, Chapter 5 was set up. With a longitudinal social network approach, it was investigated how patterns in the networks of bullying/victimization and defending co-evolve over time. It was found that defending among victims (see Figure 6.1.a) originated from two processes. On the one hand, victims who were victimized by the same bullies were likely to defend each other – in line with the social support hypothesis. On the other hand, findings also demonstrated that

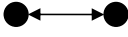
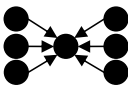
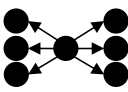


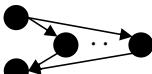
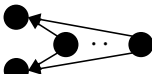
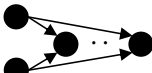
defenders of victims may run the risk of being victimized by the bullies they defend – in line with the retaliation hypothesis (e.g., victim  $j$  in Figure 6.1.a first defends victim  $i$  against bully  $h$ , but is subsequently also victimized by bully  $h$ ). The latter finding suggests that bullies retaliate to defenders when their goals of acquiring status are hindered. Further, defending among bullies (see Figure 6.1.b) originated from two different processes. On the one hand, bullies who targeted the same victims subsequently defended each other – in line with the defending among bullies hypothesis. On the other hand, defenders of bullies were also likely to further support the bully by starting to harass the bully's victim – in line with the initiating bullying hypothesis (e.g., bully  $j$  in Figure 6.1.b first defends bully  $i$  and subsequently also harasses victim  $h$ ). The latter finding suggests that bullies have a strong ingroup of bullies who (mutually) support each other and create an outgroup of victims.

Together, Chapters 2, 3, and 5 provided insights into the underlying mechanisms of bullying processes when bullying was investigated in the larger group context. The results showed that positive and negative ties in networks of children are related and that ties in one network influence the realization of ties in the other. As such, knowledge about children's positive relations (e.g., friendships, defending) contributes to our understanding of the existence and creation of bullying relations.

**Structural characteristics of negative tie networks.** Before the interplay of negative ties with positive ties could be investigated, it was first necessary to have an understanding of the typical structural patterns that can be observed in negative relations. Structural patterns are specific patterns of relationships between children, without accounting for individual characteristics. The second contribution of this dissertation was the knowledge gained about these structural patterns in negative networks, in addition to the existing knowledge about structural patterns in positive networks (e.g., reciprocity and transitivity), providing part of the answer to the methodological research question: *how can models for social network analysis be specified to investigate negative networks?* Table 6.2 provides an overview of the structural parameters that were necessary to be included in the network models to obtain an acceptable model fit (i.e., an estimated model of which the average simulated network structure did not differ significantly from the observed structure). Table 6.2 shows that the negative tie networks of bullying and general dislike have different structures, and require different parameters in the model specification for an acceptable model fit.

An example of a typical bullying network is given in Figure 6.2, which is a simulated network based on the meta-analysis of 18 bullying networks of Chapter 2 (simulations were performed in *PNet*, with 22 students, a fixed density of 5.7%, and parameter values that are given in Table 2.5). The network exhibits variation in the number of nominations children received for bullying. Some children are quite *central* in the network; i.e., they received more

Table 6.2. *Structural parameters in Exponential Random Graph Models for modeling directed negative tie networks.*

Parameters (statistic)	Description	Graphical representation	Bullying	General dislike
<i>Dyadic parameters</i>				
Reciprocity	Occurrence of mutual ties			✓
<i>Degree-level parameters</i>				
In-ties spread (A-in-S)	Dispersion of in-ties distribution (if positive, distribution is dispersed: some actors receive more nominations than others). Also indication of indegree-centrality.		✓	✓
Out-ties spread (A-out-S)	Dispersion of out-ties distribution (if positive, the distribution is dispersed: some actors give more nominations than others).			✓
Isolates	Occurrence of isolated actors (zero indegree and zero outdegree).		✓	
Sinks	Occurrence of actors with zero outdegree and at least one indegree.		✓	
<i>Multiple connectivity and closure parameters</i>				
Multiple two-paths (A2P-T)	Occurrence of (multiple) out-ties and in-ties, or being linked at distance two.		✓	✓
Shared in-ties (A2P-D)	In-ties-based structural equivalence (being nominated by the same actors).		✓	✓
Shared out-ties (A2P-U)	Out-ties-based structural equivalence (nominating the same actors).			✓

Note. Ties in the parameters are directed from the victim to the bully; for bullying: the sender of a tie is the victim, the receiver of a tie is mentioned as a bully; for general dislike: the sender of a tie dislikes the receiver of a tie.

nominations than others (see also Huitsing, Veenstra, Sainio, & Salmivalli, 2012b). For example, child 10 is mentioned by 5 classmates as their bully, child 13 by four peers, and children 8 and 18 are mentioned by three classmates. Many children were not nominated at all. This variation in the number of nominations received was modelled by the *in-ties spread* parameter (see Table 6.2). The networks of bullying were further characterized by children who were reported as bullies but did not report being victimized themselves. Children 3, 8, 10, 13, 14, 16, 18, 21 have incoming ties but do not nominate others for bullying them. In the network models, these bullies were modelled by the *sinks* parameter. Figure 6.2 also shows



that a substantial number of the children were isolated (see the upper left of Figure 6.2; children 1, 2, 6, 11, 15, 19, 22); they were neither bullying others nor being victimized, which was modelled by the *isolates* parameter. In addition to these degree-level parameters, there were also parameters included in the models that characterize larger triadic structures (with three children involved). In Figure 6.2, some children were both mentioned as bullies while reporting being victimized themselves. For example, children 12 and 17 have both incoming and outgoing ties (so-called *two-paths*, see Table 6.2). Moreover, there was a tendency that children were bullying the same classmates, see for example children 8, 14, and 18 who were reported as bullies by children 9 and 20. This was modelled by the *shared in-ties* parameter. Note that with the parameters given in Table 6.2, the outdegree distribution was well fitted, and it was not necessary to include a parameter for pure victims in the model (so-called *sources*, that would model children with at least one out-tie and zero in-ties). Together, these findings of Chapter 2 showed that bullying networks have a centralized structure, with a few children victimizing several peers. Some of these bullies did not report to be victimized themselves (sinks), whereas others did; so-called bully-victims.

Relations of general dislike were also examined in Chapter 2, as another type of negative tie networks. An example of a simulated network for general dislike is given in Figure 6.3 (simulations were performed in *PNet*, with 22 students, a fixed density of 18.3%, and parameter values that are given in Table 2.4). Figure 6.3 shows that relations of general dislike appeared in a relatively dense network, where almost all children were involved in sending or receiving ties, with variation between children in the number of nominations given and received (requiring the inclusion of the *out-ties spread* parameter in addition to the *in-ties spread* for good model fit, see also Table 6.2). There were few isolated children, only children 7 and 12 were isolated. Therefore, the parameter for *isolates* did not need to be included in the models for general dislike. Moreover, relations of general dislike were to some extent reciprocated. In the simulated network, 13 reciprocated dyads were present (modelled by the parameter for *reciprocity*). For example, children 18 and 21 disliked each other. Because a typical network of general dislike is relatively dense, several parameters were included in the network models to account for its dense structure (see Table 6.2 for *two-paths*, *shared in-ties*, and *shared out-ties*). These findings imply that the two negative relations of general dislike and bullying differ in their typical network structures. Bullying relations are characterized by systematic abuse of children who are not able to defend themselves (Juvonen & Graham, 2013; Olweus, 1993; Rodkin, Hanish, Wang, & Logis, 2014), whereas relations of general dislike may lack these power differences.

The data for Chapter 2 came from 18 classrooms from three Finnish schools in late childhood (10- to 12-year-olds). The necessary structural parameters identified in Chapter 2 turned out to be sufficient for modeling the network structure of bullying in 25 Dutch

Figure 6.2. Simulated bullying network

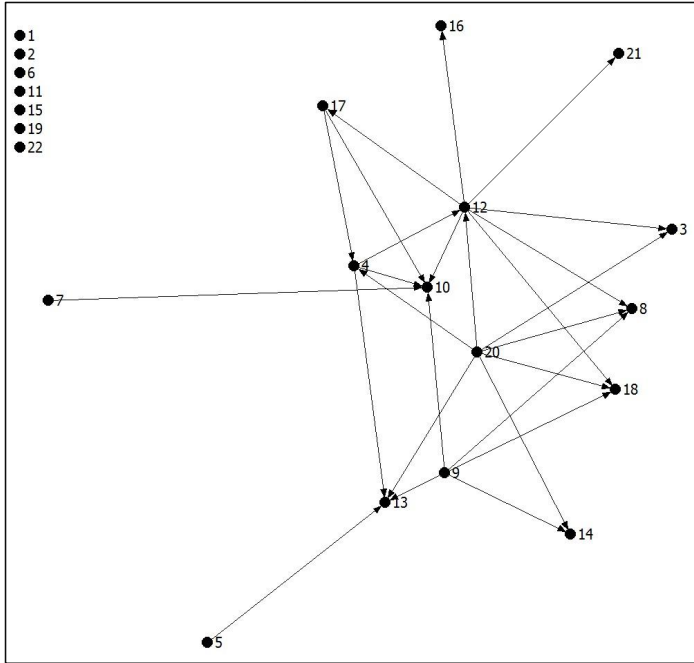
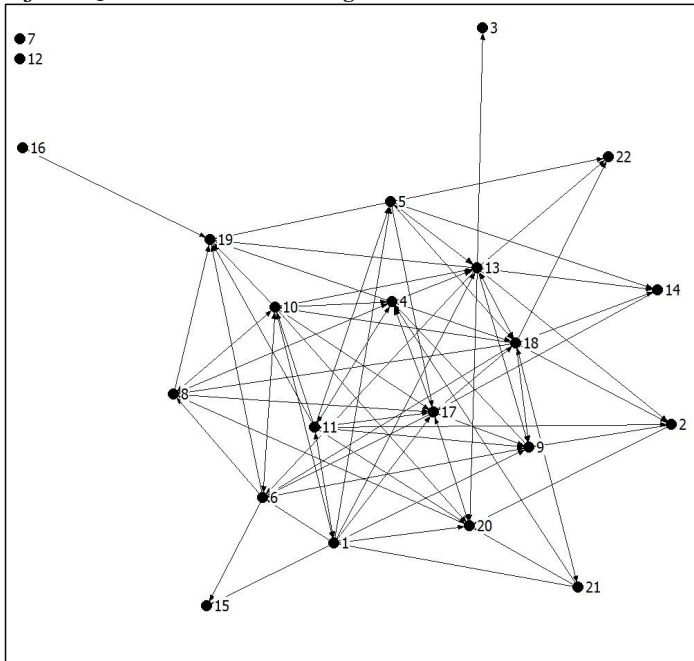


Figure 6.3. Simulated network of general dislike



classrooms in middle and late childhood (Chapter 3, 8- to 12-year-olds) and 25 Swiss kindergartens in early childhood (Chapter 4, 5- to 7-year olds), irrespective of the informant that reported about the bullying (children themselves, peers, or teachers). This reveals that the findings on the network structure of bullying were relatively robust across different samples, in different nations, in different age-groups, with different informants. However, minor differences between the estimated network structures of bullying in different age groups were found. For example, when using peer-reports on victim-bully relations in kindergarten, only a few victims of each bully were reported, and not necessarily all children that are victimized by that bully (i.e., the so-called *shared in-ties* parameter was estimated to be negative, see Chapter 4). It may be the case that reporting multiple victims of bullies (if any) is a too complex task for young children. In addition to the question whether young children in early childhood are able to report more complex network structures, it may also be that bullying networks in early childhood are less complex than in middle and late childhood (see for the development of friendship networks in early childhood, Schaefer, Light, Fabes, Hanish, & Martin, 2010). In addition, the rate of reciprocity was higher in early childhood (Chapter 3: 15%, 20%, and 38% for self-, peer-, and teacher-reports) than in middle and late childhood (9% and 5% in Chapters 2 and 3), suggesting that power differences are less salient for younger children.

**Involvement in victim-bully dyads.** The third contribution of this dissertation relates to child characteristics that may explain children's involvement in victim-bully dyads.

Children's gender is known to play an important role in bullying, with consistent findings that boys are more involved in bullying than girls (see for a review Hong & Espelage, 2012b). Although gender differences were found to be small between boys and girls for indirect aggression (i.e., relational or social) in a large meta-analysis (Card, Stucky, Sawalani, & Little, 2008), boys have been found to be more directly aggressive than girls. When investigating bullying between boys and girls, it was found in Chapter 5 that boys were bullying more than girls, and they bullied boys and girls equally often. When girls were bullying, they were more likely to target other girls than boys. These results are in line with investigations in middle and late childhood (Rodkin & Berger, 2008; Rodkin et al., 2014; Sainio, Veenstra, Huitsing, & Salmivalli, 2012; Tolsma, van Deurzen, Stark, & Veenstra, 2013; Veenstra et al., 2007). Findings in Chapter 4 for early childhood were comparable (see for earlier investigations Hanish, Sallquist, DiDonato, Fabes, & Martin, 2012; Vermande, Van den Oord, Goudena, & Rispens, 2000), but one exception was found: girls were bullying both boys and girls equally when information about victim-bully relations was obtained through self- or peer-reports. With teacher-reports a quite different picture of the gender composition of victim-bully relations emerged. Teachers in Chapter 4 reported same-sex bullying for both boys and girls at similar levels, but reported twice as much girl-girl bullying as the children

did themselves. Moreover, teachers reported less cross-gender bullying compared to same-gender bullying. Especially the extent to which girls were bullied by boys was reported less by teachers.

Internalizing and externalizing behavioral problems were found to be related to children's involvement in victim-bully dyads. In Chapter 4, it was shown that children with internalizing problems were less likely and children with externalizing problems were more likely to be nominated for bullying, which is in line with previous findings (e.g., Hanish & Guerra, 2002; Perren & Alsaker, 2009; Van Lier et al., 2012). Teacher-reports did not differ from children's perceptions with one exception; teachers also nominated children with externalizing problems as victims. These results correspond with previous findings which showed that teacher's observations related to a link between victimization and externalizing behavioral problems (Hanish & Guerra, 2002; Perren, Von Wyl, Stadelmann, Burgin, & Von Klitzing, 2006; Perren, Etekal, & Ladd, 2013; Snyder et al., 2003). Aggressive victims (bully-victims with externalizing problems) may be more salient than passive victims (victims with mainly internalizing problems), which is also reflected in the high reciprocity rate of bullying reported by teachers.

**Informant perspectives.** The fourth contribution of this dissertation was the investigation of the agreement between different informants on victim-bully relations. In Chapter 4, children in kindergarten were each individually interviewed about their own victimization experiences and about the experiences and behaviors of their peers. In addition to children's reports, also teachers provided information about victim-bully relations. Generally, the agreement between children themselves, peers, and teachers was relatively low when concordance for specific victim-bully relations was investigated. On the child level, the agreement was higher, suggesting that the informants agreed to a greater extent on who is victimized and who is bullied than specifically on who is victimized by whom. Agreement was higher for bullies than for victims, meaning that informants reported the same children as bullies but related them to different victims. These findings are in line with earlier investigations (Camodeca, Caravita, & Coppola, 2014; Monks, Smith, & Swettenham, 2003; Perren & Alsaker, 2006). On the one hand, (aggressive) bullies are more visible and salient than (passive) victims. On the other hand, bullying is more stable in early childhood than victimization (Crick et al., 2006; Perry, Perry, & Boldizar, 1990), suggesting that it is more difficult to find agreement on victims when their group position and behavior changes more frequently than that of the bullies.

**A social network perspective on bullying.** The social network perspective used in this dissertation contributed to our understanding of bullying in the larger group context. Employing models for social network analysis, it was shown that the existence and creation of (negative) bullying ties can be partly explained by their association with positive ties. In

Chapter 2, the structural parameter estimates for the negative ties (both bullying and general dislike, see Table 6.2) in the uniplex analyses were considerably smaller in the multiplex analyses, whereas the parameter estimates for the positive ties remained quite stable. In Chapter 5, the structural parameters that account for children's involvement in bullying (either as bullies – indegree-popularity – or as victims – outdegree-activity) dropped significantly when the network dynamics in defending were accounted for. These results suggest that children's involvement in bullying networks is partly explained by the interplay with positive networks, such as general like or defending.

The usefulness of a social network perspective was also demonstrated by findings for the interplay between positive and negative networks at the dyadic, child, and triadic level. At the dyadic level, there was no significant relation between bullying and defending (in Chapter 5, whereas the corresponding parameter was not estimated in Chapters 2 and 3 because it was very rare that children had both a positive and negative tie in the same relation, suggesting a negative association at the tie level). There was also no significant relation between bullying and defending dynamics at the child level (Chapter 5), and the interplay between positive and negative networks at the child level was relatively small in the cross-sectional analyses (Chapters 2 and 3). In Chapters 2, 3, and 5, a significant interplay between positive and negative relations was mostly found in multiplex triadic network structures. These findings demonstrate the usefulness of investigations into positive-negative networks at a social network level, rather than investigations at the child or relationship level. A social network perspective with investigations into triadic structures accounts for the group processes in which bullying and other negative relations are embedded.

### **6.3 A Developmental Perspective on Bullying**

Social network information revealed that being involved in bullying processes may be normative, because many children in the four samples that were part of this dissertation were at least once mentioned for being a bully (62% in Chapter 2; 48% in Chapter 3; 57%, 55%, and 54% for self, peer and teacher-reports in Chapter 4; 57% in Chapter 5) or victim (30% in Chapter 2; 48% in Chapter 3; 55%, 76%, and 75% for self, peer and teacher-reports in Chapter 4; 48% in Chapter 5). Although many of these children may not be severe victims or harsh bullies, the dyadic nominations do indicate that they are sometimes involved in bullying processes. Using more traditional classification measures such as self- or peer-reports with cut-off points to classify children into a "role", a significant number of these children would not be categorized as bullies or victims.

There is some research evidence that the number of self-reported victims decreases when children become older (Hong & Espelage, 2012b; Salmivalli, 2002; Scheithauer, Hayer,

Petermann, & Jugert, 2006; Smith, Madsen, & Moody, 1999), but there is not necessarily a decrease in the number of bullies (Hong & Espelage, 2012b; Pepler, Jiang, Craig, & Connolly, 2008). This suggests that the intensity of being victimized may increase over the years with more bullies and fewer victims. Some suggestions have been made to explain the age decline in victimization (Smith et al., 1999): 1) younger children have more older (and thus, more powerful) children in the school who are in the position to bully them, 2) older children have acquired better social and assertiveness skills to deal effectively with bullying, and 3) younger children have a broader definition of bullying that becomes more narrow as they become older. In Chapter 5, some evidence was generated for the first explanation. In the school-level networks of the upper grades of Dutch elementary schools, there was a clear trend that children were most likely being victimized by children from the same grade or one grade above them. The same applied to defenders, who were also most likely in the same grade or one grade higher. On average, about a quarter of the bullying nominations by victims were given to children who were not in the same grade. The inclusion of age did not further contribute to understanding bullying, suggesting that older children in a grade/classroom did not differ in their involvement in bullying with their younger classmates.

Another explanation for an age decline of self-reported victimization concerns children's understanding about bullying and other negative experiences. Chapter 4 supported the explanation that young children may use a broader definition of bullying. The high number of reciprocal nominations for bullying suggest that power differences between bullies and victims are not salient aspects of victim-bully relations in early childhood. This suggests that single negative incidents, such as aggression, conflicts, or fights, may be reported by children as bullying problems (see also Monks & Smith, 2006). When children grow older, children may be better able to distinguish temporary and systematic negative experiences. Moreover, power differences may become more relevant when "chronic" victims have difficulties defending themselves, leading to a decrease in the number of reciprocal bullying relations.

## 6.4 Some Scientific Implications

What does a social network perspective on bullying contribute to scientific knowledge? This question will be answered by discussing some theoretical and methodological implications.

**Theoretical implications.** Many studies have stated that bullying is a group process (Salmivalli, 2010), few have investigated the mechanisms underlying these group processes. With network analyses, data and methods are available to examine the group structure of larger groups. For example, in Chapter 3, blockmodeling analyses were used to explore the network structure of one classroom. This illustrative classroom provided first insights into the participants' roles in bullying beyond the scope of an individual or dyadic

perspective. One of those insights was the finding that bullies defend other bullies of their subgroup or clique, of whom most were above average popular. In this way, bullies target children from the outgroup and maintain their status while not losing affection from their ingroup. Such ingroup-outgroup processes have already been demonstrated in experimental studies on bullying (Gini, 2006; 2007; Jones, Manstead, & Livingstone, 2009; Nesdale, Milliner, Duffy, & Griffiths, 2009; Ojala & Nesdale, 2004). Defending and supporting ingroup members can be seen as strategic goal-oriented behavior. In the statistical network models, triadic structures (see Figure 6.1) were used which were assumed to function as a proxy of ingroup-outgroup processes.

The studies in this dissertation provided a different interpretation for the participant roles. The insights from Chapters 3 and 5 showed that children's participant roles are dynamic, and can vary given the context and the peers with whom children are interacting. These studies showed that defenders are not only children who dare to stand up for victims, but defenders can also strategically choose to defend popular bullies. It can be argued that bullies need support to have a more powerful position than victims because victims may defend themselves. Bullying and defending may therefore be seen as dynamic processes (Adler & Adler, 1995; Goodwin, 2002). Previous investigations found defenders to have above average levels of empathy (Caravita, Di Blasio, & Salmivalli, 2009; Gini, Albiero, Benelli, & Altoè, 2007; Pöyhönen, Juvonen, & Salmivalli, 2010). It can be questioned whether and how defenders of victims differ in their personal and social characteristics from defenders of bullies. It can be expected that defenders of bullies gain some of bullies' popularity when bullying is the norm in classrooms and highly rewarded by peers (Dijkstra, Lindenberg, & Veenstra, 2008; Dijkstra, Cillessen, Lindenberg, & Veenstra, 2010; Reijntjes et al., 2013). By asking *who defends whom*, future studies may use a social network perspective to distinguish different kinds of defenders.

**Methodological implications.** In the first place, this dissertation showed that bullying can be studied using social network analysis. Many of the available network analytical methods were developed for the analysis of networks with a positive interpretation, which could have had limitations for the analysis of negative networks. Negative networks are usually sparser than positive networks, with the implication that networks with fewer ties will have less structure. The networks models of Chapters 2 and 3 had a better fit after adjusting the triadic effects into so-called *alternating* triadic effects, to prevent "explosion" of estimations and allow modelling of multiple clusters (see, e.g., Snijders, Pattison, Robins, & Handcock, 2006). In addition, bullying is a sensitive topic, and not all children may be willing to answer questions about painful experiences. It can be that children ignore their victimization ("deniers") or that they are overly sensitive to signals from peers ("paranoids"), reporting easily being victimized (Graham & Juvonen, 1998; Perry, Kusel, & Perry, 1988;

Scholte, Burk, & Overbeek, 2013). Despite these challenges, the studies of this dissertation showed that negative relations can be investigated using network analyses (see also Robins, Pattison, & Wang, 2009).

Second, the networks models that were proposed in Chapter 2 to investigate networks of bullying and defending on their own were proven to be useful when analyzing network data collected by other designs and in other populations (Chapters 3 and 4). Neither differences in ages (ages range from 5- to 12-years-old in the four studies) nor differences in data collection methods (paper-and-pencil questionnaires, computer-based questionnaires, child interviews) were related to substantially different network structures. The proposed network models may be helpful for future studies on victim-bully relations or other networks with a negative meaning.

Third, a promising analytical approach is the joint study of positive and negative networks. In a multiplex approach, it was shown in this dissertation that positive and negative ties are to some extent conditioned by each other. Negative ties do not form in isolation, but children who are involved in bullying also have friends or defenders. This dissertation showed that children's negative relations are influenced by positive ties. The positive ties are part of the mechanisms that underlie the formation and realization of bullying ties.

Together, the studies of this dissertation showed that social network analysis can be applied to bullying relations in schools. The analytical framework used in this dissertation can be seen as a starting point for further investigations into negative relations in other contexts, such as workplaces, prisons, or residential care homes (Barling, Dupré, & Kelloway, 2009; Monks et al., 2009; Samnani & Singh, 2012; Trompetter, Scholte, & Westerhof, 2011).

## **6.5 Societal and practical implications**

In the introduction of this dissertation it was already mentioned that given the detrimental consequences of bullying for both victims (Arseneault, Bowes, & Shakoor, 2009; Hawker & Boulton, 2000; Reijntjes, Kamphuis, Prinzie, & Telch, 2010) and bullies (Ttofi, Farrington, Lösel, & Loeber, 2011; Ttofi, Farrington, & Lösel, 2012), investing in bullying research and interventions can be seen as an important step towards prevention of costs for societies. Research has shown that early investments in children's development have larger benefits than investments at later ages (Heckman, 2006). Translating research findings into practical implications can make a substantial contribution to reducing bullying problems (Swearer, Espelage, Vaillancourt, & Hymel, 2010). It is important that policy makers, school principals, and teachers are motivated and willing to invest in bullying prevention programs. In the following, implications of a social network perspective on bullying will be discussed for



signaling bullying and reinforcing innovations for anti-bullying programs.

First, in order to stop bullying problems it is important that bullying is signaled and recognized by teachers before action can be undertaken. Social network information can be used to inform teachers about the victim-bully dyads in their classrooms and the larger group structure (for example, to support them with a figure of a social network, see also Chapter 3). Teachers may benefit from information on the social processes in their classrooms. Findings from Finland showed that only a minor percentage of the victims were helped by school staff in solving bullying problems (Sainio, Turonen, Poskiparta, & Salmivalli, 2011a), and the findings of Chapter 4 showed that teachers reported differently on victim-bully relations than children themselves (especially reporting less cross-gender bullying).

Some attempts to improve signaling have been made in the evaluation phase of the implementation of the KiVa anti-bullying program in the Netherlands with the addition of one additional component to the original Finish version: KiVa+ (Huitsing & Veenstra, 2012b; Veenstra et al., 2013b). In KiVa+ schools, teachers received a report with feedback containing also social network information. An important question is whether such feedback contributes to teachers' signaling of bullying, and if so, how teachers will use this information. Teachers have several possibilities in using social network feedback. For example, it could be that teachers will support victims sooner if the feedback helps teachers to signal these victims. Moreover, the social network information might also contribute to teachers' view on the group structure in their classroom, for example, about the peer leaders and popular children of the classroom who could enhance the impact of an intervention (Dijkstra et al., 2008; Miller-Johnson & Costanzo, 2004). As another example, teachers can use the insights when forming a support group for victims (Robinson & Maines, 2008). The support group might be more successful in improving the daily life of victims when its composition reflects the composition of the hierarchical structure of the classroom.

Second, understanding mechanisms behind bullying may reinforce innovations for anti-bullying programs. The findings of this dissertation correspond to the assumption that children behave in line with their goal pursuit, and their involvement in bullying and defending processes can be seen as strategic goal-oriented behavior that often relates to social status (Caravita et al., 2009; Dijkstra et al., 2008; Hawley, 1999; Volk et al., 2012). Group processes may develop into strong ingroup-outgroup dynamics where children are mean to peers who are part of the outgroup. In such subgroups or cliques, there can be a strong informal group pressure to make children behave in line with the group norms. In such situations, teachers and peer leaders should show their strong disapproval of bullying. Bullying may decrease when teachers are strongly and continuously activating the normative goal that it is important to stand up against bullying (Veenstra, Lindenberg, Huitsing, Sainio, & Salmivalli, 2014). A good anti-bullying program or program that facilitates social-

emotional learning includes several concrete and practical exercises to achieve a better classroom climate and to teach children about group dynamics (Salmivalli, Kärnä, & Poskiparta, 2010b).

## 6.6 Directions for future research

In the foregoing, some directions for future research have already been touched upon. For example, the effectiveness of KiVa+, the contribution to signaling bullying by providing teachers feedback with social network information, the conditions under which defending is strategic behavior, and network analyses of negative relations in other contexts than schools are all worthwhile to investigate. The social network perspective that was applied in this dissertation provides some methodological and substantive directions for future research.

**Methodological research issues.** The first direction for future research is the continuation of investigations into the simultaneous development of multiple networks. The studies in this dissertation showed that the development of positive and negative networks are dependent. A first fruitful way to continue this research on peer selection is to examine how ties in one network relate to creating, maintaining, or dissolving of ties in another network. Another way is to examine peer influence processes, by investigating the dynamics in positive and negative relations and its interplay with the development of children's behavior, adjustment, and school performance. In that way, it can be investigated whether negative relations do not only influence the formation of positive relations but also have their implications for children's development.

The second direction for future research concerns the network boundaries, which means the different contexts at which relational data is gathered. In Chapter 5, the network nominations on bullying and defending were collected in the upper grades of elementary schools. A substantial percentage of these defending (18%) and bullying (27%) ties were outside the classroom. This suggests that these peer processes are not limited to the classroom, but expand to grades, schools, or out-of-school networks. It can be questioned how important the different contexts are for our understanding of peer processes. For example, one may wonder whether it makes a difference for children's adjustment to be victimized by classmates or by children in a different classroom (in the same school). It can be investigated whether children who are victimized by peers who are not in their classroom (the outgroup) may be easier defended by their classmates (the ingroup), and how the (triadic) network processes differ when bullying takes place in the wider group.

Third, from a developmental perspective it is important to investigate when social network processes dynamics emerge, peak, and desist. This is called time heterogeneity (Lospinoso, Schweinberger, Snijders, & Ripley, 2011). Schaefer and colleagues (2010) showed

that complex network structures at the larger group level such as transitivity increased in importance over time during the preschool period. The development of bullying processes and the interplay with, for example, defending can also be studied from such a developmental perspective. New techniques are available to study time heterogeneity of bullying processes across grades or samples (e.g., primary versus secondary school), but also within samples (e.g., to detect at which time point effects are strongest, see: Lospinoso et al., 2011).

**Substantive research issues.** One question that requires further research is the chronicity of specific victim-bully relations. Many studies documented that victimization as well as bullying can be very stable (e.g., Kochenderfer-Ladd & Wardrop, 2001; Kumpulainen, Rasanen, & Henttonen, 1999; Pepler et al., 2006; Rosen et al., 2009; Scholte, Engels, Overbeek, De Kemp, & Haselager, 2007). Bullying and victimization, however, may not be that stable at the relationship level. Chapter 5 of this dissertation was the first investigation into the developmental dynamics of victim-bully relations. There were three assessments. The time between T1 (May 2012) and T2 (October 2012) was about five months, with a transition to the next grade in a new school year in between. The time between T2 and T3 (May 2013) within the same school year was about seven months. For the three schools, the average stability for defending between the assessments was 25%. The average stability for bullying was 16%. This means that less than a quarter of children's bullying relations at an assessment were still present five or seven months later. At the individual level, bullying and victimization were more stable. This raises questions about the endurance of specific victim-bully relations. Future studies can explore the necessary time frame between data assessments to study the endurance of specific victim-bully relations. With computer-based questionnaires on, for example, tablets or smartphones, it is nowadays relatively easy to collect regularly data in classrooms.

The findings from chapter 5 showed that some defenders of victims run the risk to become victimized themselves. These findings suggest that defending may sometimes be a risky strategy. It is important to examine under which conditions defending will be a risk factor for victimization, because the consequences of defending differed between schools (see Chapter 5) and possibly also between classes. Answers may be found in the social status of defenders, defended victims, and bullies. Moreover, the context can also have its impact on the consequences of defending. It can be expected that under a normative anti-bullying intervention, defending of victims will be much more rewarded by classmates than in classrooms where bullying is normative behavior (e.g., Dijkstra et al., 2008; Veenstra et al., 2014). When there are clear anti-bullying attitudes that are clearly expressed by children and teachers, it can be expected that retaliation of bullies will be strongly disapproved of the social context.

Finally, with the social network perspective it will be possible to open the black box of

interventions. Most effectiveness evaluations of interventions are so-called “black-box evaluations”. There is a pre-assessment, the intervention that aims to reduce problem behaviors is implemented, and there is a post-assessment where the problem behaviors are hopefully diminished. With a social network perspective, it is possible to investigate the micro-mechanisms of change, because changes at the relationship level can be investigated. For example for an anti-bullying program, it can be investigated whether retaliation of bullies is less prevalent in intervention schools when compared to control schools.

In sum, although the studies included in this dissertation provided answers to several questions with regard to the networks of bullying and the interplay with other positive relations, they also give rise to many other questions that deserve attention in future research. In addition, effectiveness analyses of interventions as well as school personnel may benefit from the more detailed knowledge that is generated by a social network perspective about children’s peer relations in complex group dynamics.

