ANTECEDENTS AND CONSEQUENCES OF HELPING AMONG ADOLESCENTS

LOES VAN RIJSEWIJK

Antecedents and consequences of helping among adolescents

Loes van Rijsewijk

Antecedents and Consequences of Helping among Adolescents

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Bij de boterham met pindakaas en hagelslag vertelt onze achterkleinzoon over een vriendje, Marijn.

"Wie is Marijn?"

"Een klasgenootje."

"Een klasgenootje? Wat is dat voor een nootje: een walnootje, een okkernootje...?"

"Nee, geen nootje, een klásgenootje..."- denkt even na - "dat komt van genieten."

Naar Peter Vormer, NRC, 05-12-2017

Contents

Chapter 1

Introduction: Navigating the turbulence of adolescence

Navigating the turbulence of adolescence

The transition from elementary to secondary school goes along with a myriad of social, cognitive, and biological developments (Steinberg & Morris, 2001), making the onset of adolescence a challenging period in life. Not surprisingly, adolescence has been described as a period of *storm and stress*, in which conflict with authority figures, mood swings, and antisocial behaviors are more likely to arise (Hall, 1904). As adolescents enter secondary school at about age 12, they start living their lives more independently from their parents as their activities and interests center around those of their peers (Allen & Land, 1999; Berndt, 1982; Larson & Richards, 1991). At the same time, adolescents have to cope with the new responsibilities secondary school demands, get to know their new classmates, and deal with puberty and its physical and cognitive changes. These challenges can be stressful for adolescents, as illustrated by the following (translated) quotes of early adolescents participating in my studies, after being asked to describe unpleasant experiences that occurred to them during the last couple of months:

> 'I hoped secondary school would be a fun time with new kids and new friends, but actually it was quite disappointing'
>
> 'I have gotten my first period'
>
> 'My parents often yell at me if I do not listen to them, which I do not like because it is too noisey for my ears'
>
> 'I have got a broken heart ... Teenage drama and stuff'
>
> 'These stupid school projects... They make me stress out and I think I am allergic to stress'
>
> 'I am fighting with myself about what I want'

In dealing with these hassles, it might stand to reason for adolescents to turn to individuals who already dealt with these issues – parents. However, whereas parents likely know best how to address these issues, adolescents seek to become more independent from their parents and want to take their own decisions, irrespective of their parents' opinions. Instead, the opinions and behaviors of peers become a more salient guideline for how to behave and which decisions to take. However, previous research on the role of peers' opinions and behaviors in the lives of adolescents have highlighted the peer context as socializing agent for risky behaviors. Indeed, many risk behaviors (e.g., substance use, delinquency, aggression) take place in the presence of peers (Erickson & Jensen, 1977; Gardner & Steinberg, 2005; Lahey, Moffitt, & Caspi, 2003) and peers may influence each

other's risk behaviors through imitation or encouragement (see Dishion & Tipsord, 2011), suggesting that the peer context puts adolescents' healthy development at risk. Amongst the most frequently cited papers concerning peer influence discuss how peers contribute to (the preference for) adolescent risk taking (Gardner & Steinberg, 2005), substance (ab)-use (Borsari & Carey, 2001; Ennett & Bauman, 1994), and delinquency (Warr & Stafford, 1991), suggesting that many researchers have attempted to understand the role of peers in the development of adolescent risky, negative behaviors.

THE PEER GROUP AS A POSITIVE CONTEXT

Although research findings on the undesirable features of the peer context are compelling, this research does not do justice to the positive role peers unquestionably fulfill in the lives of adolescents: Peers may actually help adolescents – in an adaptive way – to navigate the turbulent life-stage they are in:

> 'I have very loving friends who help and support me'
>
> 'I am very worried about the fights my parents have, but I have a good friend with whom I talk about it'
>
> 'One of my friends has a problem, but I will not tell what it is about because he trusted me that I would not tell anyone'
>
> 'The father of a girl I know from the horse-riding club has passed away'
>
> 'I heard my best friend has a lot of fights at home'

These quotes illustrate how the peer group may function as a positive and supportive environment in which adolescents care about each other, and underline the notion that peers take up a central role in the support network of adolescents (Del Valle, Bravo, & López, 2010; Helsen, Vollebergh, & Meeus, 2000; Hombrados-Mendienta, Gomez-Jacinto, Dominguez-Fuentes, Garcia-Leive, & Castro-Travé, 2012).

The general aim of this thesis is to understand the positive role peers may play in the lives of adolescents in general, and to understand their role in adolescents' support network in particular. In the remainder of this introduction, I will clarify which problems adolescents experience and may need help with, which adolescents are typically involved in giving and receiving help, what the scientific and societal relevance of this dissertation is, and how social networks play a prominent role herein. The chapter ends with the central research question and an overview of the chapters of this dissertation.

DAILY HASSLES

Individuals all experience problems at some point and to some degree, as do adolescents. Over the years, researchers have investigated stressors, hassles, and negative life events adolescents generally experience (e.g., Ames et al., 2005; Compas, Davis, Forsythe, & Wagner, 1987; Wright, Creed, & Zimmer-Gembeck, 2010). An exemplary study describing the types of hassles adolescents are confronted with was done by Fallon and Bowles (1999), who asked 1,022 11 to 18 year old adolescents to describe one major and one minor problem they experienced during the last six months. Results showed that major and minor daily hassles were (in order of frequency) primarily experienced in the domains of family, interpersonal relationships, education, and health.

To give an impression of the problems participants in my studies experienced, I made an overview of the unpleasant events they said they experienced during the last and current school year, compiling their answers over six waves. 1,013 participants reported one or multiple negative events (N = 1,714) during this period of time. I compiled these problems into several categories, which are displayed in Table 1.1, together with the frequency with which participants mentioned events of this category. Many negative events had to do with the death or health of others, such as family members, friends, neighbors, schoolmates, or acquaintances. Many participants reported issues with their pets; 9% reported the death or health issues of pets as a negative event. Social problems were also frequently mentioned as negative events; participants reported on, for instance, being bullied or teased, having fights with friends, feeling left out, or missing friends. Participants were sometimes worried about their own mental or physical health (6%), and about school related issues (e.g., receiving low grades, having to do homework, or not passing a test; 3%). Other important categories were problems within the family, such as fights with parents or siblings (4%) or fights between parents or parental divorce (2%). 26 participants (2%) did not want to elaborate on negative events.

Across all categories, girls more often reported problems than boys (56%). Differences were more pronounced regarding health issues of family and others, fights with parents, social problems, and the death or health issues of pets, where 70% of the reporters of problems in these domains were girls (see also Fallon & Bowles, 1999). Less pronounced were sex differences regarding the reporting of own health problems, deceased family or others, or parental fights or divorce (about 60% girls). Furthermore, boys and girls reported school problems and 'other' problems to the same extent. Strikingly, boys slightly more often than girls indicated that their problems were 'private', 'none of your business' or 'not something I want to talk about' (about 60% boys).

Most participants experiencing problems reported that they received support of their peers: Of the participants that indicated to have experienced something unpleasant during the past two school years, 92% of indicated on at least one time point that they received help from at least one classmate, whereas 8% did not. In the following, a more

detailed notion is given of help in adolescence; what is help, what is the role of peers in adolescents' network of helpers, and which adolescents typically receive and give help in the peer context?

DEFINITION OF HELP

Help arguably falls under the broad concept of prosocial behavior, which has been defined as '*voluntary behaviour that benefits others or promotes harmonious relations with others*' (Dovidio, Piliavin, Schroeder, & Penner, 2006; Eisenberg et al., 1999). The many supportive behaviors that exist have been grouped into four broad categories (House, 1981; Tardy, 1985): Emotional support (e.g., provision of care, or listening), informational support (e.g., provision of information or advice) appraisal (e.g., provision of feedback), and instrumental support (e.g., provision of materials or money). The results of a focus group study (Bergin, Talley, & Hamer, 2003) among 11 to 13 year olds suggested that particularly the alleviation of negative emotional states is a salient form of help that adolescents exchange with their peers (see also Dunfield, 2014). Other types of help that participants described were helping to develop skills, such as sports and school related skills, and providing instrumental support. The common ground of all forms of help is that they provide the receiver of support with the feeling '*...that one is cared for, esteemed, and part of a mutually supportive social network*' (Taylor, 2011).

In this dissertation, adolescents' network of helpers is identified using a so-called peer nomination technique. Peer nominations have been frequently used to identify relations or interactions between individuals – for example, friendships, liking, and also helping (see Baerveldt, Van Duijn, Vermeij, & Van Hemert, 2004; Dijkstra, Lindenberg,

Table 1.1
Categories and frequencies of reported 'unpleasant events' (*N* events = 1,714)

Category	Frequency	%
Death (relative)	418	24
Death (other person than relative)	217	13
Health issues (relative)	216	13
Pet (death, illness)	155	9
Social (e.g., bullying, having fights with friends, feeling left out, …)	144	8
Health issues (self)	97	6
Other minor (e.g., losing a soccer match, biking in the rain, …)	84	5
Death of teacher	83	5
Fight (with parents or siblings)	72	4
Health issues (other person than self or relative)	61	4
School (e.g., receiving low grades, having to do homework, not passing a test, …)	56	3
Other major (e.g., father/mother fired, moving houses, …)	48	3
Fight between parents or parental divorce	37	2
No elaboration on event (e.g., 'private', 'none of your business')	26	2

Verhulst, Ormel, & Veenstra, 2009). Following this procedure, I asked participants to identify classmates who '*help you with problems (for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down)*'. The types of help included in this question capture examples of the most salient forms of help for adolescents as identified by previous researchers (Bergin et al., 2003; Dunfield, 2014); practical (instrumental, informational) and emotional support. By asking participants about peers who help them in general instead of asking about specific, single instances of help, I aim to capture a longer standing relationship, providing a receiver of help with the feeling of '*being part of a supportive social network*' (Taylor, 2011).

THE ROLE OF PEERS AS A SOURCE OF HELP

Among adolescents that seek help, most of them turn to non-professional sources of help rather than teachers, (school) counselors or doctors. Indeed, family and peers are the most prominent sources of help (Fallon & Bowles, 1999). As children transition into adolescence, friends and classmates take up a more prominent role as helpers whereas the role of parents decreases (Del Valle et al., 2010; Helsen et al., 2000; Hombrados-Mendienta et al., 2012). Adolescents may, however, either turn to parents or peers depending on the type of support they need – although it is difficult to establish clear patterns as of yet. Both parents and peers provide emotional and practical support (e.g., Hombrados-Mendienta et al., 2012; Reid, Landesman, Treder, & Jaccard, 1989), but it is unclear how often parents or peers are consulted for each specific type of support. There are indications that peers are more often consulted in case of relational issues with family or peers, whereas parents are more often consulted in case of health problems or (school) stress (Fallon & Bowles, 1999; Sullivan, Marshall & Schonert-Reichl, 2002). Similarly, researchers argued that one of the prime reasons to consult parents is to take advantage of their expertise, whereas help among peers also functions to strengthen relationships and provide companionship (Reid et al., 1989; Sullivan et al., 2002).

Thus, although the magnitude of the role peers play in the provision of specific types of help is unclear, it is known that they play a substantial role in adolescents' network of helpers, and that this role gains importance during the transition to adolescence. In this dissertation, I will further examine the peer help network during this transition.

WHICH ADOLESCENTS TYPICALLY GIVE AND RECEIVE HELP?

Although it is clear that adolescents receive help for their problems and whom they generally consult, it is less clear *which* adolescents typically receive help. That is, to my knowledge, little is known about which characteristics are associated with help with daily hassles. There is some research examining facilitators and barriers to (professional) help seeking for (clinical) mental health issues (e.g., Frojd, Marttunen, Pelkonen, Von der Pahlen & Kaltiala-Heino, 2007; Gulliver, Griffiths, & Christensen, 2010; Schonert-Reichl & Muller, 1996; Sheffield, Fiorenza, & Sofronoff, 2004) and for academic problems in the classroom context (e.g., Newman & Schwager, 1993; Ryan, Gheen, & Midgley, 1998;

Ryan, Pintrich, & Midgley, 2001), and it has become clear that girls seek help more often than boys do (e.g., Gulliver et al., 2010; Maccoby, 1990; Rickwood & Braithwaite, 1994; Schonert-Reichl & Muller, 1996).

Relative to the help seeking literature, more is known about who gives help – that is, more is known about who is generally more prosocial than others (see for a review Eisenberg, Fabes, & Spinrad, 2006). As helping others requires some ability to orient on others' needs, associations have been found between prosociality and the ability to emphasize or sympathize with others (e.g., Carlo, McGinley, Hayes, Batenhorst, & Wilkinson, 2007; Eisenberg, Guthrie, Murphy, Shepard, Cumberland, & Carlo, 1999; Eisenberg, Miller, Shell, McNalley, & Shea, 1991). Additionally, researchers focused on associations with behaviors such as aggression (Persson, 2005), and with acceptance within the peer group (Card, 2010; Pakaslahti, Karjalainen, & Keltikangas-Järvinen, 2002; Wentzel & McNamara, 1999). However, prosociality is a construct that comprises a multitude of behaviors (e.g., sharing, defending, volunteering, being nice), of which helping is just one part. Therefore, it is known who is generally more prosocial, but not necessarily who is more helpful in particular.

Looking at this short overview, it seems that little is known about predictors of receiving and giving help in the peer context. Most importantly, however, it shows how giving and receiving help are primarily viewed from an individual perspective. That is; the vast majority of studies focused on helping as individual characteristic. Thus, adolescents were expected to give or receive help to a greater or lesser extent just like they can achieve high or low grades in school, or experience depressive symptoms more or less frequently. Researchers were primarily interested in explaining why certain adolescents were more helpful (actually, prosocial) or tended to seek help more often than others.

Although it has been acknowledged that helping is a social behavior (i.e., intended to benefit others or relations with others), this social aspect has hardly been explicitly acknowledged in theory and research designs: It has been investigated who is helpful, but not who is helpful *towards whom*. This is important, given that adolescents might be helpful towards some peers, but not towards others (Boxer, Tisak, & Goldstein, 2004; Hawley, 2003). For example, girls tend to help more often, but they might primarily help other girls and not boys (e.g., Baerveldt, et al., 2004; Nelson-Le Gall, & DeCooke, 1987). Similarly, when looking at barriers or facilitators to seeking help, or at the consequences of receiving help for adjustment, one should take into account the characteristics of the (potential) helper. For example, receiving help with school work might be useful only when one's helper is doing well in school.

Thus, the concept of help becomes more complex if the inherently relational nature of help is taken into account, that is, if it is taken into account that help is directed towards or sought from other adolescents who have particular characteristics. Taking this into account may add a different perspective to findings from previous, individually focused, research. In the following, I will specify what a relational approach to help entails, and how I aim to advance research on adolescent help in the peer context.

A RELATIONAL APPROACH TO HELP

A way in which the social, relational character of help can be taken into account is by conceiving of help as a social network. By taking a social network perspective, I shift the focus from studying an individual and its characteristics in isolation to studying the relations of individuals with their (social) environment.

Social relations between individuals can be captured by using the above-mentioned peer nomination procedure. Usually, a peer nomination question (e.g., "*Who helps you*") is followed by a list of class– or schoolmates. Students are asked to identify class– or schoolmates who fit the description in the question best. In research on adolescent development, peer nominations have often been used as a means to gain insight into someone's social standing in the classroom, by summing incoming nominations on, for example, popularity ('*Who is most popular?*'; Dijkstra, Cillessen, & Borch, 2013), friendship ('*Who is your best friend?*'; Wentzel & Asher, 1995), or peer rejection ('*Who do you dislike?*'; Card, 2010). These peer nominations can also be used to study relations between a nominator and its nominee(s) (for example: '*Michael dislikes Anna*', or '*Jonathan is friends with Lisa and Max*'); or to construct entire networks of relations (for example; '*There are 12 students who dislike each other in this classroom*', or '*Friendships in this classroom tend to cluster in groups*').

To be able to analyze these nominations using social network analysis, the collection of all nominations in a classroom (or grade, or school) should be turned into adjacency matrices indicating whether (1) or not (0) pairs of individuals are adjacent (i.e., connected) through a nomination from one person to the other and/or vice versa (Table 1.2). A sociogram, in which individuals are depicted as nodes and their relations or interactions as arrows, is a visual representation of an adjacency matrix (Figure 1.1), showing how a social network of relations simply consists of a collection of individuals (called nodes) and the relationships or interactions between them (called ties).

Looking at social networks, one can distinguish several levels of analysis: The level of the individual, the dyad (a set of two individuals), and groups (for example, triads, cliques, or an entire classroom). Furthermore, the individuals in the network can be connected through multiple relationships: For example, individuals may not only help each other, but may also be befriended. Finally, the individuals in networks have particular characteristics, such as a sex or a level of academic achievement. These characteristics can be predictive of sending or receiving nominations (e.g., girls may help others or receive help more often), or can be the outcome of relationships (e.g., help may affect achievement).

This dissertation will shed light on these aspects, and will address issues concerning (1) the different levels of the help network (2) the role of individual characteristics in explaining help networks (3) the overlap of the help network with the friendship network and (4) the role of help in the prediction of individual outcomes. In Chapter 2, I will address individual predictors of giving and receiving help, and will

Table 1.2

Adjacency matrix of one fictitious classroom at one time point, indicating whether (1) or not (0) an individual nominates another individual as helper. Individuals can also be missing (NA) at a particular time point

	1	2	3	4	5	6	7	8	9
1	-	1	0	0	1	0	0	0	1
2	1	-	1	0	0	0	0	0	0
3	0	0	-	1	0	1	1	0	1
4	0	0	0	-	1	0	0	0	1
5	NA	NA	NA	NA	-	NA	NA	NA	NA
6	1	0	0	0	0	-	0	0	0
7	0	1	1	0	1	0	-	0	1
8	0	0	0	0	0	0	0	-	0
9	1	0	0	0	0	0	1	0	-

predict help in dyads with individual characteristics: Who helps whom? In Chapter 3, I will examine the overlap of help with friendships, and address how these relations may simultaneously develop over time. In Chapter 4, I examine how help manifests itself on the classroom level, how individuals are embedded in these classroom help networks, and how the help network and the individual position in this network affect academic achievement. In the last empirical chapter, Chapter 5, I examine how help affects the development of depressive symptoms.

Chapter 2. Who helps whom?

Importantly, receivers of help and helpers are not isolated from each other, as helping is a social behavior through which individuals are connected. Although some studies have sought to identify givers and receivers of help, it is relatively unknown between which adolescents help takes place. I propose that helping others is in part motivated by concerns about with whom adolescents want to (be) associate(d). Specifically, I test whether the similarity attraction perspective (McPherson, Smith-Lovin, & Cook, 2001), in which it is argued that individuals are naturally drawn to others with similar characteristics, also holds for helping. As the help network is a relatively understudied type of network, I additionally examine the structural building blocks of adolescent help networks in this chapter. That is, relationships may emerge not as a result of (similarity in) particular characteristics, but as a result of general tendencies of individuals to form relations (Veenstra, Dijkstra, Steglich, & Van Zalk, 2013; Veenstra & Steglich, 2012). For example, adolescents may prefer to help peers who have helped them (reciprocity), or prefer to help helpers-of-helpers (transitivity). Using data of 840 adolescents residing in
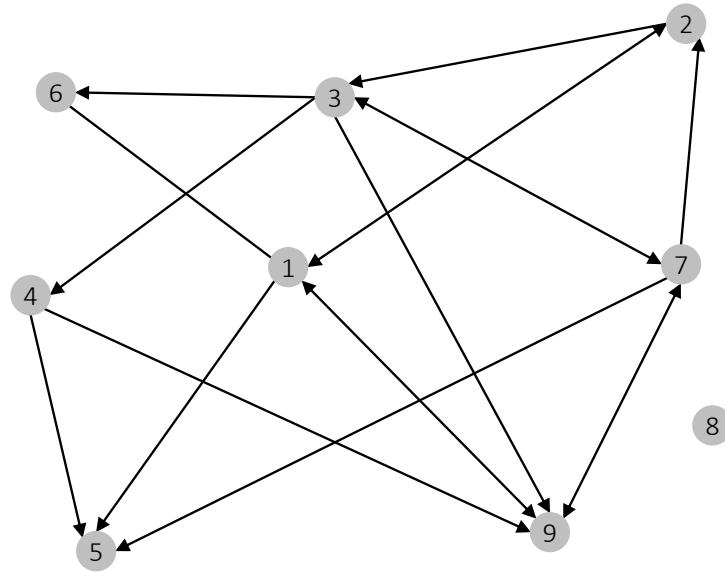
Figure 1.1
Sociogram resulting from the Table 1.2 adjacency matrix, where nodes represent individuals, and the arrows the help nominations between them

40 secondary school classrooms, this chapter provides first insights into the characteristics of help networks.

CHAPTER 3. DISENTANGLING THE INTERPLAY BETWEEN FRIENDSHIP AND HELP

Relationships are rarely characterized by one quality but often occur in multivariate forms (Pattison & Wasserman, 1999). Demonstrating this, help has found to be a distinctive feature of other positive relationships such as friendship (Furman & Buhrmester, 1992; Hartup & Stevens, 1997; Newcomb & Bagwell, 1995). Previous research primarily highlighted help as part of the definition and expectations of friendship, but I propose that the interrelatedness of friendship and help is more complex. First, associations between friendship and help are bidirectional: Not only does friendship give rise to help, help may also function as bridge to establish friendships (Wentzel & Erdley, 1993). Second, both friendships and help are directional: They can be mutually oriented (e.g. Jonathan and Lisa help each other) or one-sided (only Jonathan helps Lisa), implying that there are many configurations in which friendship and help may coincide. For example, Jonathan and Lisa regard each other as friend (mutual), but only Jonathan helps Lisa (one-sided). Third, friendship and help develop over time: They emerge and may be maintained, and each can contribute to the emergence and maintenance of the other. Using data of 41 friendship and help networks, I aim to unravel the interrelatedness of friendship and help in a more detailed way, generating new information on the role of help in friendships and vice versa, and aiding us in understanding the complexities of adolescents' social relations.
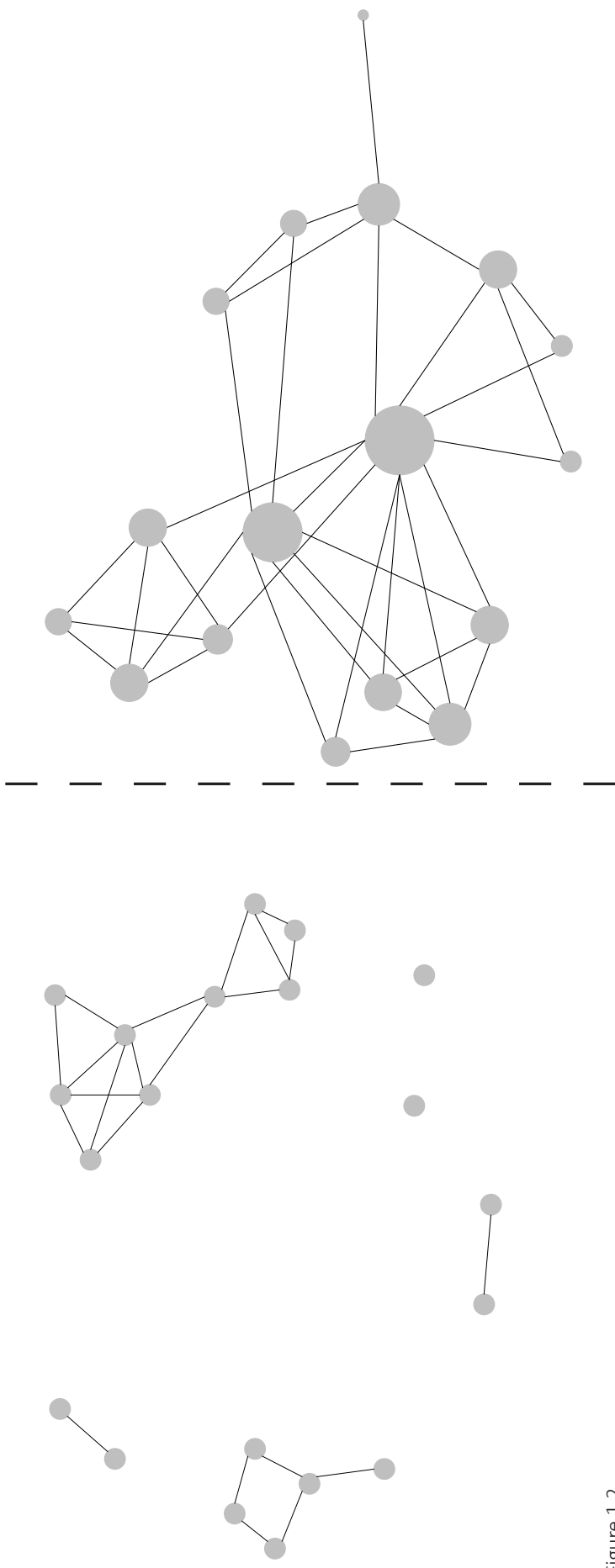
Figure 1.2
Left: A typical segmented classroom help network, in which help is concentrated in subgroups
Right: A typical centralized classroom help network, in which some individuals (i.e., the larger nodes) have more help relations than others

CHAPTER 4. CLASSROOM HELP NETWORKS, INDIVIDUAL NETWORK
POSITION, AND ACADEMIC ACHIEVEMENT

After having examined help on the individual and dyadic level, I examine group-level characteristics of help in Chapter 4. No classroom help network looks the same: While analyzing help networks, the difference in quantity of help and the spread of help over individuals immediately stand out: In some classrooms, helping each other seems more common than in other classrooms. Also, in certain classrooms, helping seems segmented, that is, concentrated in sub-groups (Figure 1.2 – left). Finally, in some classrooms, some individuals have considerable more help relations than others (Figure 1.2 – right), causing the network to center around these individuals. This 'visual' variation in classrooms motivated me to describe differences in help network characteristics between classrooms in more detail. Furthermore, in this chapter I aim to assess whether variation in the characteristics of help networks and variation in individual embeddedness in these networks have actual consequences for adolescents. Previous findings have established that adolescents' academic motivation and success are in part determined by the social climate in the classroom (Thapa, Cohen, Guffey & Higgins-D'Alessandro, 2013; Wang & Degol, 2016), of which peer support is a salient aspect (Fraser, Anderson, & Walberg, 1982). This study of 54 classroom help networks will provide more insight into what help networks look like and how they may affect adolescents' school outcomes.

CHAPTER 5. CONSEQUENCES OF RECEIVING HELP FOR DEPRESSIVE
SYMPTOMS

The structural characteristics and predictors of help networks having been delineated in previous chapters, I will examine the consequences of receiving help by looking at processes of social influence emerging from help on depressive symptoms. Whereas it may be appealing to conclude that help furthers positive outcomes, as it is meant to benefit (relations with) others, it may also lead to adverse outcomes. An exemplary study into depression socialization demonstrated that befriending depressed peers may increase one's own symptoms of depression, referred to as co-rumination (Van Zalk, Kerr, Stattin, Branje, & Meeus, 2010). This process appeared to be at play especially in *supportive* friendships (e.g., Calmes, & Roberts, 2008; Rose, Carlson, & Waller, 2007). In this chapter, I will delineate how receiving help affects the development of depressive symptoms, and propose that the effect of help depends on the level of depressive symptoms of one's helpers: Receiving help from peers who do not suffer from depressive symptoms may break depressed adolescents' spiral of negative thoughts or emotions, whereas co-rumination may take place if helpers suffer from symptoms as well. I assess the co-evolution of 73 help networks and individual depressive symptoms to assess whether help is beneficial for the receiver of help, potentially preventing emotionally unstable adolescents from cascading into more severe internalizing problems.

SNARE stands for Social Network Analysis of Risk behaviors in Early adolescence, which is a longitudinal project on the social development of (early) adolescents with a specific focus on the interaction between (early) adolescents' peer social networks and the development of behavior. Two secondary schools were asked and willing to participate: One in the middle and one in the north of the Netherlands. In the Netherlands, secondary school follows after elementary school - there is no middle school or junior high school. Students enter the first grade of secondary school at about age 12. The SNARE-study started with a pre-assessment in September 2011, assessing all first and second grade students who agreed to participate in the study (cohort 1). One year later (2012-2013) all new first grade students were again approached for participation in the study (cohort 2). In total, 1,826 students were approached for this study, of which 40 students (2.2%) refused to participate for several reasons, for example, the parent and/or adolescent had no interest, the adolescent was dyslectic, or it was too time consuming. A total of 1,786 students participated in SNARE (*M* age pre-assessment = 12.91 years, *SD* = .70, 50.1% male, 83.9% Dutch). After the pre-assessment, the SNARE study continued with 3 regular assessments (October, December, and April) per school year, and ended after 13 assessments in April 2015. At each measurement occasion, participants were asked about several aspects of their daily lives, for example, their relationship with parents, their well-being, and time spending. In addition to that, peer nominations were used to assess, amongst others, friendships, antipathies, help, and peer valued characteristics such as popularity.

SNARE proved to be a valuable source of data for this dissertation: SNARE is a large study as it contains data from multiple measurement points and from a large number of secondary school students. This allowed me to track the development of help relations and their associations with individual characteristics over time using complex models. Moreover, because SNARE followed students from the beginning of secondary school, the actual development of help relations could be studied, as students form new social networks of peer relations at the transition from elementary school to secondary school.

IN SUM

This dissertation aims at answering the following research questions. An overview of the empirical chapters is presented in Table 1.3 and Figure 1.3.

Who gives help, who receives help, and who helps whom?

How does one-sided versus mutual help influence the initiation and maintenance of friendships and vice versa?

What is the structure of and variation between classroom help networks, which positions do individuals take up in these networks, and how are classroom network structure and individual network position associated with academic achievement?

How does receiving help affect the development of depressive symptoms, and how does this depend on the level of symptoms in helpers?

Given the scarcity of research on the positive role peers may play in adolescents' lives through help, the knowledge resulting from this project addresses a significant gap in research by providing a comprehensive image of help from three different perspectives: The individual, pairs of individuals, and the classroom. Knowledge of antecedents and consequences of help is important, as positive relationships are key to help adolescents navigate the turbulent transition from childhood into adolescence, and ensure a healthy development. Hopefully, this dissertation will provide researchers with insights that encourage further inquiry into positive aspects of the peer context, and aids teachers in understanding how adolescents' positive relations with peers may be used to improve classroom atmosphere and the well-being of their students.

Table 1.3
Overview of empirical chapters

Chapter	Research question	SNARE subsample	Method	Dependent variable(s)
2	Who gives help, who receives help, and who helps whom?	Cohort 1, school 1, 40 classrooms. 840 first and second graders (M age = 13.4)	Longitudinal social network analysis	Help peer nominations
3	How does mutual versus one-sided help influence the initiation and maintenance of friendships and vice versa?	Cohort 1 and 2, school 1 and 2, 41 classrooms. 953 first graders (M age = 12.7)	Longitudinal Bayesian social network analysis	Help and friendship peer nomi-nations
4	What is the structure of and variation between classroom help networks, which positions do individuals take up in these networks, and how are these network indices associated with academic achievement?	Cohort 1 and 2, school 1, 54 classrooms. 1,144 first and second graders (M age = 13.1)	Multilevel analysis	School grades
5	How does receiving help affect the development of depressive symptoms?	Cohort 1 and 2, school 1 and 2, 73 classrooms. 1,648 first and second graders (M age = 13.1)	Longitudinal Bayesian social network analysis	Depressive symptoms

FRIENDSHIP RELATIONS

Chapter 3

HELP RELATIONS
(WHO HELPS WHOM?)

Chapter 2

Chapter 5

CLASSROOM NETWORK &
INDIVIDUAL NETWORK POSITION

Chapter 4

INDIVIDUAL

ADJUSTMENT
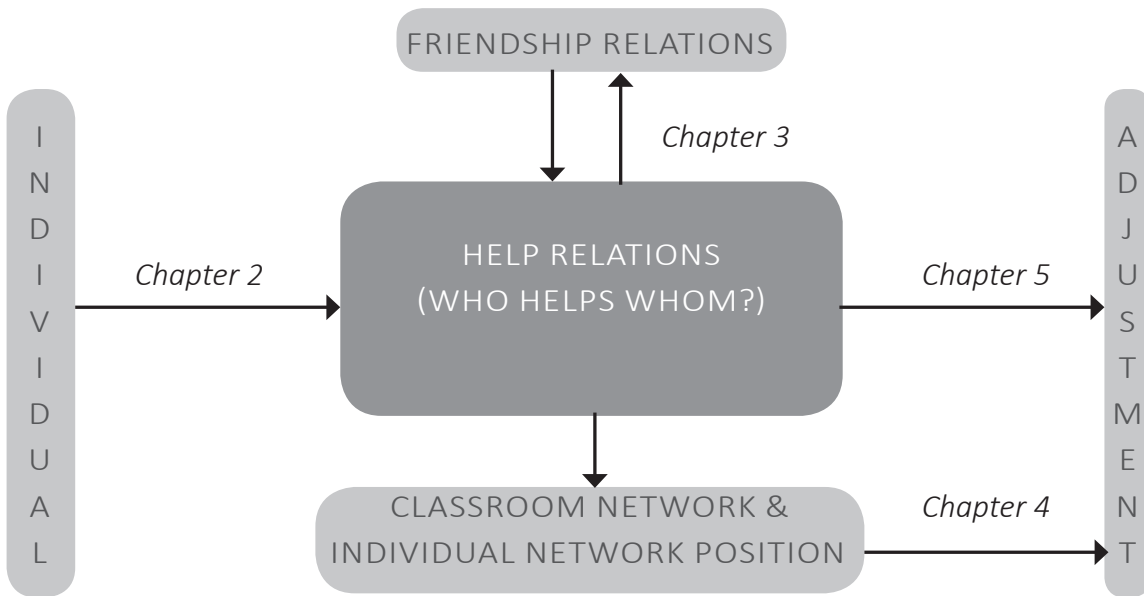
Figure 1.3
Overview of empirical chapters

Chapter 2

Who helps whom?
Investigating predictors of adolescent
help relationships

In this chapter, we investigated adolescent help relations by examining social networks based on the question '*Who helps you with problems (for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down)*'. The effects of individual characteristics (academic achievement, depressive symptoms, and peer status) on receiving help and giving help were examined, and we investigated the contribution of (dis)similarity between adolescents to the development of help relations. Sex, structural network characteristics, and friendship relations were taken into account. The findings demonstrated that (dis)similarity in sex, depressive symptoms, and peer status is an important driving factor underlying the emergence of help relations in the peer context, and that help is segregated based on these characteristics. As such, help should be defined in terms of benefitting *particular* others.

INTRODUCTION

Help falls under the definition of prosocial behavior, which has been defined as '*voluntary behaviour that benefits others or promotes harmonious relations with others*' (e.g., providing emotional or practical help) (Dovidio, Piliavin, Schroeder, & Penner, 2006; Eisenberg et al., 1999). Giving and receiving help become salient interactions already in the very early stages of life: Young children tend to respond prosocially to parental or peer distress, are willing to share objects, and comfort upset others (Eisenberg, Fabes, & Spinrad, 2006). As regards receiving help, children depend mainly on their parents, who take up a central role in the provision of practical and emotional support (Furman & Burhmester, 1992; Larson & Richards, 1991). During the transition to adolescence, however, the context in which giving and receiving help take place partly shifts from parents to peers: Adolescents seek to achieve a higher degree of autonomy from their parents (Allen & Land, 1999; Berndt, 1982), and gradually spend less time with their parents from late childhood into adolescence (Larson & Richards, 1991). Instead, they spend a substantial portion of their waking hours at school in the presence of peers, diminishing the role of parents as help providers. Indeed, although parents remain key instrumental help providers, peers become an important addition to adolescents' social support system (Del Valle, Bravo, & López, 2010; Hombrados-Mendieta, Gomez-Jacinto, Domingues-Fuentes, Garcia-Leiva, & Castro-Trave, 2012), given their familiarity with the challenges age-mates face (Furman & Burhmester, 1992) and their day-to-day contact.

This shift in context from parents to peers also influences how giving and receiving help are perceived by adolescents: Given the importance of peers in shaping adolescents' behaviors and relationships (Adler & Adler, 2003; Baumeister & Leary, 1995; Ormel, Lindenberg, Steverink, & Verbrugge, 1999), *which* peers to give help to and from *which* peers to receive help become salient questions at this age. Traditionally, research on adolescent help in the peer context has overlooked this relational nature, and mainly focused on explaining adolescent prosocial tendencies as an individual outcome (see for a review Eisenberg, Fabes, & Spinrad, 2006; some exceptions notwithstanding; Baerveldt, Van Duijn, Vermeij, & Van Hemert, 2004; Lomi, Snijders, Steglich, & Torlò, 2011). Consequently, we know to some extent who is likely to help others, but which peers profit from this help, and what characterizes these peer help relations remains largely unknown.

To shift the focus to receivers of help and help relations among peers, in this study we aimed to answer the question 'who helps whom?'. We identified adolescent help relationships with peers (i.e., peer relationships of help giving / receiving) by asking participants to nominate those peers who '*help you with problems (for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down)*'. In doing so, we aimed to examine (1) which characteristics predict receiving help; (2) which characteristics predict giving help; and (3) the extent to which (dis)similarity in characteristics between adolescents contributes to the development of help relationships. Specifically, we were

interested in the role of academic achievement, depressive symptoms, and peer status, these being indicators of problems in the adolescent school context and arguably related to the need for help. Also, we were interested in how peer rejection and popularity shape help relations, as social standing is a prominent predictor of prosocial behavior and relationship formation (Dijkstra, Cillessen, & Borch, 2013; Greener, 2000; Munch & Kinchen, 1995). Because prosocial behavior is of higher saliency in girls' than boys' peer relations (Colarossi, 2001; Rose & Rudolph, 2006), we additionally took the role of sex into account.

Finally, findings of previous studies on social relations show that relationships are not only a consequence of individuals' behaviors and characteristics, but may also emerge as the result of other processes occurring in networks, such as returning help received (reciprocity) and the tendency to form helping groups (transitivity) (Veenstra, Dijkstra, Steglich, & Van Zalk, 2013). Moreover, help relations may emerge as a consequence of friendships, given their key role in (emerging) friendships and friendship quality (Bowker et al., 2010; Bukowski, Hoza, & Boivin, 1994; Parker & Asher, 1993). The social network approach implemented in RSiena (Snijders, Van de Bunt, & Steglich, 2010) enabled us to map out adolescents' help relations with peers, allowing us to investigate how characteristics and behaviors shape help relations, while taking into account network processes and the overlap between help and friendship.

Theoretical background

In our introduction we described help as part of prosocial behavior, i.e., voluntary behavior with the intent to benefit others. Looking at motivations for prosocial behavior, this definition seems to relate closely to the concept of altruism: Behavior with the intrinsic intent to benefit others, that is, helping without expecting anything in return, such as material or social benefits (Aronson, Wilson, & Akert, 2013; Eisenberg & Mussen, 1989). Of course, helpers are –at least in part– intrinsically motivated to benefit others, but other motives have been found to play a significant role as well. For example, receivers of help may consider whether they want to receive help from certain more or less able others (Ackerman & Kenrick, 2008; Nadler, 1987; 2015), and givers may take into account the effort it takes to help (Eisenberg et al., 2006; Schroeder & Graziano, 2015; Wentzel, Filisetti, & Looney, 2007). Social goals are important motives behind giving and receiving help as well: Importantly, previous researchers maintained that adolescents' behavior can be explained in part by their wish to attain status and affection among peers (Adler & Adler, 2003; Baumeister & Leary, 1995; Ormel et al., 1999). Considering the consequences of asking for help from and giving help to particular peers, we consider help relations to be instrumental in the attainment of status and affection goals. Indeed, help is an important way in which adolescents attain social goals; the exchange of help intensifies positive relations with peers (Reid, Landesman, Treder, & Jaccard, 1989; Sullivan, Marshall & Schonert-Reichl, 2002), and givers and receivers of help may consider whether they want

to associate with peers who have a particular status (Dijkstra, Cillessen, & Borch, 2013; Dijkstra, Cillessen, Lindenberg, & Veenstra, 2010). At the same time, asking peers for help or giving help to particular peers may, as will be explained in the following, pose a threat to one's social status (Ackerman & Kenrick, 2008; Middleton & Midgley, 1997; Nadler, 2015). From this perspective, we argue that asking for and giving help may complicate the realization of status and affection goals for adolescents with certain characteristics. At the same time, these goals may sensitize help seekers and givers to specific characteristics of their peers.

WHICH ADOLESCENTS RECEIVE HELP MORE OFTEN?

Intuitively, one would expect disadvantaged individuals (here; low achievers, adolescents having depressive symptoms, or adolescents with a low peer status) to ask for help more often. These individuals are likely more in need of help and may consequently mobilize their social network to fulfill their needs. However, the mobilizing of peers might have social repercussions as it requires disclosure of vulnerabilities and shortcomings. This disclosure may not only form a substantial threat to adolescents' self-esteem (Bohns & Flynn, 2010; Fisher, Nadler, & Whitcher-Alagna, 1982; Nadler, 2015), but may also hinder their goal achievement among peers as admitting failure in the academic, emotional, or social domain may signal that one is dumb, inferior, or 'uncool' (Ackerman & Kenrick, 2008; Middleton & Midgley, 1997). In line with this reasoning, Ryan, Hicks, and Midgley (1997) found that lower achieving students perceived seeking help as a threat to their self-esteem, and tended to avoid help-seeking (see also Ryan & Shin, 2011). Moreover, Sawyer and colleagues (2012) found in their vignette study that adolescents having depressive symptoms intended to seek help from their friends less frequently. Further evidence for this mechanism comes from studies demonstrating that adolescents concerned with avoiding negative peer evaluations were more likely to not discuss or to trivialize their problems among friends (Ryan et al., 1997; Shin & Ryan, 2012) or schoolmates (Roussel, Elliot, & Feltman, 2011). To sum up, we argue that adolescents actually experiencing problems tend to avoid consulting their peers, as seeking help may compromise their peer status. Following this, we expect that

nominating others as helpers (i.e., receiving help) is associated negatively with depressive symptoms and peer rejection, and positively with academic achievement and popularity (Hypothesis 1)

WHICH ADOLESCENTS GIVE HELP MORE OFTEN?

Our second question concerns who is attractive to approach for help. Following the 'basking in reflected glory' literature, likeable and popular peers are attractive peers to approach for help (Dijkstra et al., 2010; Dijkstra et al., 2013): Associating with peers who are well-liked and popular among classmates positively affects one's own social standing in the peer group. As such, adolescents more likely seek help from high-status peers.

The same mechanism possibly holds for low achievers and adolescents with depressive symptoms. Having low achievement or symptoms of depression both predict a low social status among peers (Agoston & Rudolph, 2013; Fekkes, Pijpers, Fredriks, Vogels, & Verloove-Vankorick, 2006; Krygsman & Vaillancourt, 2017; Valås, 1999; Van der Sande, Hendrickx, Boor-Klip, & Mainhard, 2017). This may in part be explained by the relatively poor social skills of low achievers and depressed adolescents, but likely also by the image of being stupid or ill resulting from not being able to perform well in school or suffering from emotional problems. We propose that associating with peers who have a low peer status does not allow adolescents to profit from peers' status, leading them to seek help from peers who do not experience issues in the academic, emotional, or social domain.

Looking at seeking help as a means to achieve instrumental goals (e.g., gaining information or solutions for problems), we would also argue that well-adjusted peers are asked for help more often, as their help is likely more useful. Of course, higher achievers are typically approached for help with academic problems (Lomi et al., 2011), but their intelligence might also attract help-seekers who struggle with other types of difficulties, as intelligent peers may have a reputation for 'knowing things'. Adolescents suffering from depressive symptoms may in particular be less approachable for help. Not only does depression typically coincide with poorer social skills or aggressive behaviors towards peers (Agoston & Rudolph, 2013), adolescents with depression are also found to focus on their own emotions and feelings when confronted with peers' problems, which hampers effective provision of support (Carrera et al., 2013; Liew et al., 2011). Following this, we expect that

> being nominated as a helper (i.e., giving help) is associated negatively with depressive symptoms and peer rejection, and positively with academic achievement and popularity (Hypothesis 2)

WHO HELPS WHOM?

Reasoning from a status perspective, there are two competing views on the role of the combination of receiver and giver characteristics in the emergence of help relationships. On the one hand, the need for help and the preference for receiving help from a specific other suggest that particularly peers who possess complementary characteristics would help each other. That is, one would expect help relations between, for example, a low and a high academic achiever. In line with this, it has been suggested that adolescents who differ from each other tend to help each other, as admitting incompetence to peers with different characteristics and behaviors feels less threatening for one's status and self-esteem than doing so to similar peers (referred to as 'comparison stress'; Nadler, 1987; 2015): The notion that one differs from a particular peer helps justifying that one's competencies may also differ from those of peers.

The suggestion that less competent adolescents would approach more competent helpers would, however, imply that help-seekers are placed in an unfavorable

and dependent (status) position relative to their help-givers. From a goal perspective it is quite unlikely that help-seekers would manoeuver themselves into such status-costly relationships. In line with a similarity attraction approach (Byrne, 1971; McPherson, Smith-Lovin, & Cook, 2001), we propose that individuals are more likely to establish help relationships with similar others. Similarity ensures that needs are more easily understood and communication runs more smoothly. This mutual understanding decreases the likelihood of being rejected or ridiculed by the similar peer, and minimizes threats to the status position as a consequence. Exemplifying adolescents' tendency to interact with similar others, it has been demonstrated that depressed adolescents seek out other depressed peers as friends (Van Zalk, Kerr, Branje, Stattin, & Meeus, 2010) with whom they discuss their problems (Rose, 2002). Building on this latter approach, we expect that

adolescents similar in academic achievement, depressive symptoms, peer rejection, and popularity are more likely to nominate each other as helpers (Hypothesis 3)

SEX, FRIENDSHIP, AND STRUCTURAL NETWORK EFFECTS

Sex. Previous research has shown that the tendency to help others is more pronounced in girls, and that helping is more normative in girls' relationships (Bukowski et al., 1994; Colarossi, 2001; Hall, 2011; Rose & Rudolph, 2006). As such, girls mobilize their peers for help more easily than boys. Additionally, from the perspective of the help-seeker, girls may be more preferred as providers of help: They generally display higher levels of empathy than boys (Hopmeyer-Gorman, Schwarz, Nakamoto, & Mayeux, 2011; Sears, Graham, & Campbell, 2009). Looking at reciprocal help relations, however, a somewhat different picture emerges. Nelson-Le Gall and DeCooke (1987) found that academic help exchanges took place more frequently in same-sex dyads, even though girls were viewed as academically more competent. This is in line with the findings of Baerveldt and colleagues (2004), who found that helping mainly took place within same-gender relations. Given these findings, we expect that girls (are) nominate(d) more (as) helpers, and that adolescents of the same sex are more likely to nominate each other as helpers.

Friendship. Importantly, previous research has established a clear link between friendship and help, implying that giving and receiving help may result from friendship affiliation. The association between help and friendship was reflected in research suggesting that help distinguishes friends from non-friends (e.g., Bigelow, 1975; Furman, 1984; Furman & Burhmester, 1992; Newcomb & Bagwell, 1995), and that friends expect each other to help (Fehr, 2004; Hall, 2012), suggesting that help and friendship overlap. In addition, the processes leading to the emergence of these relations also show similarities. For example, the similarity attraction approach holds for the emergence of friendships as well (Veenstra & Dijkstra, 2011). Given these findings, we expect that friends are more likely to nominate each other as helpers. Because the present study was focused on the effects of (similarity in) individual characteristics over and above the effects of friendship, it was necessary to take this key covariate into account, in order to ensure

that any association found would refer to (processes leading to) help relations instead of friendships.

Structural network effects. Lastly, relationships may emerge not as a result of (similarity in) particular characteristics or friendship, but as a result of structural, endogenous network effects accounting for changes in relationships. Controlling for these effects overcomes bias in the effects of individual characteristics (Veenstra & Steglich, 2012). Building on research on friendship relations, in our analyses, we controlled for the most common network effects (Veenstra et al., 2013): That is, the general tendency to nominate peers as helpers (outdegree) and the tendency to reciprocate help nominations (reciprocity). Moreover, we accounted for group formation tendencies (transitivity and balance) and for the variation in the extent to which individuals nominate peers as helpers and receive nominations for helping (i.e., out- and indegrees). For a further explanation of these effects, we refer to the methods section and Table 2.1.

Methods

PROCEDURE

In the present study, we use data from the SNARE-project (Social Network Analysis of Risk behavior in Early adolescence; see Dijkstra et al., 2015), a study aimed at investigating the social and behavioral development of (early) adolescents. Prior to the data collection, all eligible students and their parents received an information letter, in which they were asked to participate. If students wished to refrain from participation, or if their parents disagreed with their children's participation, they were requested to send a reply card or email within ten days. We emphasized during every assessment that participation was anonymous and could be terminated at any point in time. The SNARE study has been approved by the ethics committee of one of the participating universities. During the assessments, a teacher and research assistant(s) were present. The research assistant gave a brief introduction, and the students then filled in the questionnaire on the computer during class. The assessment of the questionnaires took place during regular school hours within approximately 45 minutes. The students who were absent that day were, if possible, assessed within a month.

PARTICIPANTS

We examined the networks of all first and second grade classrooms of one participating secondary school in the north of the Netherlands (*N* classrooms = 40; *N* students = 868). For this study, we used data of the first three regular waves; October 2011, (wave 1), December 2011 (wave 2), and April 2012 (wave 3). At wave 1, students were on average 13.20 years old, 49.4% were boys, and 49.4% were Dutch. Students had, on average, a slightly lower SES than the average Dutch SES. Between waves 1 and 2, five students entered school and two students left the school; and between waves 2 and 3, nine students left school and two students entered school. They were part of the network

across all waves, but were assigned with structural zeros when they were not (yet/anymore) in school, meaning that they could not (be) nominate(d) (by) classmates. Also, at wave 2, one student's data were found to be unreliable and were deleted. Across the school year, a total of 15 students refused consent to participate in the study. All their data, including responses preceding their refusal, were deleted. This resulted in a sample of 852, 856, and 849 participants at wave 1, wave 2, and wave 3 respectively.

MEASURES

In the present study, academic achievement, depressive symptoms, peer rejection, popularity, sex, and friendship at wave 1 and 2 were used to predict changes in help relations from wave 1 to 2 and 2 to 3. Peer nominations were examined within classrooms, and participants could nominate an unlimited number of same- and cross-sex classmates on each peer nomination question.

Help relationships within classrooms at wave 1, 2, and 3 were assessed using a peer nomination procedure. Participants were asked to nominate classmates who '*help you with problems (for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down)*' (adapted from Baerveldt et al., 2004; Dijkstra, Lindenberg, Verhulst, Ormel, & Veenstra, 2009; Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011; Tremblay, Vitaro, Gagnon, Piché, & Royer, 1992). Note that the implication of this question is that giving help is represented by an incoming nomination, and receiving help by an outgoing nomination. Help networks for each classroom at all waves were represented by a directed adjacency matrix, with 0 and 1 representing absence and presence, respectively, of a nomination between individual i and j. Some participants named (almost) everyone in their classroom as helper, whereas they hardly named anyone at the preceding and/or next assessment. In addition, their nominations were hardly or not reciprocated. These extreme (out)degree outliers may have interpreted the question differently from their classmates. We recoded their outgoing nominations as missing. This was the case for 6, 6, and 8 participants on the three respective waves. Their incoming nominations were retained. Similar strategies to handle extreme outdegree outliers have been used in previous research (e.g., Light, Greenan, Rusby, Nies, & Snijders, 2013). On average, the number of helpers (outdegree) across the waves was 2.39 (SD = 2.70).

Academic achievement at wave 1 and 2 was assessed by asking participants to rate their performance on Dutch language and mathematics on a 5-point scale from *insufficient* (1) to *excellent* (5). Scores on these two items were summed to obtain the total performance for every student, resulting in an average score of 6.91 (SD = 1.43) across wave 1 and 2.

Depressive symptoms at wave 1 and 2 were assessed using three items from a self-report scale on depression (based on Kandel & Davies, 1982). The internal consistency of these three items was α = .81 for wave 1 and α = .85 for wave 2. Participants were asked how often during the preceding month s/he felt unhappy, miserable, and down; felt nervous and tense; and worried too much. The items were rated on a 5-point scale

ranging from *never* (1) to *always* (5). Scores on the items were summed and divided by three to obtain mean levels of depressive symptoms for every participant, resulting in an average score of 2.09 (*SD* = 0.87) across wave 1 and 2.

Peer rejection at wave 1 and 2 was based on the peer nomination question '*which classmates do you dislike*' (Card, 2010). A proportion score was calculated by taking the number of nominations received on peer rejection and dividing them by the number of participants in the classroom minus 1. On average, participants scored .10 (*SD* = .13) on peer rejection, meaning that participants were rejected by 10% of the classroom on average.

Popularity at wave 1 and 2 was also assessed using peer nominations. Participants nominated classmates on the questions '*which classmates are most popular*' and '*which classmates are least popular*' (LaFontana & Cillessen, 2002). Popularity was calculated by subtracting the proportion scores (i.e., the number of nominations received divided by the number of participants in the classroom minus 1) of least popular peer nominations from most popular peer nominations. On average, participants scored .03 (*SD* = .29) on popularity, meaning that students received about as many nominations for most popular as for least popular on average.

As for the control variables, sex was measured at wave 1, and was coded 0 for girls and 1 for boys. Friendships within classrooms at wave 1 and 2 were assessed using the peer nomination question '*who are your best friends*'. Friendship networks for each classroom at all time points were represented by a directed adjacency matrix, with 0 and 1, respectively, representing absence and presence of a nomination between individuals *i* and *j*. On average, the number of friends was 4.58 (*SD* = 3.19).

ANALYTICAL STRATEGY

To model the development of help relationships, we used the Simulation Investigation for Empirical Network Analyses software package in R (RSiena; Ripley, Snijders, Boda, Vörös, & Preciado, 2018), software instantiating stochastic actor-based statistical models of social network dynamics (Snijders, 1996; Snijders et al., 2010). The focus of the present study was on modeling changes in networks (i.e., help relationships) from one observation moment to the next. The model interprets the observed, compound change of help patterns as the result of a series of unobserved, smallest possible changes taking place between observation moments, where a smallest possible change is either the termination of an existing help relation between two participants, or the creation of a new one. The nature of network changes is modelled by an objective function, expressing under which conditions actors will create, maintain, or dissolve a help relation. The parameters in the model (see Model specification) express these different conditions. Estimates are obtained in an iterative Monte-Carlo procedure, alternating until convergence between the sampling of network change sequences (based on the model parameters), and the updating of model parameters (based on discrepancies between the observed data and the simulated end networks of the sampled change sequences; Snijders, 2001). Parameters are tested in

the same way as in other generalized linear models, using *t*-ratios (parameter estimate divided by its standard error).

Parameter values are interpreted as the contribution to actor's objective function. Thus, the higher the value of an effect in the objective function, the stronger the tendency to create or maintain a help nomination. A value of *b* = −0.5 for the alter effect of peer rejection means that if alter increases one unit on the scale of peer rejection, this subtracts 0.5 on ego's objective function for asking help of that particular alter. These estimates are log-odds, but we also expressed the effects as odds by taking the exponential function of the parameter estimate, and calculated their confidence interval (for calculations see Ripley et al., 2018). Odds indicate the impact of a parameter on the probability of a participant nominating a helper. Note, however, that this ceteris paribus assumption is problematic, given that network parameters correlate and co-occur, and given that ego, alter, and similarity effects are highly intertwined. Thus, odds should be interpreted with caution.

In order to increase statistical power, we combined the classrooms into four school-location networks. Because participants were not allowed to nominate helpers outside their classroom, we used the so-called structural zero coding between classrooms so that the software would not interpret these between-class non-nominations as regular non-nominations (i.e., as valid indicators that help was not received). After fitting the same model specification to all school locations' data, we aggregated the results in a meta-analysis (Snijders & Baerveldt, 2003), in which a significant chi-squared test indicated heterogeneity between location parameters. In the meta-analysis, standard errors were determined based on random effects combinations; that is, between-location differences were accounted for and the total variance was (re-)partitioned into between- and within-location randomness.

Once convergence was reached for all four school locations, we assessed the goodness of fit of our model by investigating to what degree the models could explain additional features of the help networks that were not explicitly included in the model specification, viz., activity regarding nominating helpers (outdegree distribution), popularity regarding receiving nominations for helping (indegree distribution), and subgroup structure in the help network (triad census).

Model specification. The first part of the analysis consisted of the specification of network effects. The network effects that were used in the final model and their explanations can be found in Table 2.1. While controlling for both reciprocal (i.e., mutual) and unidirectional (i.e., one-sided) nominations made in the friendship network, we included the following basic network effects: Outdegree, the general tendency to nominate others as helpers; reciprocity, the tendency to help those who help you; and group formation tendencies such as transitivity, the tendency to nominate helpers-of-helpers as your own helpers. In addition, we added degree-related effects to account for variation in degrees (the tendency to be nominated as a helper, and to nominate others as helpers, respectively). To increase the goodness of fit of our models, we added

the balance parameter a posteriori; it indicates participants' (group formation) tendency to help each other because they are being helped by the same third-party helpers. Individual-level attributes were included as so-called ego, alter, and similarity effects. The ego effect captures the effect of covariates on nominating others as helpers. The alter effect captures the effect of covariates on being nominated as a helper. The same/similarity effect captures the tendency to form help relations with others who are similar on particular covariates. In case of a significant same/similarity effect, we constructed ego-alter selection tables in order to gain more insight into the effect of the predictors on network evolution. Indeed, individuals may not vary in the degree to which they receive or give help (ego and alter effects), but they might vary in whom they mention as helpers (similarity effects). A selection table gives more insight into such findings (Ripley et al., 2018). The values in this table represent the contribution to actors' objective function if they nominate completely similar peers (diagonal values in the table) versus completely dissimilar peers as helpers (off-diagonal values in the table).

Table 2.1
Explanation of parameters in the RSiena network effects model

Effect	RSiena name	Explanation	Graphical representation	
			Wave N	*Wave N+1*
Outdegree	`density`	Tendency to nominate others as helper	i ⟶ j	i ⟶ j
Reciprocity	`recip`	Tendency to reciprocate help	i ⟶ j	i ⟷ j
Transitivity	`transTrip`	Tendency to have ties with helpers-of-helpers	i ↗ h ↘ j	i ↗ h ↘ j, i ⟶ j
Balance	`balance`	Tendency to form relations with others who have a similar set of outgoing nominations to ego	i ↗ h ↖ j	i ↗ h ↖ j, i ⟶ j
Outdegree popularity	`outPop`	Tendency of actors with high outdegrees to attract incoming nominations	i ↗ h ↘ j	→i ↗ h ↘ j
Friendship	`X`	Tendency to form relations with actors whom one nominates as friend	i ·····> j	i ⟶ j
Ego effect	`egoX`	Tendency of actors with higher values on *X* to have a higher outdegree	i	i ⟶
Alter effect	`altX`	Tendency of actors with higher values on *X* to have a higher indegree	i	⟶ i
Similarity effect	`same/simX`	Tendency of relations to occur more often between actors with the same or similar values on *X*	i j / **i j**	i ⟶ j / **i ⟶ j**

DESCRIPTIVE RESULTS

Descriptive statistics of the help networks are presented in Table 2.2. In the following section, we provide the ranges over the waves. Participants indicated that they received help from two to three classmates (outdegree). Helping was quite common, as only 11%-15% of the participants were not reported as helpers (zero indegree), and 21%-26% reported not being helped (zero outdegree). Furthermore, 15%-18% of the participants gave help only (indegree only), and 5%-6% received help only (outdegree only). The proportion of help nominations given in the classroom, based on the ratio of actual and possible relations, was about 13% (density). 45%-49% of the nominations were mutual (reciprocal). In 54-58% of the cases, helpers of helpers were nominated as one's own helper (transitivity), and 77%-90% of the help relations were formed among participants of the same sex. To be able to perform longitudinal social network analyses, a sufficient fraction of help nominations should remain stable (Jaccard index). Averaged across waves and classrooms, about 25 new nominations emerged, 25 nominations dissolved, and 27 nominations remained stable across waves. The Jaccard indices were 38% for wave 1 to wave 2, and 33% for wave 2 to wave 3. Given that a Jaccard index of above 30% is recommended (Veenstra & Steglich, 2012), the stability of the networks was sufficient. Descriptives of the other study variables at wave 1 and 2, and *t*-tests for differences between boys and girls can be found in Table 2.3.

Correlations between receiving help (outdegree) and giving help (indegree) and the study variables for boys and girls separately, of which the most consistent correlations are discussed, can be found in Table 2.4. In general, giving and receiving help were positively interrelated for both boys and girls. Furthermore, giving help was negatively related to peer rejection, and positively to popularity. Receiving help was only positively related to popularity, but not consistently. Finally, both giving and receiving help were positively related to giving and receiving friendship nominations, although more consistently and often more strongly for girls. There were no strong and consistent correlations of giving and receiving help with academic achievement and depressive symptoms. We also examined whether students that did not give or receive *any* nominations for help (zero outdegree or zero indegree, respectively) differed from those who gave or received at least one nomination (results available upon request). Consistent with the correlations, we found that those involved in giving or receiving help were less rejected, more popular, and gave and received more friendship nominations. Finally, to get an indication whether our theoretical idea that lower achievers and adolescents with depressive symptoms have a lower peer status, and are therefore not mentioned as helper, is supported by the data, we examined the correlations between peer rejection and popularity, and achievement and depressive symptoms (results available upon request). There were no indications that lower achievers or depressed youth had a lower peer status.

RSIENA ANALYSES

Results of the RSiena network analyses can be found in Table 2.5, in which mean parameter estimates b, standard errors SE, levels of significance p, odds, and their confidence intervals

Table 2.2
Descriptive statistics of the sample, help, and friendship

	Sample					
	Wave 1	*Wave 2*	*Wave 3*			
N participants	852	856	849			
N locations	4	4	4			
N classrooms	40	40	40			
M classroom size	21.27	21.43	21.35			
N students absent	10	29	33			
M age	13.20	13.37	13.70			
% Boys	49	49	49			
	Help relations			Friendship relations		
	Wave 1	*Wave 2*	*Wave 3*	*Wave 1*	*Wave 2*	*Wave 3*
M outdegree[a]	2.43	2.47	2.27	4.30	4.86	4.59
SD outdegree[a]	2.68	2.85	2.58	2.97	3.35	3.25
SD indegree[a]	1.65	1.57	1.54	2.28	2.45	2.29
% zero indegree[a]	11	11	15			
% zero outdegree[a]	21	23	26			
% indegree only	15	18	17			
% outdegree only	5	6	6			
% isolates	6	5	9			
% density[a]	13	13	12	23	26	25
% reciprocity[a]	49	45	47	66	65	65
% transitivity	58	56	54	66	66	66
% same sex[a]	77	90	89	74	75	75
N nominations	2189	2224	2047	3851	4370	4120
	Help relations[b]					
	1	*2*				
N 0- 1[a]	25	24				
N 1- 0[a]	23	28				
N 1- 1[a]	29	25				
% jaccard index	38	33				
% distance	62	68				

Note: Descriptive statistics with [a] were calculated per classroom network and subsequently divided by 40. All other statistics were calculated over the full sample. [b] 1 and 2 refer to the transitions between wave 1 and wave 2, and wave 2 and wave 3, respectively.

are presented. Results of the chi-squared tests ($\chi2$ and *p*-value) indicate heterogeneity between the four school locations. Table 2.6 presents the ego-alter selection results.

WHO RECEIVES AND GIVES HELP, AND WHO HELPS WHOM?

Academic achievement. The negative ego effect for academic achievement suggests that higher achievers received help less often (*b* = −0.17, *SE* = 0.02, *p* < .001). We found no significant alter or similarity effect (*b* = 0.01, *SE* = 0.02; *b* = 0.17, *SE* = 0.23).

Depressive symptoms. Depressive symptoms did not predict receiving help (*b* = 0.01, *SE* = 0.04), and negatively predicted giving help, but the effect size was small (*b* = −0.02, *SE* = 0.00, *p* < .001). The similarity effect was significant (*b* = 0.26, *SE* = 0.10, *p* < .01). Table 2.6 shows that adolescents less likely (receive) help (from) dissimilar peers based on depressive symptoms: Whereas the values on the diagonal (expressing a preference for similarity) were relatively small (0.08 and 0.04), the larger off-diagonal values show that high-depressed adolescents less likely received help from low-depressed peers (−0.14) and vice versa (−0.26). Thus, depressed adolescents gave help less often, and adolescents less likely received help from dissimilarly depressed peers.

Peer rejection. Peer rejection positively predicted receiving help (*b* = 1.02, *SE* = 0.42, *p* < .01), and negatively predicted giving help (*b* = −0.78, *SE* = 0.27, *p* < .001). Zooming in on these results, Table 2.6 shows that high-rejected adolescents mentioned low- and high-rejected peers as their helpers (0.28 and 0.26). However, low-rejected adolescents were unlikely to report high-rejected peers as their helpers (−1.16) (similarity effect; *b* = 0.60, *SE* = 0.17, *p* < .001). Thus, high-rejected students received help more often but gave help less often. Also, they received help from low- and high-rejected peers, but they did not give help to low-rejected peers.

Popularity. Popularity did not predict variation in receiving and giving help (*b* = 0.15, *SE* = 0.21; *b* = −0.41, *SE* = 0.25). However, the similarity effect was significant (*b* = 0.79, *SE* = 0.12, *p* < .001). Table 2.6 demonstrates that low-popular adolescents were more likely to report low-popular peers (0.29) than high-popular peers (−1.20) as helpers. High-popular adolescents did not report low- and high-popular peers as helpers (−0.25 and −0.15). Thus, low-popular peers did not receive help from dissimilarly popular peers, and high-popular adolescents did not receive help from similarly and dissimilarly popular peers.

Sex. Sex did not predict receiving help (*b* = 0.08, *SE* = 0.10), but negatively predicted giving help (*b* = −0.15, *SE* = 0.03, *p* < .001). Thus, boys were less often reported as helpers. The similarity effect was also significant (*b* = 0.50, *SE* = 0.12, *p* < .001). Table 2.6 suggests an aversion to (receiving) help (from) cross-sex peers, a tendency that was stronger for girls (−0.36) than for boys (−0.13).

Friendship. The positive friendship covariate indicates that befriended adolescents tended to help each other more often (*b* = 0.88, *SE* = 0.06, *p* <.001).

Structural network effects. The outdegree (density) parameter reflects the basic tendency to nominate helpers. It was negative and significant (*b* = −1.99, *SE* = 0.09, *p*

< .001), indicating that adolescents were highly selective in nominating classmates as helpers. The positive value of the reciprocity parameter (b = 1.72, SE = 0.09, p < .001) indicates that help relations tended to become mutual, and the positive transitive triplets effect (b = 0.45, SE = 0.08, p < .001) signifies the tendency to nominate helpers-of-helpers as one's own helper. The small negative balance parameter indicates that people tended not to help each other if they were being helped by the same third-party helpers (b = −0.08, SE = 0.02, p < .001). Lastly, the negative outdegree popularity effect (b = −0.29, SE = 0.03, p < .001) indicates that participants who received help more often tended to give help less often over time.

School location heterogeneity. According to chi-squared tests there was significant school location heterogeneity in several parameter estimates (which is common in meta-analytic network studies). However, this did not give rise to concerns about the validity of our results (results available upon request): Significant parameter estimates in the meta-analysis were generally significant in all locations, and differed in size only, not in sign (i.e., they were more pronounced in some locations). In addition, most non-significant parameter estimates in the meta-analysis were not significant across all locations or significant in only one location. However, in two school locations we found a tendency towards helping similar peers with respect to academic achievement (positive

Table 2.3
Descriptives and *t*-tests for differences between boys and girls (waves 1 and 2 for each variable)

Variable	Min- Max	*M* girls	*SE*	*M* boys	*SE*	*t*-value
Academic achievement	0- 10	6.97	1.35	6.89	1.37	0.96
		6.93	1.46	6.85	1.63	0.76
Depressive symptoms	0- 5	2.27	.84	1.94	.82	5.58**
		2.25	.91	1.92	.92	5.11**
Peer rejection[a]	0- 1	.08	.11	.09	.11	−2.21*
		.10	.13	.12	.12	−1.23
Popularity[a]	−1- +1	.01	.26	.02	.30	−0.57
		.02	.29	.05	.31	−0.57
Giving help[a]	0- 1	.16	.10	.10	.08	9.98**
		.16	.09	.10	.08	10.63**
Receiving help[a]	0- 1	.16	.14	.10	.15	5.21**
		.17	.16	.10	.15	6.52**
Being befriended[a]	0- 1	.23	.13	.22	.12	0.47
		.26	.14	.25	.14	0.82
Befriending[a]	0- 1	.23	.15	.23	.17	−0.03
		.26	.16	.27	.20	−0.73

Note: Descriptives of variables with [a] are based on proportion scores (i.e., indegree/outdegree divided by number of classmates minus 1). Average indegrees and outdegrees are identical by definition (up to non-response, that is), but their standard deviations are not, which makes their separate testing meaningful.
* p < .05; ** p < .01.

Table 2.4

Correlations among giving help (indegree help) and receiving help (outdegree help) with the study variables, and sex differences

Variable name	W	Giving help						Receiving help					
		Girls W1	Boys W1	Z-score	Girls W2	Boys W2	Z-score	Girls W1	Boys W1	Z-score	Girls W2	Boys W2	Z-score
Giving help[a]	1				.50***	.49***		.27***	.13**	2.10*	.12*	.28***	-2.40*
	2	.50***	.49***					.22***			.17**	.25***	
Receiving help[a]	1	.27***	.13*	2.10*	.22***						.39***	.20***	3.00**
	2	.12*	.28**	-2.40*	.17**	.25***		.39***	.20***	3.00**			
Academic achievement[a]	1												
	2				.12*								
Depressive symptoms[a]	1							-.10*					
	2	-.15**			-.11*						.12*		
Peer rejection[a]	1	-.24***	-.22***		-.33***	-.22***							
	2	-.24***	-.27***		-.40***	-.27***	2.11*						
Popularity[a]	1	.40***	.38***		.37***	.25***		.22***			.11*	.17*	
	2	.39***	.39***		.39***	.30***		.22***				.20***	
Being befriended[a]	1	.62***	.47***	3.08**	.55***	.47***	2.25*	.24***	.11*	3.49***	.13*	.26***	
	2	.56***	.42***	2.66***	.65***	.55***		.23***		3.19***	.16**	.28***	
Befriending[a]	1	.19***	.23***		.24***	.17**		.41***	.19***		.27***	.17*	
	2	.22***	.13**		.32***	.16**	2.44*	.41***	.21***		.41***	.26***	2.43*

Note: Non-significant correlations (in absolute value, all below .097) are left out of the table for clarity. Significant sex differences for significant correlations are indicated with Z-score and p-value. Variables with [a] are proportion scores (i.e., indegree/outdegree divided by number of classmates minus 1). * p < .05; ** p < .01; *** p < .001.

similarity effect). Moreover, in one school location, depressed adolescents were found to receive help more often, whereas in another school location, they were found to receive help less often. Generally, though, we could not distinguish a clear pattern in this heterogeneity; that is, there was no location that consistently showed stronger effects or a greater number of significant effects.

Table 2.5
RSiena estimates of selection effects in help networks, and differences across school locations

	b	SE	odds	lower	upper	estimate	χ2 (sign.) (df = 3)
Structural network effects							
Outdegree	−1.99***	0.09		0.12	0.16	0.18	18.27***
Reciprocity	1.72***	0.09		4.65	6.72	0.19	4.23
Transitivity	0.45***	0.08		1.35	1.83	0.15	36.66***
Balance	−0.08***	0.02		0.86	0.97	0.05	54.18***
Outdegree popularity	−0.29***	0.03		0.70	0.80	0.07	9.53*
Friendship	0.88***	0.06		2.13	2.74	0.13	11.83**
Ego effects: Which adolescents receive help more often?							
Sex (boy = 1)	0.08	0.10	1.09	0.90	1.32	0.19	15.24**
Academic achievement	−0.17***	0.02	0.84	0.82	0.87	0.03	5.59
Depressive symptoms	0.01	0.04	1.01	0.93	1.09	0.08	13.05**
Peer rejection	1.02**	0.42	2.77	1.21	6.32	0.84	13.25**
Popularity	0.15	0.21	1.16	0.77	1.74	0.41	6.64
Alter effects: Which adolescents give help more often?							
Sex (boy = 1)	−0.15***	0.03	0.86	0.81	0.91	0.06	1.63
Academic achievement	0.01	0.02	1.01	0.98	1.05	0.04	6.07
Depressive symptoms	−0.02***	0.00	0.98	0.97	0.98	0.01	0.07
Peer rejection	−0.78***	0.27	0.46	0.27	0.77	0.53	6.95
Popularity	−0.41	0.25	0.67	0.41	1.09	0.50	8.37*
Similarity effects: Which adolescents help each other more often?							
Sex	0.50***	0.12	1.65	1.30	2.08	0.24	42.73***
Academic achievement	0.17	0.23	1.02	0.97	1.07	0.46	13.98**
Depressive symptoms	0.26**	0.10	1.07	1.02	1.12	0.21	4.12
Peer rejection	0.60***	0.17	1.81	1.31	2.51	0.33	4.62
Popularity	0.79***	0.12	2.21	1.75	2.79	0.24	1.75

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; 95% CI(odds) = exp(ln(OR) ± (1.96 * SE (ln(OR)))

Table 2.6
Selection table for help networks showing strength of attraction for each variable separately, based on depressive symptoms, peer rejection, and popularity (low – high), and sex (girl – boy)

Variable	Value ego	Value alter	
		Low	High
Depressive symptoms	Low	0.08	−0.26
	High	−0.14	0.04
Peer rejection	Low	0.07	−1.16
	High	0.28	0.26
Popularity	Low	0.29	−1.20
	High	−0.25	−0.15
Sex	Girl	0.29	−0.36
	Boy	−0.13	0.22

Note: Values are derived from Table 2.5. Calculations based on Ripley et al., 2018

DISCUSSION

The present study is, to our knowledge, the first in which adolescent help relations with peers were examined using a longitudinal social network framework to shed light on the relational instead of individual aspects of help. The findings demonstrate that this framework is suitable for investigating help in the peer context (i.e., the help networks were stable enough to analyze, and the results across school locations were fairly constant); and meaningful: We showed that giving and receiving help were steered partly by a preference for (not) forming help relations with (dis)similar others, and by tendencies to form relations with others as a result of general preferences for relationship formation.

WHO RECEIVES HELP, WHO GIVES HELP, AND WHO HELPS WHOM?

From the perspective that adolescents are driven by status and affection goals (Adler & Adler, 2003; Baumeister & Leary, 1995; Ormel et al., 1999), it was expected that especially well-adjusted adolescents (here: higher academic achievers, adolescents having a lower level of depressive symptoms, and higher status adolescents) would be involved in receiving and giving help more often, and that adolescents would tend to (receive) help (from) similar others. Although concurrent associations between giving and receiving help and peer rejection, popularity, and friendship suggested that givers and receivers were higher in peer status, longitudinal associations, which will be discussed now, were less straightforward.

Who receives and gives help? The hypothesis with respect to receiving help was not supported. Longitudinal analyses showed that sex, depressive symptoms, and popularity were unrelated to receiving help. Also, contrary to the expectations and this general trend, it was found that lower achievers and peer-rejected adolescents received help more often. Although these result were unexpected, low achievement and being

rejected by peers may reflect a need for help. As such, these adolescents may mobilize their peers for social support. Lower achievers may not be hampered by status concerns to ask peers for help, as having a lower achievement may signal indifference or nonchalance regarding teachers' expectations, which might be labelled as cool (Cillessen & Van den Berg, 2012; Schwartz, Gorman, Nakamoto, & McKay, 2006). In fact, academic achievement was unrelated to peer status amongst our participants. Additionally, some researchers suggest that rejection may stimulate adolescents to (re-)establish relationships with peers (Maner, DeWall, Baumeister, & Schaller, 2007). Thus, socially excluded adolescents may actively seek to reconnect with their peers by asking them for help (see Erdley & Asher, 1999; Hawley, Little, & Pasupathi, 2002; Wentzel & Erdley, 1993).

Our hypothesis about giving help was partly supported. Generally, we expected that help of maladjusted adolescents would be less useful, and that associating with these adolescents would compromise one's peer status. In line with the expectations, adolescents having depressive symptoms and peer-rejected adolescents gave help less often. Academic achievement and popularity were, however, not related to giving help. We thus found differences in associations between the two peer status measures: Perhaps, the desirability to associate with popular peers may be less universal than for (not) associating with rejected peers: For some adolescents, associating with popular peers may be intimidating and may trigger feelings of inferiority. This notion might have mitigated the expected positive association of popularity with giving help.

Generally, it was challenging to provide a coherent image of typical givers and receivers of help based on the characteristics taken into account in this study. Although it can be explained why each separate characteristic is unrelated to giving or receiving help or related to help in an unexpected way, it is challenging to provide a convincing empirical or theoretical image of givers and receivers of help. This result, as well as a reflection on our proposed underlying mechanism, will be further discussed in the limitations section.

Who helps whom? In line with our hypothesis, it was found that adolescents preferred to (receive) help (from) others who were similar on depressive symptoms, peer rejection, popularity, and sex. This result seemed to be largely driven by an aversion to receiving help from dissimilar peers, a tendency reflected by Rosenbaum's (1986) dissimilarity-repulsion hypothesis, stating that instead of similarity being the driving force of relationship formation (McPherson et al., 2001), it is mainly dissimilarity that prevents individuals from establishing (help) relations (*cf.* Laursen et al., 2010). This aversion towards helping dissimilar others seemed to be stronger for some than for others. For example, girls more strongly disliked to receive help from boys than boys did from girls. Moreover, the similarity effect for peer rejection was likely driven by the strong aversion of low-rejected students to mention high-rejected peers as helper – high-rejected students mentioned classmates low and high in rejection as helpers. Furthermore, we found that low-popular students preferred to be helped by peers similar in status, but that high-popular students tended to avoid peers with a low and high status. These latter two findings suggest that high-status adolescents tend to be more protective of their status:

They less likely affiliate with low-status others or peers who may threaten one's status position. It might also mean that a 'default selection' process is taking place, implying that low-status peers do not prefer to help similar others, but that their high-status peers refuse affiliation, and are therefore not available (see Deptula & Cohen, 2004). The finding that rejected adolescents mentioned helpers who were low- and high-rejected additionally aligns with the proposed idea that rejected adolescents try to connect with (any) other peer in order to (re)gain acceptance.

In conclusion, adolescents seem to be selective regarding whom they (receive) help (from), with (dis)similarity functioning as selection criterion. Generally speaking, the preference for similarity resulted in a segregated help network in which well-adjusted and maladjusted adolescents were hardly connected to each other through help. Importantly, these results suggest that prosocial behavior should be defined in terms of benefitting (relationships with) *particular* others (see Kuhlmeier, Dunfield, & O'Neill, 2014; Martin & Olson, 2015; Nadler, 2015). That is, prosocial behavior is likely more exclusive than some conceptualizations suggest.

NETWORK CHARACTERISTICS

In addition to individual characteristics that predict help relations, we were interested in the general pattern describing help networks. The results demonstrated that help networks partly reproduce the behavior of other types of positive networks. Similar to friendship and likeability networks, help relations were reciprocal and clustered in groups (Huitsing et al., 2012; Sentse, Kiuru, Veenstra, & Salmivalli, 2014; Veenstra et al., 2013). However, these tendencies were less pronounced in help networks (Huitsing et al., 2012; Veenstra et al., 2013); we found that adolescents who received help more often gave help less often over time, suggesting an inclination counter to reciprocity. Also, adolescents did not receive help from peers who were helped by the same helpers, indicating a less pronounced tendency to form help groups. Thus, there are differences in the preconditions leading to friendship and liking on the one hand, and help on the other hand. A possible explanation for this discrepancy is that reciprocity and group formation in liking or friendship networks may occur when peers positively evaluate each other, whereas reciprocity and group formation tendencies in help networks may additionally depend on needs, or the ability to meet others' needs, and may thus be more atypical of help networks. To conclude, the help networks in this study showed characteristics typical of networks, but also some distinct features. In our view, it is worthwhile to further investigate these networks.

LIMITATIONS, STRENGTHS, AND FUTURE RESEARCH

In interpreting the results, it is prudent to bear in mind the limitations of the method we chose to assess the giving and receiving of help. Importantly, given the general nature of the question, it was not known what kind of help was exchanged. Specific instances of help would probably have related more clearly to specific individual characteristics;

help with homework would have shown stronger associations with givers' and receivers' academic achievement, and emotional help with their depressive symptoms. Essentially, our results suggest that general help relates less to specific skills or characteristics, but more to general predictors of relationship formation, such as network tendencies, similarity, and social standing. Second, use of more specific measurements would allow examination of whether different forms of help show distinct relational (network) patterns. For example, whereas (seeking) emotional help is likely to be limited to a few trustworthy peers, practical help may face less strict boundaries (Baerveldt et al., 2004). This may have consequences for the way in which networks are structured, such as their density and the extent to which peers cluster in help groups. The benefit of this broad measure of help however, was that the presence or absence of nominations for giving or receiving help was likely less dependent on the need for help or the ability to provide help.

A second issue pertains to the testability of our theorized underlying mechanism. We argued that status and affection concerns partly influence who helps whom and that, therefore, individuals with particular characteristics were not involved in giving or receiving help. First, it is important to emphasize that status and affection are two different concepts, referring to popularity and acceptance, respectively (Parkhurst & Hopmeyer, 1998). Consequently, they may relate differently to giving and receiving help. For example, help may increase peer acceptance (Erdley & Asher, 1999; Maner et al., 2007; Wentzel & Erdley, 1993) but help only does not necessarily increase popularity, unless it is combined with dominant behaviors (Dijkstra et al., 2009; LaFontana & Cillessen, 2002). Similarly, asking for help may increase peer acceptance, but may decrease popularity as it signals incompetence and dependency (Ackerman & Kenrick, 2008; Middleton & Midgley, 1997). Furthermore, the notion that concerns about social status functions as mechanism explaining giving and receiving help was only partially supported; peer status was moderately related to giving or receiving help, but characteristics believed to reflect a low peer status (low achievement, higher levels of depressive symptoms) were actually not related to peer status in our sample. Thus, the exact role of peer status in the explanations of help relations is not entirely clear, and likely modest. As such, more research is needed to examine the interaction of different forms of social status with individual characteristics in the prediction of help relations; in this way, we may gain more insight into the social barriers and facilitators to giving and receiving help.

Lastly, we asked participants to name their helpers, but it is unclear how participants interpreted this question: Do receivers of help ask their helpers more often, or do helpers decide to help? Conceivably, this problem does not distort the structure of networks, but it complicates research into why people give or receive help, as this could depend on the skills or willingness of helpers, or on the courage and initiative of help-seekers. As a first step towards exploring this question in a network context, future network researchers may examine whether perceptions of givers and receivers about their help relation align (*cf.* Oldenburg et al., 2015).

Given these limitations, what does this help peer nomination question measure?

First, we presumably measured longstanding help relations: We found that 30% to 40% of the receivers mentioned the same helper across a time span of three months, which means that the stability of help relations falls within the range of stability found in friendships (25 to 60%; Veenstra et al., 2013). Thus, the question presumably measures '*whom do you generally turn to for help with problems*'. Given that it may measure a longer standing, relatively stable relationship, the potential of future research will be in focusing on the influence of (characteristics of) adolescents' help relations on behaviors or well-being, or the influence of characteristics of different contexts on their development.

Second, the general pattern of associations was consistent across the school locations included in our meta-analysis, indicating that the interpretation of the question was similar across contexts. Nonetheless, we found heterogeneity in the strength of associations. Although this is typical for network studies (DeLay, Laursen, Kiuru, Salmela-Aro, & Nurmi, 2013; Light et al., 2013; Ojanen, Sijtsema, & Rambaran, 2013), our findings underline the importance of including contextual factors to explain the emergence and development of peer (help) relations (Carlo, Fabes, Laible, & Kupanoff, 1999; Harris, 1995). An example has been set by Wölfer and colleagues (2012), who highlighted the role of embeddedness in affective networks for the development of empathy. Others suggested that classroom norms may impact the degree to which help is given and sought (Chang, 2004; Ryan, Gheen, & Midgley, 1998; Wentzel, Battle, Russell, & Looney, 2010). These findings inspire to further explore the role of wider network features and contextual norms in the emergence of peer help relations.

Not only should broader network features and classroom characteristics be taken into account in explaining help, the peer help context should also be integrated in adolescents' wider social support system. Importantly, although peers are salient helpers at this age, peers do not substitute but complement parental and teacher support (Levitt et al., 2005; Van Beest & Baerveldt, 1999; Wentzel, 1998; Wentzel et al., 2010). Surely, although peers are familiar with the problems age-mates face, they do not have as much life experience as parents or teachers, and may provide less accurate or suitable advice than adults. Moreover, social problems (e.g., being rejected or bullied) may be discussed with adults, as it might be too embarrassing to discuss these problems with peers, or the availability of supportive peers might be lacking. These notions encourage a deeper inquiry into the role peers, parents, and teachers fulfill in helping adolescents to deal with their problems.

Relatedly, age likely influences the organization of help relations. The increasing dependency on the help of peers from childhood into adolescence implies that the peer help network becomes larger, and its actors more interconnected. More research is needed to better capture changes in help networks over time, taking into account the role of the multitude of contexts in which help takes place, distinguishing the types of help that are provided, and taking into account age-related differences in network structure and predictors.

CONCLUDING REMARKS

In spite of its limitations, the present study has moved forward in conceiving of help as inherently relational, and has shown that it is fruitful to do so. Thus, care should be taken when giving and receiving help are considered in isolation from the network context in which this takes place, especially since our relational approach has underlined that help is exclusive (i.e., directed towards *particular* others). The findings of this study indicate that adolescents less likely (receive) help (from) dissimilar peers, emphasizing (dis)similarity as an important driving factor underlying the emergence and development of help relations in the peer context.

Chapter 3

Disentangling the interplay between friendships and help relationships

The aim of this study was to unravel the interrelatedness of friendship and help, and to examine the characteristics of friendship and help networks. We examined effects of mutual relations versus one-sided relations in the help network on friendship initiation and maintenance, and vice versa. We analyzed 41 classroom friendship and help networks (N = 953; M age = 12.7). Results illustrated that friendship and help networks show some similarities, but only partly overlap and have distinct characteristics. Longitudinal multiplex social network analyses showed that mutual help was important for the maintenance of friendship, but not for the initiation of friendship, and that particularly mutual friendships provide a context in which help takes place. Implications of these findings are discussed.

INTRODUCTION

Early adolescence is characterized by a myriad of challenges, including biological maturation, changing relationships with parents and peers, and increased educational demands. In dealing with these daily hassles, adolescents do not only rely on their own problem-solving capacities but also seek help from others. Starting in early adolescence, peers take up a central role in adolescents' network of helpers (Del Valle, Bravo, & López, 2010; Hombrados-Mendieta, Gomez-Jacinto, Domingues-Fuentes, Garcia-Leiva, & Castro-Trave, 2012).

Particularly friends are considered as targets and sources of help: Research probing children and early adolescents to describe friends versus non-friends established that helping is distinctive of friendship (Furman & Bierman, 1984; Furman & Burhmester, 1992; Newcomb & Bagwell, 1995). In fact, helping is part of the bundle of expectations tied in with friendship (Fehr, 2004; Hall, 2012). Importantly, as friends experience similar challenges and care about each other's well-being (Buhrmester & Prager, 1995), adolescents can tell friends about their challenges without fear of being ridiculed. As such, friendship is a salient context in which helping takes place.

Research on friendship and help primarily highlighted help as part of the definition and expectations of friendship. However, this picture is likely incomplete. The interrelatedness of friendship and help is quite complex: First, the associations between friendship and help are bi-directional: Not only does friendship give rise to help, help may also function as bridge to establish friendships (Wentzel & Erdley, 1993). Second, both friendships and help are directional: That is, they can be mutual or one-sided, implying that there are many configurations in which friendship and help may coincide. For example, two individuals might regard each other as friend (mutual), but only one of them might help the other (one-sided). Third, friendship and help change over time: They emerge and may be maintained, and each can contribute to the emergence and maintenance of the other. In addition, by regarding of help as inherent to friendship, previous research largely overlooked the notion that help and friendship are distinct types of social interactions, each with distinct dynamics.

This study aims to unravel the interrelatedness of friendship and help, and to examine the characteristics of friendship networks and help networks by adopting a longitudinal social network approach. We asked participants from the Dutch SNARE study (*N* = 953, *M* age = 12.7, 50.5% boys) at three time points across one school year to nominate their best friends as well as who helps them with problems. These nominations were used to assess whether and how friendship and help networks differ in structure and dynamics. Longitudinal multiplex social network analyses implemented in RSiena (Snijders, van de Bunt, & Steglich, 2010) were used to examine effects of the help network on the friendship network and vice versa, covering bi-directionality, directionality, and initiation and maintenance of friendship and help.

Several theories have been developed that focus on social relationships, mutuality, and their effects on the initiation and maintenance of these relationships. Theories of social exchange (Homans, 1958; Laursen & Hartup, 2002) and reciprocity (Gouldner, 1960) assert that relationships with others are worthwhile to initiate or maintain if the exchange of resources in a relationship (e.g., affection, help, or material benefits) is mutual, or balanced. Supporting this view, empirical research in adults showed that unbalanced exchange in social relationships may lead to feelings of exploitation and anger in the giver of resources (Walster, Berscheid, & Walster, 1973), discomfort or embarrassment in the receiver (Ackerman & Kenrick, 2008; Uehara, 1995), and feelings of loneliness in both parties (Buunk & Prins, 1998).

The cognitive developmental models by Damon (1977) and Youniss (1980) contend that this appreciation of mutuality in social relationships exists already in childhood. For example, seven-year-old children expressed awareness of a norm of reciprocity when presented with hypothetical helping situations involving their peers, exemplified by a participant explaining that '*I helped her, so she should help me*' (DeCooke, 1992; pp. 954). Also, young children are found to strive for an equal allocation of resources in their social relationships: If Jonathan plays with Lisa's toy, Lisa is allowed to play with Jonathan's toy (McGillicuddy-De Lisi, Watkins, & Vinchur, 1994; Piaget, 1965; Sigelman & Waitzman, 1991; Youniss, 1994). However, adolescents develop a more sophisticated understanding of (their role in) relations, including friendships (Berndt, 1982; Hartup & Stevens, 1997; Sullivan, 1953). They are not only focused on the benefits they may themselves gain from friendships, but are also oriented towards the well-being of the friend. As such, adolescent friends are less inclined to keep track of each other's contributions to a relationship, but respond to each other's needs when necessary (Berndt, 1982; DeCooke, 1997; Frederickson & Simmonds, 2008; Kienbaum & Wilkening, 2009; Sigelman & Waitzman, 1991).

HELP AND FRIENDSHIP MAINTENANCE

Taking a slightly different stance, however, is a strand of research focusing on expectations regarding friendship and friendship quality. The way in which adolescents define friendships and their expectations regarding friendships suggest that mutual help is important for the maintenance of friendships, and inherent to the definition of friendship. 'Symmetrical reciprocity', referring to genuine mutual acceptance and mutual regard, has been identified as one of the most salient expectations regarding friendships (Hall, 2012; Hartup & Stevens, 1997). This mutual orientation produces the intimacy and closeness that distinguishes friends from non-friends: Friends wish to know more of each other's private thoughts and feelings, and contribute to each other's happiness and well-being (Berndt, 1982; Hall, 2012; Hartup & Stevens, 1997). Via the mutual exchange of help, intimacy and mutuality –two central friendship goals, can be met. Importantly, a

precondition for help is the presence of self-disclosure, referring to disclosure of personal information, such as feelings, needs, or problems (Buhrmester & Prager, 1995; Derlega & Grzelak, 1979). As friends are explicitly invited to get involved in intimate matters, self-disclosure interconnects the daily lives of friends and contributes to friendship intimacy (Fehr, 2004; Hays, 1984). Helpers, in turn, also self-disclose by revealing their opinion on intimate matters and by sharing how they dealt with issues themselves, and help expresses genuine concern for other's issues. In contrast, employing avoidant strategies in response to friends' problems, such as avoiding a friend after (s)he experienced a stressor (Glick & Rose, 2011; Rose & Asher, 2004); labeling problems as insignificant (Clark, MacGeorge, & Robinson, 2008); or turning away the focus of the conversation towards oneself (Afifi, Afifi, Merrill, Denes, & Davis, 2013; Schwarz-Mette & Rose, 2016) have all been related to lower appraisals of friendship and lower friendship quality. Research demonstrating the positive role of help in friendship showed that the perception of having a supportive friend is associated with higher friendship quality and longer enduring friendships (Bukowski, Hoza, & Boivin, 1994; Cillessen, Lu Jiang, West, & Laszkowski, 2005; Hiatt, Laursen, Mooney, & Rubin, 2015) and greater friendship satisfaction (Parker & Asher, 1993). Whereas these studies did not focus on mutual help explicitly, we argue that friendships may less likely dissolve the more satisfied both adolescents in a friendship are with their friendship and the more interconnected friends' lives are. Given that mutual help meets adolescents' desire for friendship intimacy and mutual regard

we expect that mutual help more strongly contributes to friendship maintenance than one-sided help (Hypothesis 1)

HELP AND FRIENDSHIP INITIATION

Help may not only enhance commitment to existing friendships, but may also function as bridge to establish friendships through the signals it sends and the benefits it produces. Indeed, helping others signals potential for a rewarding relationship, as the helper presents attractive features (e.g., skills, knowledge) that others may access by becoming friends. Help also communicates affection, as the helper spends time and effort to the receivers' benefit. Moreover, asking for help implies a willingness to self-disclose to peers, which communicates trust and a desire for closeness. These signals and benefits are likely precedents of friendships: The provision of social support is associated with the formation of new friendships (Bowker et al., 2010) and peer acceptance (Dijkstra, Lindenberg, & Veenstra, 2007; Pakaslahti, Karjalainen, & Keltikangas-Järvinen, 2002), and has been described by early adolescents as an appropriate strategy for making new friends (Wentzel & Erdley, 1993).

Expectations for mutual help may, however, be modest within friendships that are at a developing stage. Non-friends or recent friends are typically less close and affectionate towards each other, and spend less time together relative to individuals in existing friendships (Bukowski et al., 1994). Moreover, sharing intimate information

and supporting each other are less salient interactions for non-friends or recent friends (Altman & Taylor, 1973; Fehr, 2004). As such, they may less likely expect themselves and the other to engage in mutual help. Primarily as the relationship progresses towards one in which individuals become more intimate and oriented towards each other's well-being, mutual exchange of help gains importance. Following this

> we expect that help increases the likelihood for friendship initiation (Hypothesis 2)

We do not distinguish between the condition of one-sided help and mutual help here, as we do not expect an additional contribution of mutual help to the initiation of friendship.

FRIENDSHIP AS CONTEXT FOR HELP

In the following, we will delineate how friendship functions as a context for help, and influences help-seeking and giving. Research into predictors of help-seeking is scarce, but identified some important social barriers and facilitators to seeking help. For example, stigma and embarrassment serve as important barriers to seeking professional help for mental problems (Gulliver, Griffiths, & Christensen, 2010; Sheffield, Fiorenza, & Sofronoff, 2004). Similarly, the fear of being rejected or ridiculed by peers hampers adolescent help-seeking in the classroom (e.g., Newman & Schwager, 1993; Ryan, Pintrich, & Midgley, 2001). Serving as facilitators to help-seeking are the trustworthiness and approachability of professional or informal sources of help (Gulliver et al., 2010; Rickwood & Braithwaite, 1994; Rickwood, Deane, Wilson, & Ciarrochi, 2005). These findings imply that friendships are a favorable context in which adolescent help-seeking could take place: Friends likely take the barriers of embarrassment and fear of rejection away, and are typically approachable and trustworthy peers: Indeed, friends care about each other's well-being (Hartup, 1996) and will therefore likely not reject each other for self-disclosing potentially embarrassing problems, or pass information on to other peers. Typical friendship characteristics such as security and intimacy (Bukowski et al., 1994; Hartup, 1996; Newcomb & Bagwell, 1995) create an environment in which help can be relatively easily and harmlessly asked for, without fear of social repercussions.

Not only seeking help, but also giving help is arguably more common for friends than for acquainted peers: Helping takes time and effort, but the affection felt for friends, as opposed to acquainted peers, may lower perceived costs of helping (McGuire, 2003): Helping with homework or listening to problems may seem less time-consuming or wearing when it is done for the benefit of a friend. Indeed, friendships have been found to function as contexts that promote support, while lowering the tendency to deny problems or to talk about something distracting (Glick & Rose, 2011). Taken together, we expect that

> friendship increases the likelihood of help (Hypothesis 3)

As the facilitators to seek help and the motivation to give help are likely more prominent in close, mutual friendships, we also expect that

mutual friendship more strongly contributes to help than one-sided friendship (Hypothesis 4)

PRESENT STUDY

The aim of this study is to examine how mutual versus one-sided help contributes to friendship, and vice versa, and to examine differences in the structure and dynamics of the friendship and help network. In short, we expect that mutual help contributes more strongly to friendship than one-sided help, and that help contributes to the initiation of friendship. We also expected friendship, in particular mutual friendship, to function as context in which help takes place.

Methods

PROCEDURE

Data were drawn from SNARE (Social Network Analysis of Risk behavior in Early adolescence), a study aimed at investigating the social and behavioral development of (early) adolescents. Two large regional secondary schools were approached, one in the North and one in the middle of the Netherlands. All first and second grade students of these schools were approached for participation in the study in school year 2011-2012. After one year, all new first grade students were approached for participation, resulting in two participating cohorts. Students completed three questionnaires per school year up until school year 2014-2015. Prior to the data collection, all eligible students and their parents received an information letter in which they were asked to participate. If students wished to refrain from participation, or if their parents disagreed with their children's participation, they were requested to send a reply card or email within ten days. We emphasized during every assessment that participation was anonymous and could be terminated at any point in time. SNARE has been approved by the ethics committee of one of the participating universities. During the assessments, a teacher and research assistant(s) were present. After a brief introduction, participants filled in the questionnaire on the computer during class. The assessment of the questionnaires took place during regular school hours within approximately 45 minutes. The students who were absent that day were, if possible, assessed within a month.

PARTICIPANTS

We examined the friendship and help networks of all first grade classrooms as assessed in October, December, and April of school year 2011-2012 (hereafter referred to as wave 1, wave 2, and wave 3, respectively). The study sample contained 41 classrooms and 953 students at wave 1 (*M* classroom size = 23.2, *M* age = 12.7, 50.5% boys, 84.5% Dutch).

We chose to assess first grade students only, as students form many new peer relations at the transition from elementary school to secondary school. As such, we were better able to study relationship initiation. During the assessment in October, December, and April, 34, 60, and 56 participants were absent, respectively. Their outgoing nominations were therefore missing, which was handled using the 'last observation carry forward' method (Huisman & Steglich, 2008). Furthermore, some students named (almost) everyone in their classroom as helper or friend, whereas they hardly named anyone at the preceding and/or next assessment. Also, their nominations were hardly or not reciprocated. These extreme (out)degree outliers may have interpreted the question differently from their classmates. We recoded their outgoing nominations as missing. This was the case for 1, 13, and 8 participants at the three respective waves. Their incoming nominations were retained. Similar strategies to handle extreme outdegree outliers have been used in previous research (Light, Greenan, Rusby, Nies, & Snijders, 2013).

MEASURES

Friendships and help networks were assessed using a peer nomination procedure. Participants could nominate an unlimited number of same- or cross-sex classmates on a large set of peer nomination questions. To assess friendship and help, we used the questions '*who are your best friends*' and '*who helps you with problems (for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down)?*', respectively. Sex was included as control variable and coded as 0 (girls) and 1 (boys).

ANALYTICAL STRATEGY

Descriptive analyses. To describe friendship and help networks and their differences, we calculated the most basic network statistics; outdegree, density, reciprocity, transitivity, sex homophily, and the stability of nominations over waves (see also Model specification). To describe the overlap of friendship and help, we additionally indicated how often each possible configuration between friendship and help nominations was present in our data (e.g., the combination of mutual friendship and one-sided help). Subsequently, we examined whether the configuration resulted in no friendship, one-sided friendship, or mutual friendship or no help, one-sided help, or mutual help at the next wave.

     RSiena. To analyze the co-evolution of friendships and help, we used the Simulation Investigation for Empirical Network Analyses software package in R (RSienaTest version 1.2.5; Ripley, Snijders, Boda, Vörös, & Preciado, 2018); software instantiating stochastic actor-based statistical models of social network dynamics (Snijders, 2001; Snijders, Van de Bunt, & Steglich, 2010; Snijders, Lomi, & Torló, 2013). The model interprets the observed, compound change of friendship and help patterns as the result of a series of unobserved, smallest possible changes taking place between observation moments, where a smallest possible change is either the termination of an existing relation between two participants, or the creation of a new one. The probability of network changes is modelled by an objective function, expressing under which conditions participants initiate, maintain,

or dissolve a relation. The parameters in the model (see Model specification) express these different conditions. Estimates are obtained in an iterative Monte-Carlo procedure, alternating until convergence between the sampling of network change sequences (based on the model parameters), and the updating of model parameters is reached.

To achieve high statistical power while sufficiently accounting for between-classroom heterogeneity, a Bayesian random effects model was estimated (Ripley et al., 2018). Parameters corresponding to hypotheses were assumed to be constant across classrooms in order to gain power (the null hypothesis is that they are 0, and therefore constant), whereas control variables were allowed to vary randomly between classrooms. Bayesian inference assigns a prior probability distribution to the parameters which is updated to a posterior probability in the light of new data. The posterior probability density is proportional to the product of the prior density and the likelihood of the data. Computations are made by Markov Chain Monte Carlo algorithms (Koskinen & Snijders 2007; 2018; Ripley et al., 2018).

For randomly varying and fixed parameters, Table 3.4 presents the estimated mean m and η, respectively, and across-classroom standard deviation sd. For each parameter, we give the estimated posterior probability p that the parameter is greater than 0. The parameter estimates we present are log-odds, but we also expressed some of the effects as odds by taking the exponential function of the parameter estimate. Odds indicate the impact of an effect on the probability of a participant nominating a helper or friend, all else being equal. Note, however, that this ceteris paribus assumption is strong, given that parameters correlate and co-occur. Therefore, the odds should be interpreted with caution.

Model specification: Rate parameters and structural effects. In the stochastic actor-oriented model, parameters can be either rate parameters or parameters in the objective function. Rate parameters refer to the rate of change in network relations between time points of observations. The objective function determines the probabilities of tie creation and tie maintenance. For hypotheses on the effects of friendship on help, parameters for creation of new ties and maintenance of existing ties are equal, and are called evaluation parameters; for hypotheses on the effect of help on friendship they are distinguished, and called creation parameters and maintenance parameters, respectively. For both networks, we included the most basic structural effects for network dynamics in the objective function: Outdegree (the general tendency to nominate others as helper or friend), reciprocity (the tendency to help or befriend the ones who help or befriend you), transitivity (the tendency to nominate helpers-of-helpers or friends-of-friends as your own helper or friend), outdegree activity (the tendency of actors with already high tendencies to nominate others as helper or friend to send extra nominations), and indegree popularity (referring to actors with already high tendency to attract nominations as helper or friend to attract extra incoming nominations). Also, we controlled for the tendency to send friendship or help nominations to classmates of the same sex (same sex effect).

Model specification: Multiplex network parameters. Effects of relations in one network on relations in the other network are expressed by multiplex network parameters (Snijders et al., 2013; see Table 3.1 for all included effects). The first set of parameters models the effects of help on friendship, where ego (*i*) may nominate alter (*j*) as a friend. To test our hypotheses regarding friendship initiation and maintenance, we distinguished between the creation of new relations and the maintenance of already existing relations using the creation and maintenance functions (Ripley et al., 2018). This results in 4 parameters modeling the effects of help on friendship: Parameters 1 and 2 model the effect of help versus no help on friendship initiation and maintenance, respectively, and parameters 3 and 4 model the effect of mutual help versus one-sided help on friendship initiation and maintenance, respectively. The second set of parameters models the effects of friendship on help, where ego (*i*) may nominate alter (*j*) as helper. Because we had no specific expectations regarding initiation or maintenance of help relations, we tested the following effects using only the evaluation function. Parameter 5 models the effect of one-sided friendship versus no friendship on help, and parameter 6 models the effect of mutual versus one-sided friendship on help. For comprehension, we also included in the results the contribution of a mutual nomination versus no nomination

Table 3.1
Graphical representation of multiplex network effects included in the model, including parameter number. The solid and dashed lines represent help and friendship nominations, respectively

Parameter	Explanation	Graphical representation	
		Time 1	Time 2
1	Effect of help on friendship initiation	i ⟶ j	i ┄┄⟩ j
2	Effect of help on friendship maintenance	i ⟶ / ┄┄⟩ j	i ┄┄⟩ j
3	Effect of mutual help on friendship initiation	i ⟷ j	i ┄┄⟩ j
4	Effect of mutual help on friendship maintenance	i ⟷ / ┄┄⟩ j	i ┄┄⟩ j
5	Effect of friendship on help	i ┄┄⟩ j	i ⟶ j
6	Effect of mutual friendship on help	i ⟨┄⟩ j	i ⟶ j

on the dependent network. Given that the model includes parameters for one-sided and mutual nominations in the 'independent' network on the dependent network, the effect of a mutual nomination as compared to no nomination is represented by the sum of these two parameters, as is demonstrated in the appendix of this chapter. We tested this sum using `multipleBayesTest` in RSienaTest (Ripley et al., 2018). On a final note, initially, our sample contained 51 classrooms. However, the rate parameters of ten classrooms were very large. As a result, the model could not reach convergence. Therefore, they were excluded from the analyses.

RESULTS

DESCRIPTIVE RESULTS

Table 3.2 presents descriptive statistics of the friendship and help networks. Figures 3.1 and 3.2 present sociograms of the friendship and the help network, respectively, of one classroom at wave 2, in which nodes represent students and arrows the friendship and help nominations between them. This is a typical classroom in the sense that it reflects the average friendship and help network statistics as presented in Table 3.2, and gives a visual impression of the differences between friendship and help networks. Furthermore, to gain insight into differences between the friendship and help network within classrooms, Figure 3.3 presents a scatterplot in which the association between friendship network density and help network density is depicted. Each node represents a classroom. Additionally, the colors represent high (light grey) medium (dark grey) and low (black) help network reciprocity, and the shape represents high (diamond) medium (triangle) and low (circle) friend network reciprocity.

Table 3.2 shows that participants mentioned about 5 friends and 2 to 3 helpers, and the density of the friendship and help network (i.e., the number of actual nominations relative to the number of possible nominations) was about 25% and 12%, respectively. About 65% of the friendships and about 45% of help nominations were mutual. About 61 to 65% of the friendships and about 50% of the help nominations were transitive (i.e., clustered in triads of individuals). About 85% of the friendships and help nominations were same-sex. Finally, the stability over waves was about 50% for friendship and about 35-40% for help (Jaccard index). Thus, friendship networks were on average twice as dense as help networks, suggesting that there are pairs of individuals who are friends, but not helpers. Relatedly, individuals more often regard each other as friend, but not necessarily mutually help each other. Both friendship and help networks tend to cluster in groups, and are similar with regard to their sex segregation and stability.

Figure 3.3 demonstrates that there is hardly any association between the densities of the two networks; if many students are friends in a classroom, this does not imply that many students in this classroom help each other, and vice versa. Additionally, there is no clear association between the reciprocity rates of the two networks; low friendship reciprocation is no indication of low help reciprocation. Finally, classrooms vary

with respect to these four dimensions; there are hardly any classrooms that have the same color, shape, and position. Thus, also within classrooms, the friendship and help network do not necessarily overlap.

Network interplay. Table 3.3a and 3.3b on pages 68 and 69 present friendship and help configurations and the frequency with which these configurations result in no friendship, one-sided friendship, or mutual friendship (or no help, one-sided help, or mutual help) at the next wave. Table 3.3a and 3.3b cover the transition from wave 1 to 2, and from wave 2 to 3, respectively. Looking at the frequencies in the third column of both tables, it can be seen that classmates usually either reported just being friends or a combination of friendship and help. Classmates rarely mutually helped each other when they were not friends at all, but one-sided help among non-friends or one-sided friends occurred quite often. Interestingly, within mutual friendships, one-sided help was more common than mutual help, particularly at wave 2.

Table 3.2
Sample description and descriptive statistics of the friendship and helping networks

	Sample					
	Wave 1	Wave 2	Wave 3			
Sample size	953	956	960			
M class size	23.24	23.32	32.41			
M age	12.66	12.82	13.16			
% boys	50.48	50.53	50.73			
	Friendship			Help		
	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
N ties[a]	5113	5577	5454	2663	2751	2627
Outdegree[b]	5.14	5.34	5.37	2.45	2.59	2.52
SD outdegree[b]	3.60	3.70	3.49	2.74	2.95	2.80
SD indegree[b]	2.63	2.69	2.54	1.64	1.69	1.75
% density[b]	24.8	26.0	26.0	11.8	12.1	11.9
% reciprocity[b]	63.0	62.4	64.8	45.7	44.2	43.9
% transitivity[b]	61.6	64.2	64.6	51.1	49.8	50.2
% same-sex[b]	83.2	85.1	86.0	83.0	86.4	85.0
	Changes in nominations across waves[c]					
	1	2		1	2	
N 0- 1[b]	42	37		28	27	
N 1- 0[b]	35	39		24	30	
N 1- 1[b]	85	85		34	32	
% jaccard index	52.2	52.7		39.1	35.8	
% distance	47.8	47.3		60.9	64.2	

Note. [a] summed over classrooms [b] averaged over classrooms [c] 1 and 2 refer to the transitions between wave 1 and wave 2, and wave 2 and wave 3, respectively.
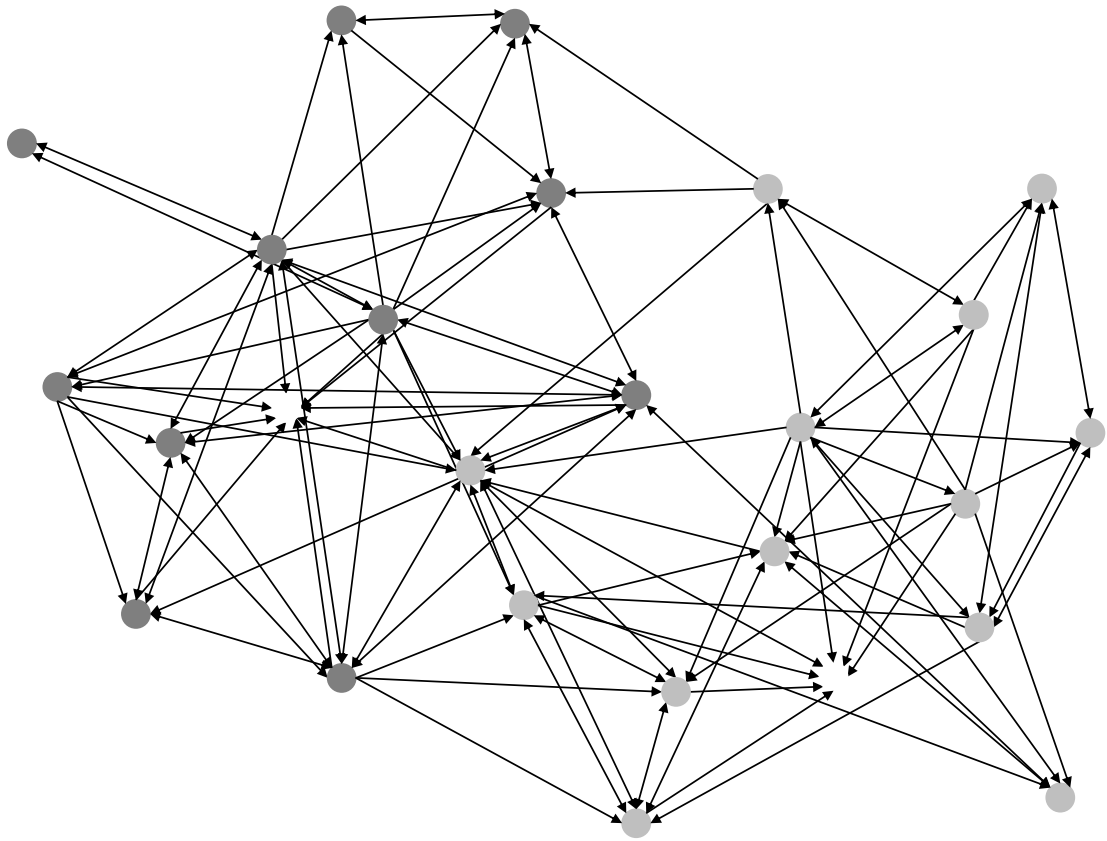
Figure 3.1
Friendship network of one classroom at wave 2
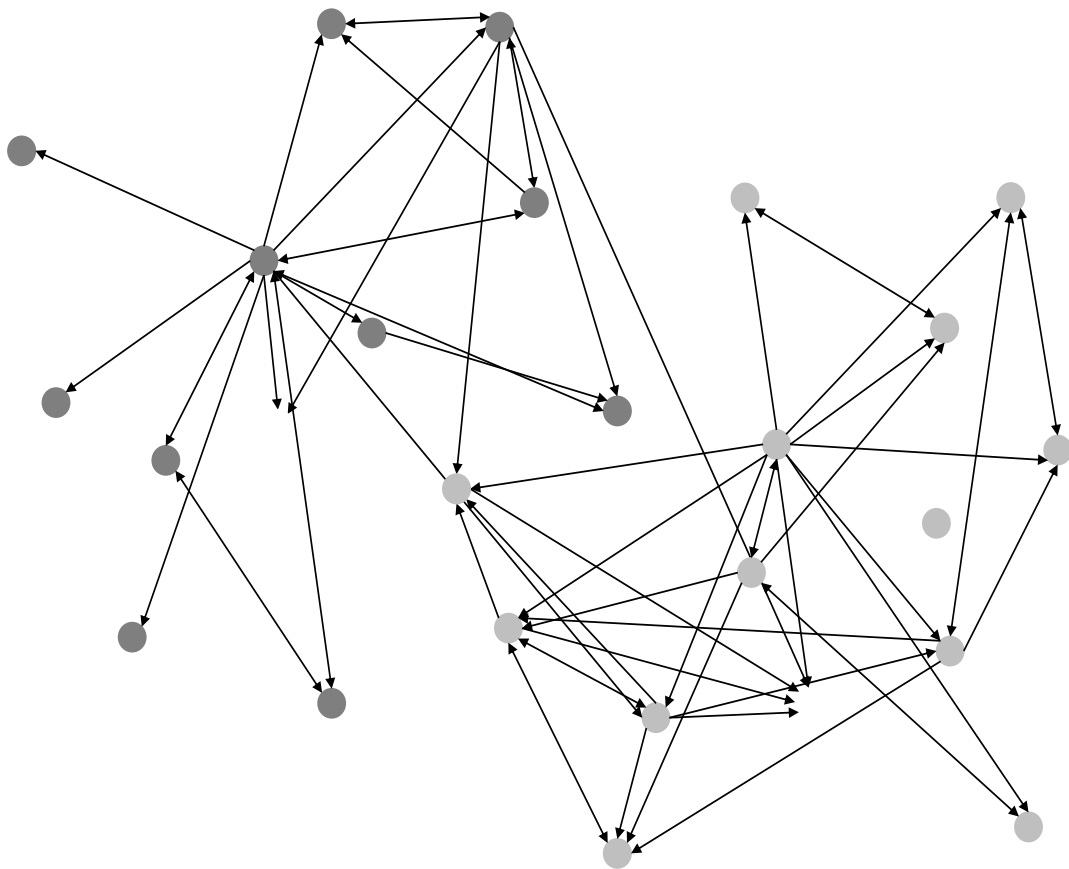

Figure 3.2
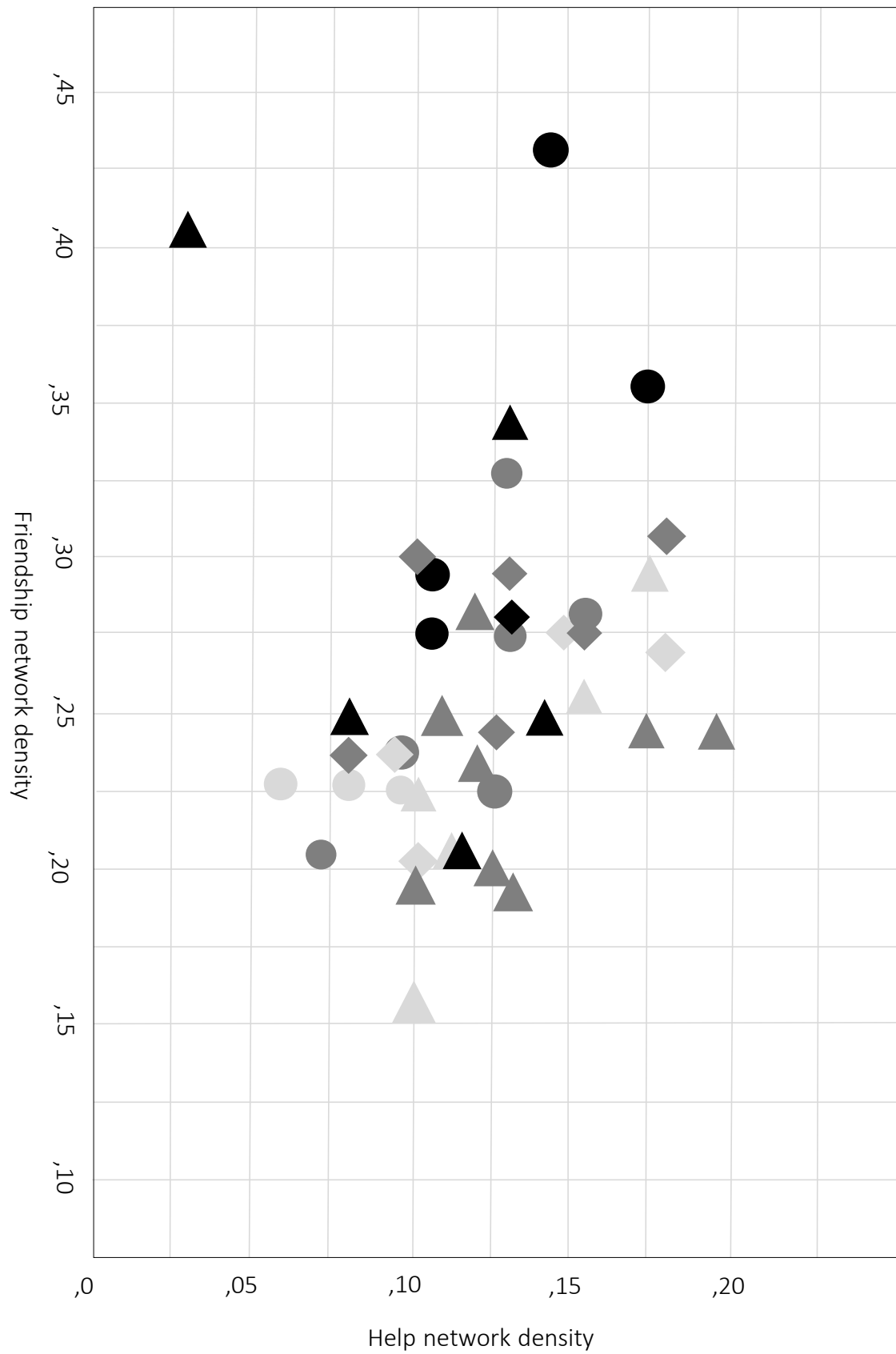Help network of the same classroom at wave 2

Figure 3.3

Scatterplot of the association between help network density and friendship network density. Each node represents a classroom. Colors represent high (light grey) medium (dark grey) and low (black) help network reciprocity, and the shape represents high (diamond) medium (triangle) and low (circle) friend network reciprocity

Friendship initiation. Looking at instances where there was no friendship (only one-sided or mutual help), there was also no friendship at the next wave in 60-70% (one-sided help) and 40-50% (mutual help) of the cases. Particularly one-sided friendships emerged from one-sided help (about 30%) or mutual help (about 40%). Rarely did mutual friendships arise from help only (6-10%, exception at wave 3; 20%).

Friendship maintenance. Friendships were more frequent in cases where there already was some form of friendship before. Additionally, one-sided and mutual friendships were more frequently maintained if the help at the preceding wave was mutual versus one-sided.

Help. In cases where there was no help (only one-sided or mutual friendship), there was usually also no help at the next wave in about 80% (one-sided friendship) and 70% (mutual friendship) of the cases. Help was more often maintained in mutual friendships rather than one-sided friendships.

In sum. Befriending classmates was more common than engaging in mutual help. One-sided help, however, was quite common, also among non-friends or one-sided friends. Second, friendships emerged from help only, but these friendships were primarily one-sided. Third, friendships are more frequently maintained if help is mutual versus one-sided. Finally, help rarely emerged from friendship relations only, but more frequently from mutual friendships than from one-sided friendships.

RSIENA RESULTS

Structural network effects. Results with respect to the structural network effects are presented in the top half (friendship) and bottom half (help) of Table 3.4. Friendship and help showed similar structural dynamics: Students tended to be selective in whom they nominate as friend and helper, as shown by the negative outdegree parameters (m = −2.23, sd = 0.17, $p < .01$; m = −3.31, sd = 0.18, $p < .01$). Both friendship (m = 0.18, sd = 0.17, p = .86; m = 0.95, sd = 0.16, $p > .99$) and help (m = 0.30, sd = 0.13, p = .98) showed tendencies toward reciprocation, and tended to cluster in groups, as shown by the posterior probabilities for transitivity (m = 0.24, sd = 0.11, p = .99; m = 0.28, sd = 0.11, $p > .99$). Finally, students tended to nominate same-sex classmates as friend (m = 0.74, sd = 0.14, $p > .99$) and helper (m = 0.46, sd = 0.14, $p > .99$).

Multiplex network parameters. Results regarding multiplex network effects are presented in the top half (friendship) and bottom half (help) of Table 3.4. Our first hypothesis stated that mutual help more strongly contributes to friendship maintenance than one-sided help. Results show that friendships were more likely maintained under the condition of one-sided help than under no help at all (parameter 2; m = 0.92, sd = 0.14, $p > .99$), and under the condition of mutual help versus no help at all (parameter 2+4; m = 2.05, sd = 0.18, p = > .99). In line with our first hypothesis, there was a positive effect of mutual versus one-sided help on friendship maintenance (parameter 4; m = 1.14, sd = 0.22, p = > .99).

Table 3.3a.

Descriptive overlap of the friendship and help network, presenting the number of mutual and one-sided help (friendship) nominations at wave 1, and how many of these nominations result in a mutual or one-sided friendship (help) nomination at wave 2

Configuration wave 1		Configuration wave 2			
	N	% No friendship[1]	% One-sided friendship[2]	% Mutual friendship[3]	Missing
No help nor friendship	14402	87.6	10.0	2.5	666
Only one-sided help	478	61.9	28.3	9.7	26
One-sided help and one-sided friendship	1004	24.7	48.8	26.4	66
One-sided help and mutual friendship	1090	7.7	24.7	67.6	78
Only mutual help	28	50.0	42.0	8.0	4
Mutual help and one-sided friendship	118	16.4	34.5	49.1	8
Mutual help and mutual friendship	964	3.3	15.1	81.6	50
	N	% No help[1]	% One-sided help[2]	% Mutual help[3]	Missing
No friendship nor help	14402	95.0	4.5	0.0	540
Only one-sided friendship	2522	79.6	17.6	2.8	100
One-sided friendship and one-sided help	1004	45.0	45.0	10.0	66
One-sided friendship and mutual help	118	22.4	34.5	43.1	2
Only mutual friendship	1016	66.9	25.5	5.6	52
Mutual friendship and one-sided help	1090	35.3	41.7	23.0	64
Mutual friendship and mutual help	964	12.1	30.4	57.4	24

Table 3.3b

Descriptive overlap of the friendship and help network, presenting the number of mutual and one-sided help (friendship) nominations at wave 2, and how many of these nominations result in a mutual or one-sided friendship (help) nomination at wave 3

Configuration wave 2	Configuration wave 3				
	N	% No friendship[1]	% One-sided friendship[2]	% Mutual friendship[3]	Missing
No help nor friendship	13842	89.4	8.1	2.5	920
Only one-sided help	500	69.0	25.0	6.0	36
One-sided help and one-sided friendship	988	30.2	45.1	24.6	44
One-sided help and mutual friendship	1234	12.2	22.2	65.6	70
Only mutual help	22	40.0	40.0	20.0	12
Mutual help and one-sided friendship	126	19.0	54.0	27.0	0
Mutual help and mutual friendship	982	7.7	14.9	77.4	42
	N	% No help[1]	% One-sided help[2]	% Mutual help[3]	Missing
No friendship nor help	13842	94.6	4.8	0.7	873
Only one-sided friendship	2694	84.6	12.5	2.8	158
One-sided friendship and one-sided help	988	56.3	34.4	9.3	40
One-sided friendship and mutual help	126	30.2	39.7	30.2	0
Only mutual friendship	948	69.7	24.4	5.9	64
Mutual friendship and one-sided help	1234	37.4	42.4	20.3	64
Mutual friendship and mutual help	982	16.1	35.1	47.9	50

Table 3.4

RSiena results on the effects of help on friendship and vice versa (N classrooms = 41; N students = 953). The table presents posterior means and standard deviations for the random parameters m and fixed parameters η, the odds (calculated by taking the exponential of the parameter), and the estimated posterior probability p that the parameter is greater than 0.

	Random effects			Fixed effects			
	m	sd(m)	p	η	sd(η)	odds	p
Effects modeling the friendship network							
Outdegree	−2.23	0.17	<.01				
Reciprocity initiation	0.18	0.17	.86				
Reciprocity maintenance	0.95	0.16	>.99				
Transitive triads	0.24	0.11	.99				
Indegree popularity	−0.01	0.11	.45				
Outdegree activity	−0.01	0.11	.47				
Same sex	0.74	0.14	>.99				
1| Effect of help on friendship initiation				1.26	0.18	3.53	>.99
2| Effect of help on friendship maintenance				0.92	0.14	2.51	>.99
3| Effect of mutual help on friendship initiation				−1.87	0.52	0.15	<.01
4| Effect of mutual help on friendship maintenance				1.14	0.22	3.13	>.99
Effects modeling the help network							
Outdegree	−3.31	0.18	<.01				
Reciprocity	0.30	0.13	.98				
Transitive triads	0.28	0.11	>.99				
Indegree popularity	−0.03	0.10	.40				
Outdegree activity	0.06	0.10	.72				
Same sex	0.46	0.14	>.99				
5| Effect of friendship				1.24	0.09	3.46	>.99
6| Effect of mutual friendship				0.92	0.07	2.51	>.99

Our second hypothesis stated that one-sided help increases the likelihood for friendship initiation. In line with this hypothesis, the likelihood of friendship increased under the condition of one-sided help versus no help at all (parameter 1; m = 1.26, sd = 0.18, p > .99). Additionally, mutual help did not contribute to friendship initiation as compared to no help (parameter 1+3; m = −0.62, sd = 0.51, p = .88). Furthermore, and surprisingly, there was a negative effect of mutual help versus one-sided help on friendship initiation (parameter 3; m = −1.87, sd = 0.52, p < .01). Note, however, that pairs of students that only had a mutual help relation were very exceptional. Therefore, this finding should be interpreted with caution.

Our third hypothesis stated that friendship increases the likelihood of helping. We also expected a stronger contribution to help of mutual versus one-sided friendship (Hypothesis 4). In line with our expectations, there was a positive effect of one-sided versus no friendship on help (parameter 5; m = 1.24, sd = 0.09, p > .99), and a positive effect of mutual versus no friendship on help (parameter 5+6; m = 2.15, sd = 0.08, p > .99). In addition, there was a positive effect of mutual versus one-sided friendship on help (parameter 6; m = 0.92, sd = 0.07, p > .99). These findings were consistent with our third and fourth hypothesis.

DISCUSSION

This study aimed to unravel the complex interplay between friendship and help among adolescents. We examined how help contributes to the initiation and maintenance of friendship, and vice versa. We expected mutual help to more strongly contribute to the maintenance of friendship than one-sided help, and expected help to contribute to friendship initiation. Finally, we expected help to result from friendship, particularly from mutual friendship.

HELP AND FRIENDSHIP MAINTENANCE

A primary aim of this research was to examine how mutual versus one-sided help would contribute to friendship maintenance. On the one hand, it has been argued that mutual exchange in relations, or 'book-keeping' of contributions to the relationship, likely does not occur in adolescence, as adolescents tend to orient towards the needs and well-being of others in social relationships instead of focusing on personal benefits (see Berndt, 1982; Hartup & Stevens, 1997; Sullivan, 1953). On the other hand, 'symmetrical reciprocity', referring to mutual acceptance and mutual regard, has been identified as one of the most important features distinguishing friends from non-friends (Hall, 2012; Hartup & Stevens, 1997). Following the latter strand of research, we argued that the mutual exchange of help is an essential way in which the desire for symmetrical reciprocity can be met, and that, as such, friendships are more likely maintained under the condition of mutual versus one-sided help.

In line with our expectation and this latter strand of research, we found that

mutual versus one-sided help contributed to the maintenance of friendship. Contrary to the need-orientation perspective, these results suggest that adolescents do not only orient on their friends' needs and well-being, but also feel that their friends should play a role in fulfilling their personal needs. As such, adolescents may be especially stimulated to maintain friendships in which mutual help takes place.

Our findings are also in contrast with a body of literature distinguishing so-called communal relations from exchange relations (Clark, Boothby, Clark-Polner, & Reis, 2014; Clark & Mills, 1979). Here it is argued that mutuality is valued within exchange relations, such as business relations or acquaintances: Individuals exchange help because they expect to receive help or have received help. This is not the case within communal relations, such as friendships or family relations, as individuals are primarily concerned with each other's well-being, and are willing to exchange help regardless of the help that has been or will be exchanged. Contrasting the need-orientation literature and the communal versus exchange literature with the approach we followed, the difference may be that the first two approaches view help primarily as a short term, instrumental interaction. In contrast, we consider help as a longer standing social interaction. Perhaps, mutual help is not important for friendship maintenance if help is seen as a one-time, functional exchange, but is important if help is seen as an ongoing social interaction contributing to friendship intimacy and mutual regard.

Another explanation for the beneficial effects of mutual versus one-sided help on friendship maintenance is that adolescents seek egalitarian relations with their peers. Indeed, adolescents seek independence from 'authority figures' such as parents or teachers (Allen & Land, 1999). In these relations, adolescents typically take up a subordinate position: Adolescents are ought to comply to parents' or teachers' wishes, and often depend on their knowledge. Therefore, in their peer relations, adolescents may want to ensure that they are not in this subordinate, dependent position. If adolescents are being helped by friends but are themselves not in the position to help, this would resemble a non-egalitarian relationship in which the focal adolescent depends on his or her friends, but not vice versa. Mutual help, however, would make friendships more egalitarian, and would make adolescents feel more comfortable with the relationship. As such, egalitarian friendships, in which help is mutually exchanged, may be maintained longer.

Although mutual help was more strongly related to friendship maintenance than one-sided help, we nevertheless found that adolescents tend to maintain friendships also under the condition of one-sided help. Although this finding is not unexpected, we argued that mutuality and thus mutual help is key for maintaining friendships. It might be possible that mutuality takes different forms (Rubin, Fredstrom, & Bowker, 2008). That is, the giving of help may not be reciprocated with help, but with material or immaterial signs of appreciation, which may also motivate the giver to maintain a friendship. The positive signals that help and receiving help send to peers, and that we expected to play a role in the initiation of friendship, may also play a role in the maintenance of friendships.

Future network studies on friendship initiation and maintenance may consider to include these 'alternative' reciprocations.

HELP AND FRIENDSHIP INITIATION

Our second hypothesis concerned the role of help in the initiation of friendship. In short, we expected one-sided help to contribute to friendship initiation, as helping others signals potential for a rewarding relationship and affection, and as asking for help communicates trust and a desire for closeness. In line with this expectation, we found that one-sided help indeed contributed to friendship initiation. However, we also found mutual help to negatively contribute to friendship initiation. Whereas we theorized that expectations for mutual help would likely be modest for non-friends, we did not expect mutual help to hamper adolescents to form friendships. Note, however, that there were only about 20 pairs of individuals that mutually helped each other without reporting a friendship, and that this finding thus relates to a very exceptional situation. Perhaps, the exceptionality of this situation and the finding that mutual help may possibly hamper friendship initiation suggests that it might be more normative for adolescents to become friends before engaging in mutual help. Becoming friends is a gradual, phased process, in which two peers first like and get to know each other before they feel affection and discuss intimate matters (Buhrmester, Furman, Wittenberg, & Reis, 1988; Hays, 1984; Newcomb & Bagwell, 1995). Engagement in mutual (negative) problem talk without feeling the affection typically felt for friends may distance two adolescents from each other. Mutual help may additionally demonstrate that both adolescents are not very resourceful, and that they may therefore not form a successful friendship pair. Possibly, one-sided help corresponds better to the notion that friendships progress from relatively superficial relationships to more intimate ones.

FRIENDSHIP AS CONTEXT FOR HELP

In addition to the contribution of help to friendship initiation and maintenance, we studied the influence of friendship on help. We expected friendships, in particular mutual friendships, to function as a context encouraging the exchange of help. Our findings were consistent with our expectation: Friendships contributed to help, and this tendency was stronger in mutual versus one-sided friendship. This result replicates previous findings on friendship characteristics (e.g., Bukowski et al., 1994; Hiatt et al., 2015), and illustrates how the intimacy within mutual friendship contributes to the willingness to help and the courage to ask for help.

However, descriptive results indicated that there were many students who identified certain classmates as helpers, but not as friends. Thus, remarkably, there was exchange of help between students whose relation was not necessarily marked by high levels of intimacy. In this study, we did not further identify the characteristics of these pairs of students. Also, research into typical help-givers in the school context is scarce. Taking into account previous studies on helping, it might be that students ask non-friends

for help if these helpers have a positive peer reputation or are similar in some respect (see Van Rijsewijk, Dijkstra, Steglich, Pattiselanno, & Veenstra, 2016); the perceived trustworthiness of others may increase if classmates generally deem this person likeable or if this person has similar characterstics (Singh et al., 2015). Future studies might further examine what makes non-friends attractive as helpers, and what gives early adolescents the courage to ask for help from non-friends.

NETWORK SIMILARITIES AND DIFFERENCES

The second aim of this study was to examine the characteristics of friendship and help networks. Help is often studied as characteristic of friendship, and not much is known about how these types of networks differ. From the longitudinal analyses, it appeared that friendship and help networks show similarities regarding their structural tendencies. That is, students tended to be selective as to which classmates they regard as friend or helper, and both networks were characterized by mutuality. However, looking at both networks descriptively, it was seen that the extent to which these tendencies are expressed differed. Amongst others, befriending classmates and becoming mutual friends was more common than engaging in help relations. There were thus quite some friendships in which there was no help relation, or one-sided help.

First, given previous research findings on how adolescents define friendship and what adolescents expect from friends (Hall, 2012; Hartup & Stevens, 1997), it was surprising to find that adolescents mention some classmates as friends, but that these same classmates were not salient to these adolescents as helpers. This partial overlap may be explained by the notion that not every adolescent may be in need of help, and may therefore not mention every friend as helper. However, about 20% of the students at every wave mentioned no classmate as helper (results available on request). Whereas some of them may indeed not need help, some may need help but have no helpers among their friends or classmates. In addition, the help question is quite general and broad, making it safe to assume that the majority of students was in need of a helper. Thus, the question might be whether help is as normative for friendship as has been suggested. Previous research has noted sex differences in this respect. For example, girls view self-disclosure, intimacy, and support as more important aspects of friendship than boys (Berndt, 1982; Bukowski, Newcomb, & Hoza, 1987; Hall, 2011). As such, friendships between boys may also fare without help or with one-sided help. In addition, it could be that adolescents maintain different friendships with different goals; with some friends, one may have an intense and intimate bond, whereas other peers are primarily befriended to hang out with and have fun. Some friends may even be identified as 'frenemies': Such 'ambiguous' friendship relations may contain ingredients of friendship, such as companionship and affection, but also of rivals, such as distrust and competition. In the context of the classroom, friends may rival over social status or over academic success, and may not be necessarily inclined to help each other reach their goals. Finally, our finding may illustrate that help-seekers make an appeal to friends' knowledge or skills, but that not all friends

are suitable to provide help. However, more research is needed to find out what makes some classmates salient as friend but not as helper.

Second, the partial overlap of friendship and help networks implies that help is not just part of friendship, but that it is a unique type of social relation that occurs also outside of friendships, and has a distinct set of dynamics. However, more information is needed to grasp what adolescents mean if they mention a non-friend as helper or if they do not mention a friend as helper. The finding that not all friends are salient as helpers, that some helpers are not friends, and that not all help nominations are mutual may indicate that help relations are particularly instrumental: They aid in attaining personal goals (e.g., finishing homework, improving well-being). Help networks are, however, quite stable over time and show similar characteristics as friendship networks, suggesting that help can be regarded as a longer standing relation having, like friendship, an affective component (Reid, Landesman, Treder, & Jaccard, 1989; Sullivan, Marshall & Schonert-Reichl, 2002).

Third, the results show that friendship and help networks do not only diverge at the dyadic level, but also at the classroom level. That is, looking at how both networks coincide within classrooms, it was seen that in classrooms characterized by mutual help relations, friendships not necessarily tended to be mutual, and vice versa. Also, the densities of the two networks did not necessarily correspond within classrooms. This may in part be the result of differences in individual preferences to form or reciprocate help or friendship nominations, but may also reflect a particular classroom atmosphere. For example, in classrooms with an emphasis on academic success, students might be inclined to help each other, but may be less oriented on social goals, such as making friends (Shim & Finch, 2014; Wentzel, 1994).

Thus, although friendship and help networks show some similarities, they only partly overlap. A further understanding of friendship and help networks is needed to understand which peers and friends adolescents typically target for help and with which purposes, and what underpins classroom differences in tendencies to befriend and help, as research on these topics is scarce.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

When interpreting the results, it is important to bear in mind the following limitations. First, previous research pointed out that help is more salient in girls' versus boys' friendships (Berndt, 1982; Bukowski, Newcomb, & Hoza, 1987; Hall, 2011): Self-disclosure more often results in friendships among girls than boys (Von Salisch, Zeman, Luepschen, & Kanevsi, 2014), and befriended girls help each other more often than befriended boys (Rose & Rudolph, 2006). Not surprisingly, girls also report higher levels of support in their friendships than boys (Bukowski et al., 1994; Colarossi, 2001). Whereas the effects we found (e.g., the effect of mutual versus one-sided help on friendship maintenance) will likely not differ for boys or girls, they may have been stronger for girls than for boys.

Second, we regarded help as an important driving factor for the initiation and maintenance of friendships, and vice versa. Whereas this is the case, there are many

other characteristics, behaviors and interactions that may facilitate friendship or help relations. For example, friendships are more likely initiated or maintained if adolescents share similar interests (e.g., musical taste; Selfhout, Branje, ter Bogt, & Meeus, 2009) or characteristics (e.g., ethnicity; McPherson, Smith-Lovin, & Cook 2001). There are also other factors than friendship that may contribute to help, such as the ability of the friend to provide help, and also similarity in characteristics (Van Rijsewijk et al., 2016). Whereas we controlled for a key friendship and helping selection mechanism (i.e., sex; McPherson et al., 2001; Van Rijsewijk et al., 2016), not all relationship formation mechanisms could be taken into account.

CONCLUDING REMARKS

This study has moved the field on adolescent positive peer relations forward by conceiving of friendship and help as two independent yet interrelated social interactions. We illustrated that mutual help may positively contribute to the maintenance but not initiation of friendship, and that friendship forms a context in which help takes place. However, we found that help also takes place outside friendships, and that not every friend is regarded as helper. These findings may encourage peer relations researchers to further examine which non-friends are typically targeted as helper, and which particular friends are suitable as helper. This study captured the independent and interdependent dynamics of friendship and help, contributing to the body of knowledge on the development of positive social relations of adolescents with peers.

Chapter 4

A description of classroom help networks, individual network position, and their associations with achievement

In this chapter, we investigated how the structure of the classroom help network and the individual position in this network are associated with early adolescents' academic achievement. We expected higher academic achievement to be found in classrooms with a dense help network; with no or few network isolates (i.e., students that did not give or receive help at all); in classrooms where help relations were less segmented; and in classrooms with equally distributed help nominations. Also, we expected higher achievement for individuals with more helpers and a more central position in the help network. The multilevel models suggested that achievement was lower only in classrooms where help relations were unequally distributed. Moreover, results seemed to suggest that individuals who were more centrally positioned in the help network showed higher achievement. Interestingly, classrooms varied strongly on network dimensions, and networks that would theoretically be expected to be most beneficial for achievement (with high density, few isolates, high equality, and low segmentation) were highly uncommon in our sample.

INTRODUCTION

Adolescents spend a large portion of their days in classrooms in the presence of their classmates. For this reason, it is important to know how students in the classroom get along with each other, and how these peer relations affect students' adjustment. Researchers have acknowledged this importance, and found that a positive classroom social climate has beneficial effects on many outcomes, including academic adjustment, mental health, and socio-emotional functioning (for reviews see Thapa, Cohen, Guffey & Higgins-D'Alessandro, 2013; Wang & Degol, 2016).

Traditionally, the classroom social climate has been captured using student perceptions of, amongst others, the extent to which classmates are nice towards each other (Fraser, Anderson, & Walberg, 1982). In more recent years, social network researchers added to this research by capturing the social climate more explicitly, demonstrating which students have positive relations with whom, and how these relations together shape the overall classroom climate. Using this social network perspective, it has been found that students in classrooms with a centralized network structure (i.e., a network in which students vary strongly in their number of social relations) are more supportive of aggressive behaviors (Ahn & Rodkin, 2014), less behaviorally and academically engaged (Cappella, Kim, Neal, & Jackson, 2013), and more likely to develop psychological problems at later age (Almquist, 2011).

Notwithstanding the importance of investigating the effect of classroom social climate on adjustment, one's individual position in the classroom network of social relations is as important for adjustment (Osterman, 2000). What is more – the overall classroom social climate is constructed from the social relations individuals have with their classmates. Therefore, when studying individual adjustment in the school context, research on the effects of peer relations should not focus on classroom social climate and individual social position as independent constructs, but should study these in concert.

Second, there is need to further examine how characteristics of the classroom network structure coincide within and vary over classrooms. Importantly, researchers argued that social network information can be utilized to initiate or stimulate change in behaviors or relations (Rulison, Gest, & Osgood, 2015; Valente, 2012). For example, social network data may provide information about whether all students are connected in the network, or whether links between students can be altered in order to make the network more cohesive. Therefore, it is important to gain knowledge on how classroom social networks can be characterized, and how individuals are embedded in these networks.

Third, research on positive relations in classrooms have focused mainly on 'liking' relations, best friendships, and 'hanging out together'. So far, no study has examined help networks and individual positions in help networks. Importantly, the extent to which students are helpful towards each other is a significant aspect of the classroom social climate, yet remains relatively understudied.

To address these three aspects, this study will focus explicitly on how classrooms

can be described in terms of the network of help relations among students, and the positions individuals take up in this help network. Because we study help in the school context, we are interested in how the structure of the help network and one's position in this network affect an outcome that is salient to the school context: Academic achievement. In this way, we build on previous research on classroom social climate by assessing the association of classroom network characteristics with academic achievement in conjunction with the effects of individual network position. Moreover, we extend previous work by taking a closer look at the characteristics of help networks and the individual embeddedness in these networks. This paper may provide insights into whether help networks can be used as a basis for teachers to assess where in the classroom network they may intervene to improve the overall classroom social climate and students' individual network position, which may ultimately contribute to adolescents' academic success.

THEORETICAL BACKGROUND

CLASSROOM HELP NETWORK

To clarify what is meant by a 'help network' and 'help relations' in this study, we now explain shortly how the help network is measured. We identified the adolescent network of helpers using a so-called peer nomination technique. Peer nominations have been frequently used to identify relations or interactions between individuals - for example, friendships, liking, and also help (see Baerveldt, Van Duijn, Vermeij, & Van Hemert, 2004; Dijkstra, Lindenberg, Verhulst, Ormel, & Veenstra, 2009). Following this procedure, we asked adolescents to identify classmates who '*help them with problems (for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down)?*'. Aggregating these help relations to the classroom level, global network patterns can be distinguished. We focused on cohesion within the help network, segmentation of help relations, and inequality in the number of help relations. Cohesion refers to the extent to which help relations in the classroom are present; segmentation refers to the tendency of students to limit their (help) interactions to a select group of classmates; and inequality refers to an unequal division of help relations in the classroom, in which some students have many helpers and others have little or few helpers. Together, these dimensions capture not only the presence of help relations, but also the way in which help relations are patterned. Below, it is explained how these dimensions may relate to academic achievement.

COHESION

As environment for academic and socio-emotional development, it is argued that classrooms may function as 'competence enhancing contexts', or 'optimal learning environments', stimulating students' engagement in academic activities (Cefai, 2007; 2014). Optimal classroom climates are described as environments in which students are connected with each other through positive, supportive relationships. In such contexts, students respect and trust each other, and feel safe and valued by peers, providing a good

foundation for academic learning. Particularly classrooms with cohesive help networks may function as competence enhancing contexts, as the widespread giving and receiving of help is highly reflective of such a foundation (Eisenberg, Fabes, & Spinrad, 2006; Nadler, 2015). Indeed, asking for help requires trust towards peers, and the confidence that one will not be rejected or ridiculed as a response. Helping others requires the capacity to put oneself in peers' position and the ability to respectfully deal with peers' issues. These positive characteristics may affect students' motivation to go to school and to participate actively in academic activities by making their classroom a safe and enjoyable place (Urdan & Schoenfelder, 2006). Indeed, students are less likely to skip school when students respect, trust, and care about others (Hendron & Kearney, 2016), and a general positive school climate stimulates the completion of homework and active student participation in classroom academic activities (Green et al., 2012). Other studies found that being in peer contexts characterized by positive and supportive relations is related to less individual learning difficulties (Chunghall & Chen, 2010), and that students show higher academic motivation when they expect each other to share and cooperate (Wentzel, Battle, Russell, & Looney, 2010).

Second, students are likely more able to focus on school work when they feel emotionally and physically healthy (Roeser, Eccles, & Sameroff, 1998). Although researchers did not focus explicitly on help, it was found that positive classroom climates contribute to student health outcomes (for a review see Wang & Degol, 2016). For example, the extent to which students perceive their schoolmates to like and befriend each other has been associated with less symptoms of depression (Loukas & Robinson, 2004). In addition, students show more emotional problems in classrooms where they witnessed negative peer interactions or marginalization of other classmates, even if they were not marginalized by peers themselves (Huitsing, Veenstra, Sainio, & Salmivalli, 2012; Meilstrup et al., 2015). Similarly, negative peer climates were found to predict psychosomatic complaints, such as head- and stomach aches, trouble falling asleep, and loss of appetite (Modin & Östberg, 2009). Arguably, these complaints might affect the concentration and ability to finish schoolwork and participate actively in the classroom. Therefore, we expect that

> cohesion in the help network is positively associated with academic achievement (Hypothesis 1)

SEGMENTATION

Importantly, however, not only *whether* students help others may matter, it may also matter whether students limit their helping interactions to a specific set of peers. Indeed, part of what has been previously defined as a negative classroom atmosphere is '*the extent to which students refuse to mix with the rest of the class*' (Fraser et al., 1982; Walberg & Greenberg, 1997). That is, students might help others, but while limiting their help to a small group of familiar classmates. Whereas such a pattern does not necessarily

mean that one refuses to mix with other classmates, helping classmates outside of the boundaries of one's group might be indicative of more generalized respect and trust. In line with this, it was found that children show better academic adjustment in classrooms where children do not limit their play interactions to a specific set of peers (Van den Oord & Van Rossem, 2002), and that school grades were lower in classrooms where children 'hung out' with each other in cliques (Berger, Alcalay, Torretti, & Milicic, 2011). Based on this, we expect that

> segmentation of the help network is negatively associated with academic achievement (Hypothesis 2)

INEQUALITY

Previous research has indicated that inequality in the division of social relations is salient for student academic outcomes: Students were more engaged in academic tasks in classrooms that had equitably distributed 'hanging out' relations, and highly equal networks buffered the negative impact of student difficulties (e.g., behavioral and relational problems) on student academic engagement (Cappella et al., 2013). Inequality may also elicit or increase emotional symptoms (Almquist, 2011; Kiesner, 2002; Östberg, 2003) and stimulate the approval of aggressive behavior in the classroom (Ahn, Garandeau, & Rodkin, 2011; Ahn & Rodkin, 2014; Babarro, Diaz-Aguado, Arias, & Steglich, 2016), both which might in turn negatively affect achievement. The underlying mechanism explaining these findings might be that inequality in the division of social relations might trigger social comparison and competition between classmates (see Ahn & Rodkin, 2014). Indeed, inequality in help implies unequal access to the social (e.g., affection) and instrumental (e.g., access to knowledge and skills) benefits that help provides. This might be especially detrimental for adolescents, who generally develop a heightened concern for their position in the peer group (Adler & Adler, 2003; Elkind & Bowen, 1979; Simmons, Rosenberg, & Rosenberg, 1973). Research pointing in this direction demonstrated that competition in the school context increases adolescents' academic self-consciousness, indicating that students were fearful to make mistakes in front of classmates, were embarrassed in school, and nervous to perform in front of peers (Roeser, Midgley, & Urdan, 1996), potentially hampering their school adjustment. Taken together, we expect that

> inequality in the help network is negatively associated with academic achievement (Hypothesis 3)

INDIVIDUAL POSITION IN THE HELP NETWORK

While a general abundance of help relations in the classroom may foster academic achievement by providing a pleasant learning atmosphere, students own relations with classmates matter as well (for a review see Osterman, 2000). Generally, the social

position of students in classrooms has been assessed by asking students whether they felt accepted and valued by classmates (e.g., Goodenow, 1993; Nelson & DeBacker, 2008; Wentzel & Caldwell, 1997), or by using peer nominations on (dis)liking and friendship, and constructing labels such as 'popular', 'rejected', and 'neglected' (e.g., Aparisi et al., 2015; Wang et al., 2016; Wentzel, 1995; Zettergren, 2003). The present study will follow a similar peer nomination approach. However, we determine the network position of students not only by the number of times they nominate classmates as helpers, but also by whether they are isolated from the network (i.e., do not receive and give nominations for help), and by the centrality of their location in the network (i.e., whether they can easily 'access' peers in the network for help). We chose these indicators of individual network position as they have parallels in the classroom network structure indices. Cohesion has a direct parallel in the individual number of helpers and the individual being an isolate. Segmentation and inequality are network concepts that are not direct aggregates of individual network positions. Yet, to have a richer image of the individual position in the classroom network, we do not only take into account the number of helpers and isolation, but also their centrality, i.e., their social distance to other classmates.

NUMBER OF HELPERS, ISOLATION, AND CENTRALITY

Generally, previous research has shown that individual perceptions of classroom belonging (e.g., whether peers wanted to work with or liked the individual) affect academic motivation and expectancies for academic success in early adolescents (Goodenow, 1993). Similar findings have been reported for the perception of being valued and respected by peers (Nelson & DeBacker, 2008), the perception of having supportive classmates (Danielsen, Samdal, Hetland, & Wold, 2009), and being included in the peer group (Nichols & White, 2001; Wentzel & Caldwell, 1997). Moreover, academic outcomes vary among students with differing peer status, with high-status students generally having higher achievement than their low-status peers (Wentzel, 1995; Zettergren, 2003). Furthermore, 'invisibility' in the classroom (having neither negative nor positive peer and teacher relations) was related to relatively low liking for school (Wang et al., 2016) and low achievement (Aparisi et al., 2015; Nichols & White, 2001).

Similar findings arguably apply to help: As mentioned before, being helped by classmates offers social benefits, and may hence foster classroom belonging. Additionally, the informational and instrumental benefits provided through help may help students to tackle (academic) problems and improve achievement. Indeed, receiving help from classmates has been related to increased academic motivation in early and middle adolescents (Wentzel, Battle, Russell, & Looney, 2010). In addition, a central position in the help network might aid to find potential help(ers): When one is helped by few classmates, or only by a specific group of classmates, access to resources and the diversity of resources might be limited. In line with this, it has been found that university students performed better if they sought advice from a higher number of peers in the network, but also if their social distance to all others in the advice network was shorter (Cadima,

Ojeda, & Monguet, 2012). Similarly, adolescents who indicated that they 'hung out' with multiple peer cliques in the classroom showed higher academic achievement (Nichols & White, 2001). Thus, we expect that

> number of helpers is positively associated with academic achievement (Hypothesis 4)
>
> isolation from the help network is negatively associated with academic achievement (Hypothesis 5)
>
> and higher centrality in the help network is positively associated with academic achievement (Hypothesis 6)

Taken together, we expect higher achievement in classrooms with a cohesive help network; in classrooms where help relations are less segmented; and in classrooms with equally distributed help relations. Also, we expect higher achievement for individuals with more helpers and a more central position in the help network.

Methods

PROCEDURE

In the present study, we use a subsample of the data from the SNARE-project (Social Network Analysis of Risk behavior in Early adolescence; see Dijkstra et al., 2015), a study aimed at investigating the behavioral and social development of (early) adolescents. Prior to the data collection, all eligible students and their parents received an information letter, in which they were asked to participate. If students wished to refrain from participation, or if their parents disagreed with their children's participation, they were requested to send a reply card or email within ten days. We emphasized during every assessment that participation was anonymous and could be terminated at any point in time. The SNARE study has been approved by the ethics committee of one of the participating universities. During the assessments, a teacher and research assistant(s) were present. The research assistant gave a brief introduction, and the students then filled in the questionnaire on the computer during class. The assessment of the questionnaires took place during regular school hours within approximately 45 minutes. Students who were absent that day were, if possible, assessed within a month.

PARTICIPANTS

We examined the networks of all first and second grade classrooms of the school in the north of the Netherlands. For this study, we used the networks as assessed in December 2011 to examine associations with academic achievement as assessed in April 2012. Students who joined or left the school during the period December – April were removed from the sample, as for the joiners all network data were missing, and

for leavers school grades were missing. Also, for five classrooms, no school grades were available. In total, the study sample contained 54 participating classrooms (*M* classroom size = 21.3 students, *SD* = 4.7) and 1,144 students (*M* age = 13.1 years, *SD* = 0.7, 49.0% boys, 94.7% Dutch). Students had, on average, a slightly lower SES than the average Dutch SES. 35 students were absent during the assessment in December, and 39 students were absent during the assessment in April. However, this affected only the information on their individual network position. Furthermore, some participants (30 students across 20 classrooms) named (almost) everyone in their classroom as helper, whereas they hardly named anyone at the preceding and/or next assessment. In addition, their help nominations were hardly or not reciprocated. These extreme (out)degree outliers may have interpreted the question differently from their classmates. Also, they distorted the structure of the classroom network. We recoded their outgoing nominations as missing, but all other information about these outliers (their incoming nominations, classroom network indices, and achievement) was retained. Previous network research has used similar strategies to handle extreme outdegree outliers (e.g., Light, Greenan, Rusby, Nies, & Snijders, 2013).

MEASURES

Information on students' academic achievement was retrieved from the school administration, and derived from the school report card of April, presenting the average of grades received until April for each subject separately. Grades can range from 1 (lowest) to 10 (highest), where 5.5 or higher stands for a pass. We calculated the average grade over three school subjects of which the final exam is compulsory for students in every academic track: Dutch language, English language, and mathematics.

The structure of the classroom help network and individual network position were calculated on the basis of a peer nomination question, for which students were asked to name classmates who '*help you with problems (for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down)?*'. Similar peer nomination questions were used in previous studies investigating adolescent help relations (e.g., Baerveldt et al., 2004; Dijkstra et al., 2009), where they were associated with individual outcomes and other peer relations.

Cohesion: Density and proportion of isolates. Cohesion in the help network was captured using two indices: Density, and the proportion of isolates. The density of a network refers to the actual number of relations in the network relative to the possible number of relations (that is, if everyone were to nominate everyone else in the network as helper). The value can run from 0 to 1, ranging from nobody nominating anyone in the network as helper (value 0) to everyone nominating everyone else (value 1). An isolate is an individual that has neither outgoing nominations (outdegree = 0) nor incoming nominations (indegree = 0). That is, the individual does not nominate helpers, and is not nominated by peers as helper, and is isolated from the help network. The proportion of isolates refers to the number of isolates in a classroom relative to the size of the classroom.

Segmentation. Following the definition of Baerveldt and Snijders (1994), a segmented network is divided into several subgroups *within which* people are closely connected to each other, and *between which* people are far removed from each other. The segmentation index (Baerveldt & Snijders, 1994) is based on so-called path lengths between students. Two students can be connected through a direct relation (path length 1), or indirectly through a sequence of relations (path length 2 or higher). Isolates are not connected to the network, and their path length to other students in the network is 'infinite'. The definition of segmentation implies that there should be relatively few intermediate path lengths (path length 2) connecting students with each other relative to long path lengths (path length 3 or higher). The segmentation index compares the frequency of path lengths ≥ 2 to path lengths ≥ 3. The index can run from 0 to 1, where 1 refers to a highly segmented network in which there are no path lengths 2: It is a network of disconnected cliques. Value 0 refers to networks where there are no path lengths 3 or longer, and where all individuals in the network are either directly connected or through only one intermediary. We chose 3 as a cut-off point, as path lengths of 3 and longer are relatively less common in our data, and thus relatively lengthy, as compared to path lengths of 2. For the purpose of calculating the segmentation index, we did not take into account the direction of ties. If the direction of ties were to be taken into account, there would be no path between A and C if A→B and B←C, whereas there would be if A→B and B→C. As a result, very many path lengths in the network would have been 'infinite'. To overcome this problem, we transformed the network from a directed network into an undirected network for the calculation of segmentation, in which tie A→B or A←B transforms into A↔B.

Inequality. We captured inequality in the distribution of help relations by calculating the (out)degree variance, which refers to the variance between students with respect to the number of helpers they nominate (see Snijders, 1981). A higher value for inequality indicates that there is a higher variance around the mean outdegree.

Individual network position. Number of helpers was measured as the sum of outgoing nominations, representing how many classmates a student nominated as helper. Isolation represents whether or not a student received and gave help. If an individual did not have any incoming and outgoing nominations (i.e., is an isolate in the help network), an individual was coded 1 on this variable, and 0 otherwise. Finally, centrality is, like segmentation, based on path lengths. We first divided 1 by the individual path lengths to others in the network. In this way, distance 'infinite' became value 0, distance 4 became 0.25, 3 became 0.33, 2 became 0.50, and 1 remained 1. For each individual, we then averaged these values. This resulted in a variable running from 0 to 1, where 0 indicates that the individual is an isolate, and 1 indicates that an individual is directly connected to everyone in the network. This index is known as the Gil-Schmidt centrality index (Gil & Schmidt, 1996).

Control variables. Because the network indices we take into account may interrelate with the number of students in the classroom, we control for classroom size

In addition, to take into account the differences typically found between boys and girls regarding their academic achievement (Voyer & Voyer, 2014) we control for sex. Girls were coded 0 and boys were coded 1.

ANALYTICAL STRATEGY

To describe help networks, we present the mean and standard deviation of the study variables and the correlations between them in Table 4.1. Following up on the correlations, in which it was seen that the classroom predictors correlated amongst each other, we made a scatterplot to gain better insight in the way these predictors coincide in classrooms (Figure 4.2). Subsequently, we ran a *K*-means cluster analysis to assess whether meaningful clusters of classrooms could be identified, and presented the average academic achievement found in these clusters. The three-cluster solution is presented in Figure 4.2. To test our hypotheses, we employed multilevel modelling (Snijders & Bosker, 2012) using xtmixed in Stata (Rabe-Hesketh & Skrondal, 2012). As students were nested in classrooms (and in one school only), we distinguish two levels in our multilevel model; the individual student, and the classroom in which they are nested. We first estimated an intercept-only model in order to calculate the intraclass correlation, expressing the degree of resemblance in achievement between students residing in the same classroom. This shows how much of the variance in academic achievement can be attributed to differences between students and between classrooms. We then estimated a model with all classroom predictors simultaneously, after which all individual predictors were added in a second model. Because the classroom predictors correlated amongst each other, we estimated separate models in which the individual predictors and the corresponding classroom predictor were included. In addition, because individual centrality correlated highly with the other individual predictors, we estimated a model without centrality. Finally, a full model was estimated in which all predictors were included at once. Because no substantial differences were found as compared to the results of this full model, only the full model is presented in Table 4.2.

RESULTS

DESCRIPTIVE STATISTICS

Academic achievement was normally distributed with values ranging between 2.97 and 9.37, and a mean of 6.88 (SD = 0.93).

DESCRIPTION OF CLASSROOM NETWORK INDICES

The density in classrooms ranged from .03 to .29, with an average of .12 (SD = .04). Thus, in the densest help network, about one third of all possible help relations in the classroom were actual relations, whereas this was 12% on average. The proportion of isolates ranged from 0 to .50 (M = .06, SD = .09), where .50 was an outlier (it was followed by value .31). If there were isolates in the classroom, their number ranged from 7 (followed by 4) to 1.

Table 4.1

Descriptives of and bivariate correlations between the study variables

	Min	Max	M	SD	N	1	2	3	4	5	6	7	8	9	10
Classroom predictors															
1 Density	.03	.29	.12	.04	54										
2 Proportion of isolates	.00	.50	.06	.09	54	−.47**									
3 Segmentation	.33	.98	.69	.17	54	−.74**	.50**								
4 Inequality	−.02	.30	.11	.07	54	.62**	−.23	−.67**							
5 Classroom size	12	28	21.27	4.69	54	−.20	−.43**	.02	−.09						
Achievement and individual predictors															
6 Academic achievement	2.97	9.37	6.88	0.93	1127										
7 Number of helpers	0	14	2.59	2.66	1074						.08**				
8 % Isolation	0	1	5	.19	1127						−.03	−.24**			
9 Centrality	0	.86	.39	.19	1074						.11**	.55**	−.47**		
10 % Sex (1 = boy)	0	1	49		1138						−.15**	−.26**	.13**	−.17**	

Note. ** p < .01.

In many networks, however, no one was excluded from help relations, as there were no isolates at all in 22 of the 54 classrooms.

The segmentation index ranged from .33 to .98, with an average of .69 (*SD* = .17). This means that every classroom was segmented to some extent. Even in the classroom with the lowest segmentation index, 50% of the path lengths was intermediate (distance 2), and 50% of the path lengths was short (distance 1) or relatively long (distance 3 or 4). In the classroom with the highest segmentation index, only 2% of the path lengths was distance 2, and 98% of the paths lengths was distance 1 or infinite. Differences in segmentation are illustrated by the sociograms depicted in Figure 4.1, in which the nodes represent individuals and the lines represent a help relation. The classrooms in this Figure scored high (.92) and low (.33) on the segmentation index, respectively.

Inequality ranged from −.02 to .30 (*M* = .11, *SD* = .07). In the classroom with the lowest inequality, each individual had one or two helpers, and one individual mentioned three. In the classroom with the highest inequality, the number of helpers generally ranged from 1 to 3, but three individuals mentioned 4, 7, and 9 helpers, respectively. Illustrating the direction of inequality, we found that the skewness of the individual number of helpers was positive in all classrooms (*M* = 1.09, *SD* = 0.53, min = 0.07, max = 2.17). This indicates that, generally, many students had a few helpers, whereas few students had many helpers. In the classrooms with a moderate positive skew, the number of helpers were more evenly spread out over the range of number of nominations in that classroom. The classrooms in Figure 4.1 scored high (.21) and low (.10) on inequality, respectively.

In summary, the majority of students was connected to classmates through help relations. However, students tend to cluster in help cliques, making the networks generally quite segmented. Lastly, in most classrooms, there was a tendency for help to be unequally distributed over students. This was caused by the presence of some students who were helped by relatively many others. In relatively equal help networks, this was less the case.

DESCRIPTION OF INDIVIDUAL POSITION IN THE HELP NETWORKS

On average, students mentioned about 2.59 classmates as helper (*SD* = 2.66). Some students nominated no helpers, whereas others nominated as many as 14. There were 61 isolates in the sample (5.4%), spread out over 32 classrooms. Individual centrality scores varied widely over individuals, with some students being isolates (value 0), and some individuals very well positioned in the network (value .86). The number of help relations students had, however, did not necessarily improve their centrality in the network: Figure 4.1, for example, shows that individuals A and B have the same number of relations (three), but that individual B (centrality score .26) is better positioned than individual A (centrality score .18), as B can access more classmates in the network through relatively short path distances.
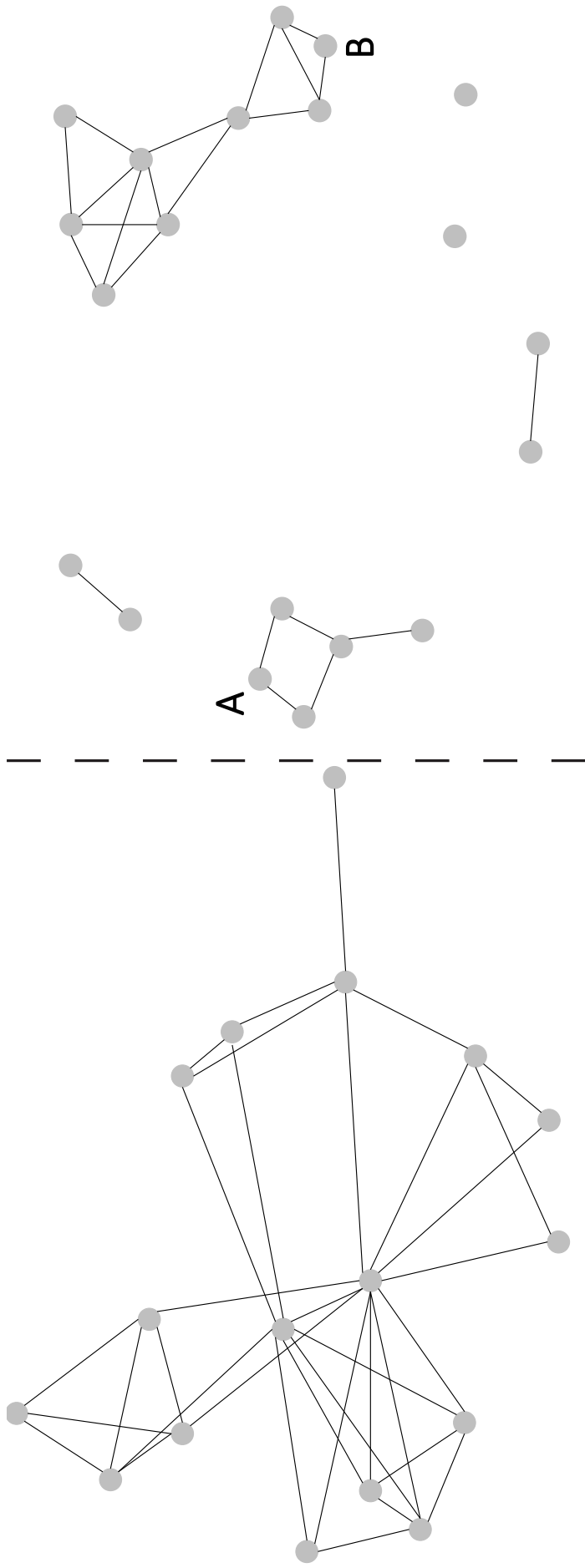
Figure 4.1

Left: Sociogram of a help network with low segmentation (value .33) and high inequality (value .21)

Right: Sociogram of a help network with high segmentation (value .92) and low inequality (value .10), highlighting individuals with relatively low (A) and high (A) centrality

CORRELATIONS

Bivariate correlations between the network indices are displayed in Table 4.1. Density was moderately and negatively correlated with the proportion of isolates ($r = -.47$, $p < .01$), positively with inequality ($r = .62$, $p < .01$), and more strongly and negatively with segmentation ($r = -.74$, p < .01). Furthermore, segmentation was moderately and positively related to the proportion of isolates ($r = .50$, p < .01) and more strongly and negatively related to inequality ($r = -.67$, p < .01). Regarding individual network position, especially centrality was correlated with other individual variables: Centrally positioned individuals reported a higher number of helpers ($r = .55$, p < .01) and were less likely isolated ($r = -.47$, p < .01). Achievement was positively correlated with the number of helpers and centrality ($r = .08$, $p < .01$; $r = .11$, $p < .01$), although these correlations were small. Finally, boys had lower school grades than girls ($r = -.15$, p < .01).

FURTHER EXPLORATION OF THE CORRELATIONS: SCATTERPLOT OF CLASSROOM NETWORK INDICES AND *K*-MEANS CLUSTER ANALYSIS

To gain better insight into the correlations of classroom network indices amongst each other, we produced a scatterplot in which classrooms are represented by nodes (Figure 4.2). The position of the nodes on the *X*-axis and *Y*-axed was determined by their value for segmentation and inequality, respectively. Also, each node has a color (black, dark grey, or light grey), corresponding to the level of network density. For the purpose of clarity, density was truncated into low, medium, and high values (lower than, around one, and higher than one standard deviation from the mean density, respectively). The nodes also differ in size, corresponding to the proportion of isolates. The proportion of isolates was also truncated (no isolates, up to one standard deviation from the mean, and higher than one standard deviation from the mean).

First, as the negative correlation implies, the scatterplot indicates that there was little inequality in highly segmented classrooms. However, we expected both to be indicators of a positive classroom atmosphere, and thus, implicitly, that these would correlate positively. Further inspection of the networks revealed that this negative correlation was caused by a few individuals that were highly central in the network (increasing inequality), who, at the same time, linked classmates from different help cliques together (lowering segmentation). The presence of these central individuals also explains the positive link between density and inequality. Thus, the inequality in the network seemed to counter segmentation of the network, and heightened network density. Second, the scatterplot demonstrates that classrooms theoretically expected to be most beneficial for achievement (i.e., with high density, few isolates, an equal distribution of nominations, and little segmentation), of which some can be found in the lower left section of the plot, were highly uncommon in our sample. Thus, there were hardly any classrooms in which the positive network characteristics all coincided. Lastly, the scatterplot shows that it is difficult to identify a typical classroom, as classrooms vary widely in their network structure. Only few classrooms looked similar on all four
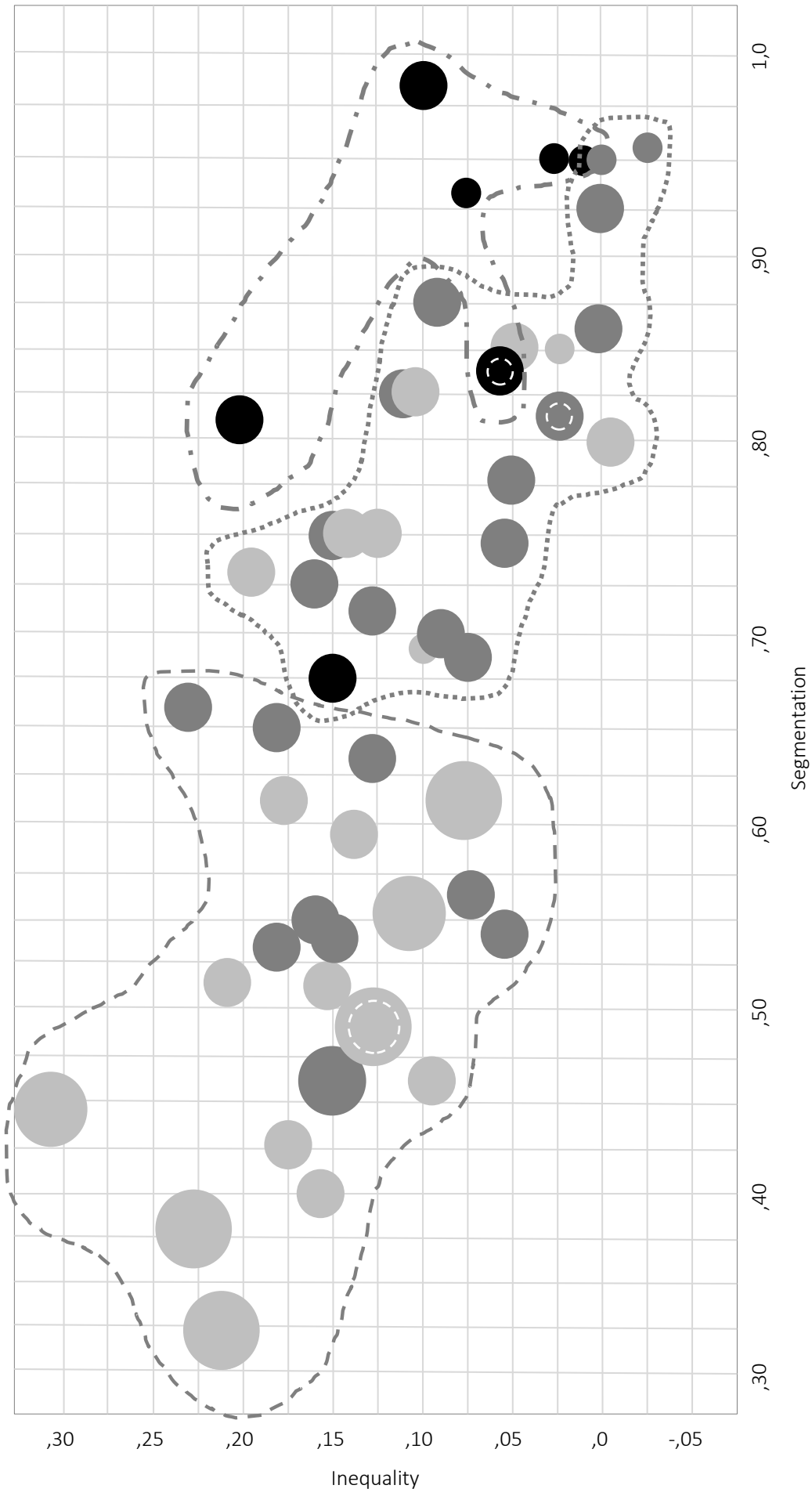
Figure 4.2
Scatterplot of the association between segmentation and inequality, with density and proportion of isolates indicated by the node's size and color, respectively.
The lines refer to the three different clusters of classrooms based on these characteristics, as identified by a K-means clustering procedure

dimensions (e.g., the three top left classrooms all have similar segmentation, inequality, density, and proportion of isolates). However, in an attempt to typify classrooms on the basis of their network characteristics, we ran a *K*-means cluster analysis using density, the proportion of isolates, inequality and segmentation as input variables. The algorithm of the *K*-means cluster analysis aims to minimize within-cluster heterogeneity, and can as such identify groups of classrooms that are relatively similar on the four network dimensions. The algorithm does not identify the number of clusters, and these have to be specified by the user. In our case, the three cluster solution seemed most optimal, as the number of classrooms in each cluster became very small starting from a 5-cluster solution, and the 4-cluster solution identified clusters of which two were quite similar on all dimensions.

The first, most typical group of classrooms (*N* = 26) is depicted on the right side of the scatterplot, and was characterized by medium density (*r* mean = .11), low proportion of isolates (*r* mean = .05), low inequality (*r* mean = .08) and high segmentation (*r* mean = .79). Theoretically, this type of classroom seems beneficial for achievement, although it is characterized by high segmentation. The second cluster (*N* = 22), perhaps theoretically most beneficial for achievement, is depicted on the left side of the scatterplot, and was characterized by high density (*r* mean = .15), few isolates (*r* mean = .02), and medium levels of inequality and segmentation (*r* mean = .16; .52). The third and smallest cluster (*N* = 6) was primarily characterized by a high proportion of isolates (*r* mean = .27). This cluster also showed medium density (*r* mean = .07), low inequality (*r* mean = .08) and high segmentation (*r* mean = .91). Although it is difficult to statistically compare means based on a relatively small number of classrooms, highest achievement scores were on average found in the second cluster (*M* = 7.01, *SD* = 0.41). The first and third cluster showed similar average achievement scores (*M* = 6.84, *SD* = 0.35; *M* = 6.89, *SD* = 0.58).

RESULTS MULTILEVEL ANALYSIS

For each variable, Table 4.2 presents the estimated coefficients *b*, their standard errors *SE*, and the *p*-values for testing the value of 0. Also, we present the likelihood ratio test, comparing the fit of the full model as compared to the intercept-only model. The intercept-only model is presented in the first column of Table 4.2, and was used to estimate the intraclass correlation. Results suggested that 14% of the variance in academic achievement could be attributed to differences between classrooms, and 86% could be attributed to differences between students. The full model was a significant improvement of the intercept-only model ($\chi 2$ = 56.30, *d.f.* = 9, *p* < .001), and explained 33.3% of the variance on the classroom level and 3.7% of the variance on the individual level. For interpreting the effects on achievement, note that achievement grades range theoretically from 1 to 10, in this data from 3.0 to 9.4, with a standard deviation of 0.9.

At the classroom level, the results reveal that inequality was significantly associated with achievement (*b* = −2.67, *SE* = 0.98, *p* = .01), which supports our hypothesis that achievement was lower in more unequal classroom help networks

(Hypothesis 3). The result indicates that achievement decreased by about one point if inequality increased by one third of the range of inequality. Hypothesis 1 and 2 were not supported, as there were no associations of density, proportion of isolates, or segmentation with achievement. Classroom size had a small but significant negative association with achievement ($b = -0.03$, $SE = 0.01$, $p = .02$), indicating that achievement decreased by 0.03 points when classroom size increased with one individual. Decreasing 0.5 point in academic achievement would thus 'require' an increase of 17 in classroom size, demonstrating that the association is relatively small.

At the individual level, the model suggests that individual centrality in the help network was positively associated with achievement although the effect was not very large and significant at $p = .08$ ($b = 0.51$, $SE = 0.29$, $p = .08$). Thus, the hypothesis stating that centrally positioned individuals show higher achievement (Hypothesis 6) had no strong support. Hypothesis 4 and 5 were also not supported, as individual number of helpers and isolation were not associated with achievement. Lastly, and as expected, boys had lower academic achievement than girls ($b = -0.29$, $SE = 0.06$, $p < .001$).

Supplementary analyses. Because associations of classroom and individual network indices with achievement may vary between classrooms, we tested for random slopes. Furthermore, we tested for interactions between the classroom network indices and individual network position, as effects of the classroom network may depend on

Table 4.2
Estimated multilevel coefficients for the association of classroom and individual network indices with academic achievement (N = 54 classrooms; 1,056 students[a])

Parameters	Intercept only			Full model		
	b	SE	p	b	SE	p
Intercept	6.91	0.05	.00	7.84	0.75	.00
Classroom predictors						
Density				2.09	2.15	.33
Proportion of isolates				−0.13	0.78	.87
Segmentation				−0.31	0.51	.55
Inequality				−2.67	0.98	.01
Classroom size				−0.03	0.01	.02
Individual predictors						
Number of helpers				0.00	0.01	.82
Isolation				0.11	0.14	.46
Centrality				0.51	0.29	.08
Sex				−0.29	0.06	.00
Classroom variance	.21	.03		.08	.02	
Individual variance	.74	.03		.72	.03	
Likelihood ratio test (d.f. = 9)				56.30		.00

Note. [a] Decrease in analytical sample size due to missing values.

one's individual network position. For example, a highly dense help network might not be beneficial for individuals with few helpers. In addition, as help is more salient for girls' than for boys' relationships (Colarossi, 2001; Furman & Buhrmester, 1992), we tested for interactions between sex and the network and individual indices. None of the random slopes or interactions were significant.

Discussion

This study investigated the structure of adolescent classroom help networks, the positions individuals take up in this help network, and their associations with academic achievement. We captured help networks by asking adolescents to mention classmates who '*help them with problems (for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down)?*'. Aggregating these help relations to the classroom level demonstrated how students in a classroom were precisely connected with each other through help. We assessed the extent to which help relations were present (cohesion), whether these help relations were clustered in groups (segmented), and the extent to which help relations were unequally distributed over students (inequality). Similarly, on the individual level, we assessed how many helpers students reported, whether students were isolates (i.e., did not give or receive help at all), and the centrality of their position in the help network. Subsequently, we examined how these network indices were associated with adolescents' academic achievement.

FINDINGS ON CHARACTERISTICS OF THE CLASSROOM HELP NETWORK AND INDIVIDUAL NETWORK POSITION

To our knowledge, classroom help networks in adolescence have not been investigated yet, which is why we looked further into what help networks look like within and across classrooms. First, whereas part of the aim of this study was to provide a coherent description of what classroom help networks generally look like, they appeared challenging to characterize; that is, they varied in density, proportion of isolates, segmentation, and inequality, and there were only few classrooms that were similar regarding these four dimensions together. This finding underlines the complexity of the social context in which students and teachers spend their days, and that it may be difficult to speak of a typical classroom, or a classroom that is typically 'good' or 'bad' for adjustment. For educational practice, the intricacy of this social context suggests that designing schoolwide interventions aimed at improving student well-being is challenging. Instead, interventions should be tailored to the classroom level. A social network approach, providing insight into the structure of one specific classroom help network, may be a promising avenue for intervention development: It may aid teachers in intervening in specific classrooms by helping them to navigate the social climate in a specific classroom, and give them ideas about students who have a more vulnerable or stronger network position than others. Social network information may serve as input regarding whether some help relations

may be fostered or altered to ensure that, for example, each student is equally embedded in the network.

Second, we found that classroom help networks that were theoretically expected to be most beneficial for academic success (i.e., with high density, few isolates, low inequality, and little segmentation) were highly uncommon in our sample. In addition, every classroom help network was segmented and unequal to some extent. The absence of 'ideal' classrooms might suggest that researchers should adjust their notion of what is a beneficial or detrimental social environment for adolescents. That is, students organize themselves in ways that are theoretically speaking not ideal for their adjustment; yet, apparently, this is the natural way in which they organize their social environment. This stresses a need to further delineate the mechanisms underpinning the complex and theoretically 'counterintuitive' structure of social relations. Possibly, 'suboptimal' network structures may arise through the self-organizing capacity of networks (Robins, 2015): That is, preferences for relationship formation at the individual level (such as the tendency to reciprocate help, or help similar others [Van Rijsewijk et al., 2016]) may result in higher level, clustered, network structures. This finding also emphasizes a need to examine in more detail in what way certain characteristics of social networks are beneficial or detrimental for adjustment. For example, inequality might not be detrimental to the classroom atmosphere if the individuals that report relatively many helpers are indeed in high need of help; or isolation of individuals in the help network may be detrimental to achievement only if these individuals are isolated from other positive networks as well. The finding that students organize their help networks in a way that is theoretically 'suboptimal' but otherwise natural also raises the question whether teacher intervention in these naturally emerging social settings would eventually affect students' adjustment in a favorable way: Research by Gest and Rodkin (2011) suggested that teachers' attempt to foster social relations through grouping arrangements may actually result in adverse classroom outcomes, such as a higher acceptance of aggressive behaviors and lower acceptance of prosocial behaviors. Perhaps, social network information might be of use only if teachers cooperate with students in interpreting this information: Teachers may discuss the classroom social network and social network positions together with their students, so that changes in social relations are in accordance with students' preferences.

Third, although classrooms generally showed quite 'suboptimal' help network patterns, students' individual network positions seemed to be more in line with what is considered beneficial for adjustment. That is, the majority of individuals indicated that they received help from their classmates, and there were hardly any individuals that were completely isolated from the helping network. These descriptive findings reveal an interesting discrepancy: On the individual level, help seems optimally organized, yet aggregating help relations to the classroom level shows how potential suboptimal social processes (such as inequality and segmentation) are taking place nevertheless –and affect achievement, as will become clear below. This underlines the importance of taking into account individual embeddedness in a social context together with characteristics of this

social context when studying adolescent adjustment, or when developing interventions aimed at improving adolescents' adjustment.

ASSOCIATIONS OF CLASSROOM HELP NETWORK CHARACTERISTICS WITH ACHIEVEMENT

Building on earlier research (Cefai, 2007; 2014), we generally expected students' academic achievement to flourish in classrooms in which help was abundant. That is, students would show higher achievement in classrooms in which many students helped each other, and in which help relations were equally distributed and not segmented. Our multilevel results were partly consistent with the expectations. Regarding the associations between characteristics of the help network and achievement, it was shown that higher inequality in the distribution of helpers was associated with lower academic achievement. This finding was in line with previous findings on inequality in social relations and behavioral outcomes (e.g., Van den Oord & Van Rossem, 2002) and it was argued in these studies that inequality may affect outcomes, such as achievement, by triggering feelings of comparison and competition amongst students (Ahn & Rodkin, 2014). In our study, inequality was high in classrooms where there were a few central students who reported to have many helpers among their classmates, whereas there were many students who reported only few helpers. This type of inequality has been often found in social networks (Borgatti & Everett, 1999; Rivera, 2010) and has been referred to as a process of preferential attachment: Those individuals who have many social relations tend to attract additional social relations in the future. Although we assessed help networks only at one time point, it might have been the case that students who received help from many classmates at some point received even more help at later time points (a 'rich-get-richer'-effect). Thus, over time, access to helpers (and to their skills and knowledge) might have concentrated on a relatively small set of classmates. As argued, this may trigger comparison or competition among students, but may also contribute to feelings of injustice; students may find a situation in which only some central classmates benefit from the skills and knowledge of classmates unfair. These mechanisms, argued to hamper achievement by undermining a positive classroom atmosphere, have hitherto not been explicitly tested. More research is needed regarding the mechanisms underpinning the consistent negative association found between inequality and adolescent adjustment.

Furthermore, although we expected that classroom segmentation would be associated with lower achievement, we did not find support for this expectation. We argued that positive traits that accompany giving and receiving help, such as respect and trust, would be more widespread in classrooms where students helped peers also outside the boundaries of specific groups of classmates. This would, in turn, positively affect achievement. Given that we found no association between segmentation and achievement at all, it might be that segmentation might be detrimental to achievement only if students are not only structurally, but also socially segmented; that is, if subgroups emerge of students similar on, for example, skills or sex. Similar students in subgroups may

be less suitable to help each other, as they likely seek solutions for similar problems. For example, students in subgroups of lower achievers may all need help with mathematics. Contact with dissimilar others may, however, bring them in contact with peers having complementary characteristics (e.g., high achievement). These peers may, through their complementarity, be better able to tackle their problems. As such, a less socially segmented classroom help network may more easily bring help seekers in contact with suitable help providers. However, in contrast, some research suggests that achievement flourishes in classrooms where students tend to hang out with a specific set of classmates (Berger, Alcalay, Torretti, & Milicic, 2011). Perhaps, in segmented classrooms in which students focus only on their own group of (similar) helpers, students develop more high-quality help relationships in which respect and trust are more deeply engrained. This could benefit achievement more than having superficial help relationships with many classmates. Future research may provide more insight into these contrasting findings, and investigate in more detail in what way segmentation may hamper or contribute to students' achievement.

Contrary to our expectations, we did not find an association between the proportion of isolates, i.e., students in the classroom that were not involved in giving and receiving help, and achievement. Our expectation followed from previous empirical findings, showing that marginalization of students in the classroom, specifically bullying, also affected the wellbeing of other students in the classroom, irrespective of whether these students were bullied themselves (Huitsing, Veenstra, Sainio, & Salmivalli, 2012; Meilstrup et al., 2015; Modin & Östberg, 2009). It might be that marginalization from positive social relations, such as help, is less noticeable than marginalization in a negative network, such as bullying – bullying arguably is more visible behavior that might affect feelings of safety of all. In addition, statistically speaking, effects of isolation were challenging to detect, as there simply were not many students who were isolated from the helping network.

Taken together, only inequality in the helping network was associated with academic achievement. Future research should assess in more detail why inequality in social relations is so consistently related to adverse student outcomes across studies; and should assess in more detail how cohesion and segmentation in social networks is associated with adjustment. In addition, we assumed that cohesion, equality, and low segmentation were all reflective of a positive classroom social climate, fostering academic achievement. However, the indices were not consistently related to achievement, stressing the need to examine what structure of social relations constitutes a beneficial social climate; and which individual and contextual processes precede the classroom social structure.

For educational practice, the finding that inequality hampers achievement would imply that teachers should intervene in a classroom in such a way that help relations become more equally distributed. Perhaps, this idea can be integrated in peer tutoring interventions in which students are grouped together to mentor each other in their

school motivation and achievement (e.g., Aronson & Patnoe, 2011; Slavin, 1996). In the consideration whom to group with whom, the distribution of social relations might be taken into account. As noted, however, teachers' grouping arrangement may be detrimental to classroom climate (Gest & Rodkin, 2011), underlining the importance to also take into account students' preferences regarding giving and receiving help from classmates.

ASSOCIATIONS OF INDIVIDUAL NETWORK POSITION WITH ACHIEVEMENT

Apart from characteristics of the classroom help network, we investigated associations between individual position in the help network and achievement. Particularly, we hypothesized that achievement was higher for individuals that were in the position to reach many helpers – not only directly, but also through indirect help relations with classmates (Cadima, Ojeda, & Monguet, 2012; Osterman, 2000; Wentzel & Caldwell, 1997).

Our results suggested that the number of helpers and isolation from the help network did not affect achievement. Centrality, however, seemed to positively affect achievement, although statistical support for this finding was weak. Thus, it did not matter for achievement whether students were helped by many classmates directly, but it might matter whether students can easily access potential helpers in the classroom through other classmates. This might be reflective of indirect help relations as instrumental for reaching academic goals; direct help relations might be more intimate, and may matter more for mental wellbeing rather than achievement (Cadima et al., 2012).

Whereas null findings regarding individual network position contrasted with our expectations, there is some research that ties in with these results: For example, no association was found between the number of peers students mentioned as academic advisor and achievement (Lomi, Snijders, Steglich, & Torló, 2011). What is more, 'neglected' students, i.e., students who were not involved in positive nor negative social relations in the classroom, performed quite well in school (Wentzel & Asher, 1995). The absence of associations between individual network position and achievement suggests that other individual characteristics, such as academic self-efficacy, might be more salient for the prediction of achievement than students' individual help connections.

In conclusion: At the classroom level as well as individual level, the number of help relations does not affect achievement. Also, it does not matter for achievement whether students limit their help interactions to a specific set of peers. Of importance for academic success is that help relations in the classroom are equally distributed, and, potentially, that individuals can easily access classmates for help.

LIMITATIONS, STRENGTHS, AND DIRECTIONS FOR FUTURE RESEARCH

The following limitations to this study should be taken into account when interpreting the results. First, we assessed the effect of help in a broad sense (i.e., help with homework, with repairing a flat tire, or when feeling down) on achievement in a narrow sense (i.e., school

grades). A social network structure assessed with peer nominations for more specific instances of help, for example, help with school assignments, would have likely related more clearly to academic achievement. Yet, our measure of help aligned with our aim to capture the general tendency of student to help each other, and herewith a supportive classroom climate. Also, our broad definition of help, suggesting that everybody once in a while will need some help, aimed to minimize the role that the need for and ability to help may have otherwise played in explaining the structure of the help network.

Second, we could not study the influence of network structure and individual network position on academic achievement in a longitudinal framework. Importantly, individual social relationships are subject to change, and may as such change the position of individuals, and the structure of the network as a whole. Previous research among early adolescents demonstrated that there is turnover in whom individuals mention as best friends at the beginning and end of already a three-week period (Cairns, Leung, Buchanan, & Cairns, 1995). The turnover in help, showing less stability than friendships (Van Rijsewijk et al., 2016) might be even higher. Therefore, to obtain a more detailed view of the co-evolution of networks and (school) outcomes, future research should consider including multiple measurements with short term intervals of networks and focal outcomes.

Furthermore, the focus of this study was on the classroom social climate as captured by peer relations. Importantly, however, the teacher plays a significant role in shaping the classroom climate and academic achievement as well (Fraser, Anderson, & Walberg, 1984; Walberg & Greenberg, 1997). Future research should get more insight in the feedback processes between teachers, the structure of classroom social networks, and academic achievement. For example, features of networks may improve teachers' ability to teach or manage the classroom, or particular teaching practices may alter the structure of the network, which may subsequently affect achievement.

Finally, although the strength of this paper is that we looked explicitly at help relations to capture a supportive classroom climate, these help relations overlap with other social relationships, such as friendship, that contribute to the classroom social climate (Bukowski, Hoza, & Boivin, 1994; Parker & Asher, 1993). Future studies might further investigate the extent to which classroom level network patterns overlap, and investigate how the dynamics of multiple networks shape the classroom social climate, and subsequently affect adjustment. For example, researchers might examine whether students in classroom limit the exchange of help to friends or whether help extends beyond the borders of friendship, and whether this affects school and other outcomes.

In spite of its limitations, this study has moved the field on classroom climate forward by being the first to examine the structure of classroom help networks, individual positions in these networks, and their associations with achievement in a large sample of adolescents. Remarkably, the results demonstrated that quite subtle network processes (equality, potentially centrality) were nevertheless relevant for academic success. What is more, classroom network characteristics appeared highly important for explaining classroom-level variation in academic achievement.

Social network information, as used in this study and previous studies, has proven useful to predict academic achievement among adolescents. Given that it is difficult for teachers to gain overview of all social relations in the classroom (e.g., Hoffman, Hamm, & Farmer, 2015), and given the complexity of the structure of social relations within and across different classrooms, teachers might benefit from the information offered by social networks, giving them a basis to start improving the social environment and achievement of their students.

4

Help networks and achievement

Chapter 5

Consequences of receiving peer help for depressive symptoms in adolescents

In this study, we examined processes of social influence on depressive symptoms emerging from help relations of adolescents with their classmates. Specifically, it was expected that depressive symptoms ameliorate when one's helpers exhibit less symptoms of depression, but may worsen if one's helpers are depressed. Help was assessed by asking 1,623 adolescents (*M* age = 13.1) about which classmates help them with problems. The co-evolution of these help relations and depressive symptoms was assessed across three waves using longitudinal social network analyses in RSiena. Results suggested that depressed adolescents initiate and terminate help relations more often, that depressed adolescents are more often maintained as helpers, and that similarity in depression led to maintenance of help relations. It was also found that giving help decreased depressive symptoms. Unexpectedly, one's depressive symptoms decreased if one's helpers had higher levels of depressive symptoms, suggesting a downward comparison effect. Implications of these findings are discussed.

Adolescence is a critical period in life in which many changes take place in the biological, cognitive, and social domain. Not surprisingly, adolescents are exceptionally vulnerable to developing internalizing problems (Ge, Lorenz, Conger, Elder, & Simons, 1994; Hankin et al., 1998). Suffering from internalizing problems, such as depression, can heavily interfere with the developmental tasks that adolescents need to fulfill, such as achieving well in school (Riglin, Petrides, Frederickson, & Rice, 2014) and making friends (Agoston & Rudolph, 2013; Krygsman & Vaillancourt, 2017). Importantly, adolescents have a social support network helping them to deal with depressive symptoms, including parents, teachers, or professionals. Increasingly, however, adolescents turn to their peers for help. As adolescents spend a large portion of the day in the presence of their peers at school, and as peers may experience similar developmental challenges, they are a significant and valuable source of support, taking up a central role in adolescents' help network (Helsen, Vollebergh, & Meeus, 2000; Hombrados-Mendienta, Gomez-Jacinto, Dominguez-Fuentes, Garcia-Leive, & Castro-Travé. 2012; Del Valle, Bravo, & López, 2010).

The goal of this study is to examine whether being helped by peers can counter the development of depressive symptoms in adolescents. Specifically, we track the development of depressive symptoms in the receiver of help, to examine whether receiving help ameliorates depressive symptoms. Our research aligns with studies examining peer socialization, a tendency of connected peers to become behaviorally similar due to influence processes (Prinstein & Dodge, 2008). During the past decade, longitudinal social network models have been developed that opened up possibilities to examine the interplay between peer relations and behaviors (Burk, Steglich, & Snijders, 2007; Snijders, 2001). Many researchers adopted this method to investigate peer influence processes regarding, amongst others, risk behaviors and internalizing symptoms, demonstrating that adolescents adjust their behavior to their friends' behavior (Veenstra, Dijkstra, Steglich, & Van Zalk, 2013). However, the vast majority of studies examined influence within friendships. Although behavioral change may indeed be the consequence of interactions with friends, friends do not (always) have the explicit intention to elicit behavioral change. Surprisingly, interactions with such intentions, such as help, have not been examined in the context of peer influence (see for an exception: Lomi, Snijders, Steglich & Torló, 2011).

Depression socialization has also been particularly examined in the context of friendships. In general, it has been shown that adolescents tend to become similar to their friends in their level of depressive symptoms (Giletta et al., 2011; Kiuru, Burk, Laursen, Nurmi, & Salmela-Aro, 2012). For example, adolescents with friends suffering from depressive symptoms were more likely to show elevated levels of depression themselves (Brendgen, Lamarche, Wanner, & Vitaro, 2010; Conway, Rancourt, Adelman, Burk, & Prinstein, 2011). Relatedly, friends' depressive symptoms were associated with increases in adolescents' self-injury (Giletta et al., 2012).

Co-rumination has been proposed as an underlying mechanism that explains

how adolescents may 'contaminate' each other with depressive symptoms (Rose, 2002; Schwartz-Mette & Rose, 2012; Stone, Hankin, Gibb, & Abela, 2011). Rumination within the context of depressive symptoms has been defined as recurrent thinking, mostly negative thinking, centered around a theme, sometimes in absence of cues that provoke this thinking (Mor & Winquist, 2002; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Specifically, ruminating adolescents may fixate on (their role in) the causes and consequences of a particular incident, or speculate excessively on how they are feeling and why this is the case. Co-rumination, then, occurs when peers respond to each other's problem talk with speculation about the problem or rehashing the problem, encouragement of problem talk, and dwelling on negative feelings (Rose, 2002; Rose, Schwartz-Mette, Glick, Smith, & Luebbe, 2014). Rehashing and speculating about problems has, however, been found to be an ineffective strategy to lift one's mood, as it, amongst others, '*makes thinking more pessimistic and fatalistic*' (Nolen-Hoeksema et al., 2008, pp. 401; see also Li, Starr, & Hershenberg, 2017). As such, a vicious cycle may arise in which negative thinking and depressive mood alternately trigger each other, and affect the thinking and mood of the peer.

In particular supportive social environments have found to be breeding grounds for co-rumination (Calmes & Roberts, 2008; Giletta et al., 2012; Rose, 2002; Rose, Carlson, & Waller, 2007; Rose et al., 2014). Arguably, supportive peers do not reject each other following ruminative disclosure, creating a safe environment in which rumination is accepted and stimulated (Rose et al., 2014). As such, paradoxically, supportive social contexts may form a risk for the development of depressive symptoms.

At the same time, support may buffer against the development of internalizing problems. This has particularly been examined in the context of experiencing distressing events. For example, the presence of supportive friends protects victimized children from developing internalizing problems (Hodges, Boivin, Vitaro, & Bukowski, 1999; Prinstein, Boergers, & Vernberg, 2001; Waldrip, Malcolm, & Jensen-Campbell, 2008), and negative experiences have a lower impact on adolescents' self-worth when they occur in the presence of a friend (Adams, Santo, & Bukowski, 2011). Contrary to co-rumination findings, these results seem to suggest that help from peers aids adolescents to cope with stressful events, and to regulate negative emotions effectively. Moreover, the finding that adolescents adjust their level of depressive symptoms to that of their peers does not necessarily mean that they fall into a downward spiral of aggravating symptoms – the spiral might also go upward; depressive symptoms may ameliorate (Giletta, 2011; Kiuru et al., 2012). Arguably, whether help forms a buffer or risk for the development of depressive symptoms might depend on characteristics of the giver of support.

The spiral likely goes downward if helpers suffer from depressive symptoms themselves. Indeed, although adolescents all engage in problem talk, adolescents with clinical depression (Waller, Silk, Stone, & Dahl, 2014) and internalizing symptoms (Hankin, Stone, & Wright, 2010; Nezu, 1987; Rose et al., 2007; Rose et al., 2017) are more likely to co-ruminate and less likely to engage in more productive forms of addressing problems,

such as thinking of ways to improve a situation. Thus, although peers' encouragement to talk about problems might be perceived as supportive behavior, a depressed peer may actually reinforce negative thinking and intensify internalizing symptoms (Starr, 2015). Consequently, the protective effect of help may disappear (see Hodges et al., 1997). As such, it is expected that receiving help from peers that have depressive symptoms increases symptoms in the focal adolescent, and that receiving help from peers who do not have depressive symptoms decreases symptoms in the focal adolescent.

METHODS

PROCEDURE

We use data from the SNARE-project (*Social Network Analysis of Risk behavior in Early adolescence*; see Dijkstra et al., 2015), a study aimed at investigating the social and behavioral development among (early) adolescents. Prior to the data collection, all eligible students and their parents received an information letter, in which they were asked to participate. If students wished to refrain from participation, or if their parents disagreed with their children's participation, they were requested to send a reply card or email within ten days. We emphasized during every assessment that participation was anonymous and could be terminated at any point in time. The SNARE study has been approved by the ethics committee of one of the participating universities. During the assessments, a teacher and research assistant(s) were present. The research assistant gave a brief introduction, and the students then filled in the questionnaire on the computer during class. The assessment of the questionnaires took place during regular school hours within approximately 45 minutes. The students who were absent that day were, if possible, assessed within a month.

PARTICIPANTS

We examined the networks of all first and second grade classrooms of secondary school participating in the SNARE study. For this study, we used the help networks and depressive symptoms as assessed in October 2011, December 2011, and April 2012 (referred to as wave 1, wave 2, and wave 3, respectively). Originally, the sample contained 80 classrooms. However, seven classrooms could not be analyzed due to convergence problems. Thus, in total, the study sample contained 73 classrooms (*M* classroom size = 22.2 students, *SD* = 4.7) and 1,623 students (*M* age = 13.1 years, *SD* = 0.7, 49.7% boys, 82.3% Dutch) at wave 1. Students had, on average, a slightly lower SES than the average Dutch SES. At the respective waves, 32, 54, and 51 students were absent, and their outgoing help nominations and information on depressive symptoms were missing. However, their incoming help nominations were retained. Furthermore, some participants named (almost) everyone in their classroom as helper, whereas they hardly named anyone at the preceding and/or next assessment. Also, their help nominations were hardly or not reciprocated. These extreme (out)degree outliers may have interpreted the question

differently from their classmates. We recoded their outgoing nominations as missing. This was the case for 11, 11, and 18 participants on the three respective waves. Their incoming nominations were retained. Similar strategies to handle extreme outdegree outliers have been used in previous research (e.g., Light, Greenan, Rusby, Nies, & Snijders, 2013).

MEASURES

Participants could nominate an unlimited number of same- or cross-sex classmates for a large set of peer nomination questions. To assess help, we used the question '*who helps you with problems (for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down)?*'. Similar peer nomination questions were used in previous studies investigating adolescent help relations (e.g., Baerveldt, Van Duijn, Vermeij, & Van Hemert, 2004; Dijkstra, Lindenberg, Verhulst, Ormel, & Veenstra, 2009).

Depressive symptoms at all waves were assessed using three items from a self-report scale on depression (based on Kandel & Davies, 1982). The internal consistency of these three items was α = .82 or higher for each wave. Participants were asked how often during the preceding month they felt unhappy, miserable, and down; felt nervous and tense; and worried too much. The items were rated on a 5-point scale ranging from *never* (1) *almost never* (2) *sometimes* (3) *often* (4) to *always* (5). Scores on the items were averaged to obtain mean level of symptoms for every participant. As behavioral data with a small number of categories is preferred (Ripley, Snijders, Boda, Vörös, & Preciado, 2018), we recoded mean levels of depressive symptom scores to discrete values 1 to 5 (see Table 5.1).

Help is an important feature of friendships, and friends are often nominated as helpers (Furman & Burhmester, 1992; Newcomb & Bagwell, 1995; Van Rijsewijk et al., 2016). Furthermore, having friends is negatively associated with the development of depressive symptoms (see Brendgen et al., 2010). Therefore, friendship was included in the models as factor playing a role in the development of help relations and depressive symptoms. Friendship at all waves was based on a peer nomination question, for which students could nominate an unlimited number of same- and cross-sex classmates for the

Table 5.1
Category specification of depressive symptoms and frequency of this category at each wave (%)

Category	Original value range	Wave 1	Wave 2	Wave 3
1	1.00	18.8	22.2	19.9
2	1.01 - 2.00	37.5	34.9	34.8
3	2.01 - 3.00	30.4	29.1	29.8
4	3.01 - 4.00	12.0	11.5	12.6
5	4.01 - 5.00	1.4	2.3	2.9
Total *N* students		1528	1555	1550

question '*who are your best friends*'.

Sex was measured at wave 1, and was coded 0 for girls and 1 for boys.

ANALYTICAL STRATEGY

To analyze the co-evolution of help relationships and depressive symptoms, we used the Simulation Investigation for Empirical Network Analyses software package in R (RSienaTest version 1.2.5; Ripley et al., 2018); software instantiating stochastic actor-based statistical models of social network dynamics (Snijders, 2001; Snijders, Van de Bunt, & Steglich, 2010). The model interprets the change in patterns of helping and depressive symptoms as the result of a series of unobserved, smallest possible changes taking place between observation moments. A smallest possible change is either the termination of an existing relation between two participants, the creation of a new one, or a one-unit change on the score on depressive symptoms. The probability of network and behavioral changes is modelled by an objective function, expressing under which conditions participants initiate, maintain, or dissolve a help relation, or change or remain stable in their level of depressive symptoms. The parameters in the model (see Model specification) express these different conditions. Estimates are obtained in an iterative Monte-Carlo procedure, alternating until convergence between the sampling of network change sequences (based on the model parameters), and the updating of model parameters is reached.

To achieve high statistical power while sufficiently accounting for between-classroom heterogeneity, a random effects model was estimated (i.e., Bayesian longitudinal social network analysis; Ripley et al., 2018). All variables were allowed to vary randomly between classrooms. In short, Bayesian inference assigns a prior probability distribution to the parameters which is, in the light of new data, updated to a posterior probability. The posterior probability density is proportional to the product of the prior density and the likelihood of the data. Computations are made by Markov Chain Monte Carlo algorithms (Koskinen & Snijders 2007; 2018; Ripley et al., 2018).

For all parameters we give the posterior mean (m), the posterior across-classroom standard deviation (sd), and the posterior probability p that the parameter is greater than 0.

Model specification: Help network dynamics. In the stochastic actor-oriented model, parameters can be either rate parameters or parameters in the objective function. Rate parameters for help network dynamics refer to the rate of change in network relations between time points of observations. The objective function determines the probabilities of tie creation and tie maintenance. For some effects, parameters for creation of new ties and maintenance of existing ties are equal, and are called evaluation parameters; in order to gain deeper insight into the effect of depressive symptoms on help they are distinguished, and called creation parameters and maintenance parameters, respectively. To model the dynamics of the help network, we included the most basic structural effects in the objective function, and controlled for the main effect of sex and friendship. As these are not the focus of our analyses, we refer to Table 5.2 for an explanation of these

effects. The effects of depressive symptoms on help were included as so-called ego, alter, and ego×alter effects. The ego effects capture the effect of symptoms on initiating or maintaining help relations with others. The alter effects capture the effect of symptoms on receiving new or existing nominations as helper. The ego×alter effect captures the tendency to initiate or maintain help relations with others who are similar on symptoms.

Table 5.2
Explanation of effects in the RSiena model

Effect	Effect name	Explanation
Help dynamics		
Outdegree	`density`	Tendency to nominate others as helper
Reciprocity	`recip`	Tendency to reciprocate help
Transitive triplets	`transTrip`	Tendency to have ties with helpers-of-helpers
Transitive reciprocated triplets	`transRecTrip`	Tendency to have reciprocated ties with helpers-of-helpers
Three cycles	`cycle3`	Tendency to have ties with those whom perceive ego as helper-of-helper
Outdegree activity	`outAct`	Tendency of actors with already high outdegrees to send extra nominations
Indegree activity	`inAct`	Tendency of actors with already high indegrees to send extra nominations
Indegree popularity	`inPop`	Tendency of actors with already high indegrees to attract extra nominations
Friendship	`X`	Tendency to send a help nomination to those to whom one sends a friendship nomination
Ego effect	`egoX`	Tendency of actors with higher values on X to create and maintain a higher number of help relations
Alter effect	`altX`	Tendency of actors with higher values on X to be nominated as helper more often and be maintained as helper more often
Similarity effect	`sameX / ego×altX`	Tendency for relations to be created and maintained more often between actors with the same (sex) or similar (depressive symptoms) values on X
Depressive symptoms dynamics		
Outdegree	`outdeg`	Effect of nominating helpers on depressive symptoms
Indegree	`indeg`	Effect of receiving nominations as helper on depressive symptoms
Average alter effect	`avAlt`	The tendency of students to adjust their level of symptoms to that of their helpers
Covariate effect	`effFrom`	Main effect of a covariate (sex, number of friendships) on depressive symptoms

Model specification: Depressive symptoms dynamics. To model the dynamics in depressive symptoms, we included the following parameters: Rate parameters indicate the rate of change in students' depressive symptoms between the waves. The objective function determines the probabilities of increasing or decreasing one unit in depressive symptoms, or remaining stable. To model changes in depressive symptoms, we included the indegree and outdegree effect, capturing the tendency of students who give help or receive help from more classmates, respectively, to change their value for depressive symptoms. We also included the average alter effect, expressing the tendency of students to adjust their symptoms to that of their helpers. We did not distinguish between creation and maintenance here, as there is no empirical research demonstrating how these effects should be interpreted regarding behavior dynamics (see for an exception Haas & Schaefer, 2014 using the total similarity effect). As such, we included these effects using the evaluation function. Finally, we controlled for the overall distributional linear/quadratic shape of depressive symptoms, and for the main effect of students' sex and number of friends on depressive symptoms.

RESULTS

DESCRIPTIVE STATISTICS

Descriptive statistics of the sample, help networks, and depressive symptoms are presented in Table 5.3.

Help network. The average outdegree demonstrates that students mentioned two to three classmates as helpers on average. The help network was quite sparse, as the density was about 13% across waves, meaning that 13% of possible help relations were actual relations. Furthermore, about half of all help relations were reciprocal (reciprocity), and help relations tended to cluster in groups (transitivity). The majority of help nominations (about 81-83%) were between classmates of the same sex (sex homophily). Lastly, most students tended to nominate different helpers over time, as 62%-65% of the nominations were new or were terminated between the waves (distance). To be able to perform longitudinal social network analyses, however, a sufficient fraction of help nominations should remain stable (Jaccard index). About 35-38% of nominations were stable in between waves. Given that a Jaccard index of above 30% is recommended (Veenstra & Steglich, 2012), the stability of the help networks was sufficient.

Depressive symptoms. Table 5.3 shows that students on average scored around 2.40 (*SD* = 1.01) on depressive symptoms across waves, indicating that students in general experienced depressive symptoms sometimes. In addition, there was about 40% stability in depressive symptoms and 60% change. Table 5.4 provides a more detailed image of changes, and shows that changes primarily relate to students who experienced depressive symptoms (almost) never or sometimes (scores 1, 2, and 3). They usually moved up one category at the next wave. The majority of students who experienced depressive

Table 5.3
Sample description and descriptive statistics of the help networks and depressive symptoms

Sample			
	Wave 1	Wave 2	Wave 3
Sample size	1623	1627	1626
N classrooms	73	73	73
M class size	22.23	22.29	22.27
SD class size	4.73	4.66	4.57
M age	13.06	13.21	13.55
SD age	0.72	0.71	0.72
% boys	49.66	49.57	49.50
N absent students	32	54	51

Help				Depressive symptoms			
	Wave 1	Wave 2	Wave 3		Wave 1	Wave 2	Wave 3
N ties[a]	4498	4607	4205	M	2.40	2.37	2.44
M outdegree[a]	2.56	2.63	2.42	SD (M)	.97	1.02	1.04
SD outdegree[a]	2.96	3.10	2.72	Minimum	1	1	1
SD indegree[a]	1.72	1.68	1.69	Maximum	5	5	5
% density[a]	13.1	13.5	12.5	Moran's I	−.03	.00	−.01
% reciprocity[a]	46.3	43.2	43.7	SD (I)	.12	.19	.17
% transitivity[a]	54.3	51.2	52.0				
% same-sex[a]	81.1	82.8	82.5				

Changes in help				Changes in depressive symptoms		
	1[b]	2[b]			1[b]	2[b]
N 0- 1[a]	29	25		N steps down	461	498
N 1- 0[a]	26	29		N steps up	501	581
N 1- 1[a]	33	30		N steps stable	694	631
% jaccard index	37.6	35.5				
% distance	62.4	64.5				

Note: [a] averaged over number of classrooms [b] 1 and 2 refer to the transition between wave 1 and 2, and wave 2 and 3, respectively.

Table 5.4

Change matrix presenting students' changes in depressive symptoms between wave 1 and 2, and between wave 2 and 3

		Depressive symptoms wave 2				
		1	2	3	4	5
	1	230	127	43	5	1
	2	87	335	150	19	0
Depressive symptoms wave 1	3	28	148	268	66	4
	4	4	16	68	146	7
	5	4	4	9	12	80
		Depressive symptoms wave 3				
		1	2	3	4	5
	1	200	98	39	13	5
	2	117	320	146	44	2
Depressive symptoms wave 2	3	40	139	266	63	11
	4	7	24	64	133	21
	5	3	1	2	10	77

Note. Changes refer to changes on the recoded scale of depressive symptoms as explained in the 'Measures' section.

symptoms often or always remained stable in their level of depressive symptoms across waves.

To get an indication of depression similarity between nominators and nominees, we present Moran's *I*, a measure of spatial autocorrelation assessing the extent to which receivers and givers of help are similar with respect to depressive symptoms. Values range from −1 to +1. Values close to 0 represent perfect independence, and values close to −1 or +1 represent perfect dependence, respectively. Although the majority of classrooms had a Moran's *I* close to zero (−.02 to −.03 across waves), there was large variation between classrooms (it ranged from −.5 to 1). To understand similarity between connected students, differences between adolescents and their helpers are presented in Table 5.5. Because the results did not show remarkable differences between waves, we averaged the percentages over the waves. Results show that the vast majority of helpers and receivers of help showed differences of up until 1 or 2 in absolute value. Differences larger than 2 were very scarce. This indicates that receivers are quite similar to their givers with regards to depressive symptoms, pointing towards possible selection similarity and/ or influence effects.

RSIENA RESULTS

Help network dynamics. Structural network effects as well as effects of depressive symptoms on the help networks are presented in the top part of Table 5.6. Concerning the creation of new help relations, results indicate that depressed adolescents nominate more new helpers (positive ego effect; $m = 1.68$, $sd = 0.27$, $p > .99$). However, depressive

Table 5.5
Frequency (%) of differences in depressive symptoms scores between receivers and the average score of their givers

Size of difference	%
−4.00 to −3.01	0.2
−3.00 to −2.01	1.6
−2.00 to −1.01	12.0
−1.00 to 1.00	71.2
1.01 to 2.00	12.4
2.01 to 3.00	2.3
3.01 to 4.00	0.4

Note: As frequency percentages were similar across waves, the table presents averages across waves.

symptoms do not affect being nominated for giving help (alter effect; $m = -0.01$, $sd = 0.10$, $p = .46$), and depressed adolescents do not selectively initiate new help relations with other depressed adolescents (ego×alter creation effect; $m = -0.00$, $sd = 0.12$, $p = .49$). Concerning the maintenance of existing help relations, we find that depressed adolescents discontinue nominating the same helpers (negative ego effect; $m = -1.77$, $sd = 0.47$, $p < .01$). Furthermore, we find that depressed adolescents are maintained as helpers more often (positive alter effect; $m = 0.34$, $sd = 0.17$, $p > .99$) and that depressed adolescents maintain help relations with other depressed adolescents (positive ego×alter effect; $m = 1.25$, $sd = 0.36$, $p > .99$).

Depressive symptoms dynamics. Effects of the help network on depressive symptoms can be found in the bottom part of Table 5.6. Results suggest that the number of classmates adolescents nominate as helper do not affect depressive symptoms over time (outdegree effect; $m = -0.01$, $sd = 0.18$, $p = .48$), and that adolescents who receive more nominations for giving help have less depressive symptoms over time (negative indegree effect; $m = -0.43$, $sd = 0.21$, $p = .02$). Finally, over time, depressive symptoms become lower the more depressive symptoms one's helpers have (negative average alter effect; $m = -4.26$, $sd = 0.74$, $p < .01$).

DISCUSSION

This study is the first to examine processes of social influence on depressive symptoms emerging from help relations among adolescents with their classmates. Specifically, the aim of this study was to examine how receiving help from classmates affects depressive symptoms in adolescents. We expected depressive symptoms in receivers of help to ameliorate when one's helpers have lower levels of depressive symptoms, and worsen if one's helpers have higher levels of symptoms.

Table 5.6
RSiena results on the effects of help on depressive symptoms and vice versa (*N* = 73 classrooms)

	Random effects		
	m	*SD*(*m*)	*p*
Network dynamics: Help			
Outdegree (density)	−2.18	0.19	< .01
Reciprocity	1.89	0.14	> .99
Transitive triplets	0.77	0.10	> .99
Transitive reciprocated triplets	−0.29	0.12	.01
Three cycles	−0.27	0.11	.01
Indegree popularity	−0.12	0.08	.07
Outdegree activity	0.06	0.08	.81
Indegree activity	−0.56	0.12	< .01
Sex ego	−0.48	0.17	< .01
Sex alter	−0.10	0.11	.18
Same sex	0.86	0.11	> .99
Nominating as friend	1.51	0.11	> .99
Nominating new helpers			
Depressive symptoms ego	1.68	0.27	> .99
Depressive symptoms alter	−0.01	0.10	.46
Depressive symptoms ego×alter	−0.00	0.12	.49
Maintaining existing helpers			
Depressive symptoms ego	−1.77	0.47	< .01
Depressive symptoms alter	0.34	0.17	> .99
Depressive symptoms ego×alter	1.25	0.36	> .99
Behavior dynamics: Depressive symptoms			
Linear shape	1.06	0.30	> .99
Quadratic shape	−1.16	0.13	< .01
Sex	−2.61	0.34	< .01
Number of friends	−0.00	0.09	.47
Help outdegree	−0.01	0.18	.48
Help indegree	−0.43	0.21	.02
Average depressive symptoms of helpers	−4.26	0.74	< .01

Note. The table presents posterior means and standard deviations *SD* for the random parameters *m*, and the estimated posterior probability *p* that the parameter is greater than 0.

Counter to our expectations, we found a negative influence effect, meaning that depressive symptoms tended to decrease when one's helpers were depressed. A straightforward explanation would be that depressed helpers are better helpers, were it not for the body of research indicating that depressed adolescents tend to employ less appropriate problem-solving strategies, such as rumination or talking about problems without offering solutions (Hankin et al., 2010; Nezu, 1987; Rose et al., 2007; Rose et al, 2017; Waller et al., 2014). However, in our study, there were only some adolescents who frequently or always felt depressed (about 13%), whereas in other studies clinical depression was assessed (Waller et al., 2014), or as much as 20 to 25% of the sample met the 'clinical' cut-off point of depressive symptoms (Hankin et al., 2010; Rose et al., 2017). As such, it might be that adolescents in our sample, who generally experienced mild symptoms of depression, did not ruminate as much as adolescents in other samples. Therefore, it might be that depressed adolescents in our sample were better suited to provide support in comparison to peers who do not experience depressive symptoms; experiencing depressive symptoms might increase the ability to empathize with peers who feel the same way, and give the receiver of support a feeling of being understood (McPherson, Smith-Lovin, & Cook, 2001).

The negative influence effect could also reflect downward social comparison (Festinger, 1954; Gerber, Wheeler, & Suls, 2018; Wills, 1981), meaning that adolescents compare themselves with peers who are relatively worse off. This may improve their own well-being by boosting one's self-esteem or self-evaluation (Wood, 1989). As such, being helped by peers who experience depressive symptoms may actually make depressed adolescents feel better. In a study amongst US undergraduate students, downward comparison indeed played a role in the development of depressive symptoms: Depressed students felt better after reading about others who felt very bad (Gibbons, 1986). According to another study, depressed individuals tend to avoid others who feel better and tend to inform about negative things about happy individuals (Wenzlaff & Beevers, 1998).

Importantly, descriptive findings demonstrated that adolescents in our sample who always or frequently experienced depressive symptoms were resistant to peer influence; that is, they tended to remain stable in their symptoms despite receiving help. Perhaps, adolescents suffering from mild symptoms might be more able to 'see light at the end of the tunnel', and may still be able to tackle their problems, whereas adolescents experiencing severe symptoms (e.g., always feeling miserable) may be less able to see and do so, and are stuck in a downward spiral. In such instances, perhaps only professional help may break this cycle.

Furthermore, we examined main effects of receiving and giving help on the development of depressive symptoms. Whereas the number of helpers did not affect depressive symptoms, we found that helping others decreased depressive symptoms. Perhaps, this again refers to a downward social comparison effect: Hearing about

others' problems or depressed mood may make helpers feel better about themselves. Alternatively, as peers self-disclose to helpers about their problems, helpers might become aware of the normativity of having problems, referring to that peers experience problems as well. The notion that struggling with daily hassles or having negative feelings is normative or acceptable may induce relief and temper distress. Moreover, as helpers likely aim to make their peers feel better, helping might force helpers to think about positive and productive ways to tackle problems and to put problems into perspective instead of engaging into self- or other-destructive thoughts or behaviors. As such, helping others may actually also help oneself. That is, through helping, helpers may expand their productive problem-solving skills, and may use their own advice to cope with their daily struggles. It is, thus, encouraging to find that helping others decreases depressive symptoms, and that helping others does not come at a cost to helpers' well-being (Smith & Rose, 2011; Tone & Tully, 2014).

The finding that receiving help was not associated with decreases in depressive symptoms is notable. Receiving help has many benefits, such as access to others' knowledge and skills, and receiving attention and affection, suggesting that more helpers improves access to these benefits. Future research might look into how (early) adolescents specifically exchange help. Some empirical findings suggested that early adolescents are generally not yet equipped with all necessary interpersonal problem-solving skills (Clark, MacGeorge, & Robinson, 2008). As such, the help strategies early adolescents employ might generally not be fully appropriate to tackle problems. Another explanation for this finding might be that adolescents' 'problem-disclosure skills' are still in development. That is, adolescents may not yet be able to clearly put into words whether and how problems affect their moods and what kind of support may help them deal with these problems or lift their moods. As such, it might be difficult for helpers to tailor their support to receivers' needs.

Notably, we found no association between the number of best friends and the level of depressive symptoms, which was surprising given previous findings on this association (Brendgen et al., 2010). Perhaps, this finding illustrates that it matters more whether you have best friends rather than how many best friends you have.

RESULTS ON HELP DYNAMICS

We also examined the impact of depressive symptoms on the emergence and maintenance of help relations. Findings indicated that adolescents who experience depressive symptoms more often initiate as well as terminate help relations. This high turn-over in help relations among depressed adolescents may indicate that depressed adolescents are less capable of maintaining relations with the same peer over time. It has been suggested that depressed individuals have more monotonous and less comprehensible speech, engage in unsolicited negative talk or self-disclosure, and rate their own social competencies as lower (Segrin, 2000). This may complicate their ability to maintain healthy relationships, but may also make them less attractive individuals to interact with (Schaefer, Kornienko,

& Fox, 2011). In line with this, earlier research found that depressed adolescents were less often selected and more often deselected as friends, and also tended themselves to terminate friendships more often (Van Zalk, Kerr, Branje, Stattin, & Meus, 2010).

In contrast with the finding that depressed adolescents have a higher turn-over in relations in general, we found that depressed adolescents were maintained as helper more often - despite their possible social skill deficits. Potentially, they were maintained as helper by other depressed individuals, because we also found that similarity in depressive symptoms contributes to the maintenance of help relations. We explained how depressed adolescents are potentially better able to empathize and understand their depressed peers, and are as such better suited to provide help in comparison to peers who do not experience depressive symptoms. This notion might explain the preference of adolescents to maintain depressed adolescents as helpers. It could also be a default selection effect (Deptula & Cohen, 2004; Sijtsema, Lindenberg, & Veenstra, 2010), meaning that whereas depressed adolescents may *want to* associate with non-depressed peers, they are not *able to*, given that they perceive themselves as socially less competent and are generally deemed less attractive to interact with. As a result, depressed adolescents are in a position that forces them to interact with other depressed adolescents. Indeed, depressed youth have been found to withdraw themselves from the friendship network, resulting in friendships with other (depressed) peers who are equally bad embedded in the friendship network (Schaefer, Kornienko, & Fox, 2011).

Regarding the role of depression similarity in help relations, we found that - although similarity contributed to help relation maintenance - similarity was not salient for the formation of new help relations. Although creation and maintenance effects have hitherto not been distinguished for the contribution of depression similarity to help relations, it echoes results from previous research, suggesting that some characteristics are not clearly observable, and may therefore not play a role as 'selection criterion' on the basis of which individuals establish relations (Van Duijn, Zeggelink, Huisman, Stokman, & Wasseur, 2003). Indeed, individuals tend to suppress or hide negative emotions and are less able to detect them in others (Jordan, Monin, Dweck, Lovett, John, & Gross, 2011). Importantly, this finding implies that it is relevant to distinguish between newly created relations and the maintenance of existing ones in future network studies that assess the role of selection similarity in depressive symptoms as well as other characteristics.

LIMITATIONS AND FURTHER DIRECTIONS FOR FUTURE RESEARCH

When interpreting the results, it is important to bear in mind some limitations to our study. First, the peer nomination question we used to examine who helps whom tapped into multiple types of support; not only emotional support, but also practical support. Therefore, it is not known whether helpers help their peers specifically with regards to emotional problems. As such, our results may pertain to the effects of general peer support on depressive symptoms rather than to effects of helping one another to overcome depressive symptoms or co-rumination. Future studies investigating associations of peer

help with depressive symptoms should employ a peer nomination question pinpointed at measuring emotional support. If we would have assessed help relations in such a way, we would have likely found stronger associations between receiving help and depressive symptoms.

Second, we have focused in this study on the exchange of help within the classroom, as adolescents spend much time at school in the presence of their classmates. However, adolescents' support network may also include other peers than classmates. For example, students may tell older or out-of-school peers about their problems: Adolescents may want to reveal problems to peers outside the boundaries of the classroom to minimize chances of being ridiculed or teased by peers with whom one spends most part of the day. Adolescents may also turn to other sources of support than peers, such as parents, especially when their problems take more serious forms (Sawyer et al., 2012). A fruitful avenue for future research may be to examine the role peers and parents together play in the provision of emotional support. Additionally, socialization effects emerging from relations with parents may play a role in adolescents' depressive symptoms: Indeed, whereas parental support is associated with better mental health in adolescents (e.g., Needham, 2008), at the same time, parental depressive symptoms are associated with the depressive symptoms of their children (Lewis, Neary, Polek, Flouri, & Lewis, 2017). Thus, parental depressive symptoms may mitigate the beneficial effects of support.

Third, the impact that peers' depressive symptoms may have on givers and receivers of help may differ for boys and girls. Importantly, studies found that socialization effects of depressive symptoms were more pronounced (Conway et al., 2011; Giletta, 2011) or found exclusively within girl friendships (Giletta, 2012). This may in part be explained by the finding that girls tend to engage in co-rumination more than boys do (Hankin et al., 2010; Stone, 2011). On top of that, girls are more likely to become distressed as the result of others' distress (Smith, 2015) and are generally more vulnerable to developing depressive symptoms (Hankin & Abramson, 2001; Shih, 2006). Thus, peer influence effects might differ for female helpers or receivers of help. As such, future research should address these potential sex differences.

Further potential for theory development lies in exploring the mechanisms underlying influence in help relations. As mentioned, mechanisms of friendship influence have been relatively well researched. Arguably, however, mechanisms of influence in help relations are different than those underpinning friendship influence. Common influence mechanisms refer to copying behaviors or attitudes through, for example, encouraging talk about a particular behavior (Dishion, Piehler, & Myers, 2008) or social modeling (Bandura, 1978; Brechwald & Prinstein, 2011). Influence in help relations would, however, less likely pertain to imitation, but rather to improving others' well-being. This might directly take place through the transfer of knowledge or information, addressing practical problems or improving ability. Indirectly, receiving help may contribute to feelings of being cared for and belongingness. As such, help may not address problems, yet improve one's emotional

well-being. In addition, we found that helping others also affects helpers' well-being. As such, future research may examine how help affects the receiver as well as the giver of help, and how the effectiveness of help depends on characteristics of givers, receivers, and their 'compatibility'.

CONCLUDING REMARKS

This study examined associations of peer help with depressive symptoms in adolescents, and showed that having depressed helpers may lower adolescents' depressive symptoms, suggesting a downward comparison effect. Our results also suggested that depressed adolescents initiate and terminate help relations more often, and that depressed adolescents are more often maintained as helpers. Moreover, helping peers decreases depressive symptoms, and help relations are more likely sustained if giver and receiver are similar with regard to their depressive symptoms. Future research should further specify the mechanisms and conditions underlying the ameliorating effects of giving and receiving peer help on depressive symptoms. Results suggest that peer help is beneficial for the receiver and not harmful for the giver, and that peers might be mobilized to prevent emotionally unstable adolescents from cascading into more severe internalizing problems.

Chapter 6

Conclusion: Antecedents and consequences
of helping in adolescence

AIM AND MOTIVATION OF THIS DISSERTATION

The onset of adolescence is a challenging period in life, given that adolescents face a myriad of social, cognitive, and biological developments (Steinberg & Morris, 2001). Adolescents usually do not confront these challenges on their own, but seek help from their social environment. As adolescents develop a desire for autonomy from authority figures, such as parents or teachers, the role of peers in shaping their daily lives becomes larger (Allen & Land, 1999; Berndt, 1982; Larson & Richards, 1991). As such, the role of peers in the provision of support becomes more important (Helsen, Vollebergh, & Meeus, 2000; Hombrados-Mendienta, Gomez-Jacinto, Dominguez-Fuentes, Garcia-Leive, & Castro-Travé. 2012; Del Valle, Bravo, & López, 2010).

The aim of this dissertation was to examine the role peers play in adolescents' help networks. Knowledge on this topic is quite limited: Previous research has primarily viewed help as an individual outcome and focused on explaining which adolescents tend to *give* help. However, it has been largely overlooked which adolescents typically receive help, who helps whom, and what are the consequences of giving and receiving help for adjustment. Moreover, looking at research examining the role of peers in adolescent development, the majority of studies take interest in the negative aspects of the peer context, such as the role of peers in adolescent risk-taking behaviors.

This dissertation adds to previous research by conceiving of the peer context as a positive social environment with potential beneficial effects for adolescent development. Specifically, I focused on the peer context as context for the exchange of help, benefitting from a social network approach in which help is viewed as a social relationship instead of an individual attribute. Asking a large sample of early to mid-adolescents about their helpers in the classroom ('*who helps you with problems [for example, with homework, with repairing a flat tire, or when you are feeling down]?*') allowed me to answer questions on the identity of help givers and receivers (chapter 2), on the interplay of help with friendships (chapter 3), on help network characteristics on the classroom level (chapter 4), and on the consequences of help for adjustment (chapter 4 and 5).

In the following, I will present a short summary of the main findings as well as integrate the results of the four empirical chapters. I will additionally discuss the strengths and contributions of this dissertation, and address possibilities for future inquiry into help in adolescence. Finally, I will present an overview of some practical implications.

SHORT SUMMARY OF THE MAIN FINDINGS

CHAPTER 2: WHO HELPS WHOM?

In this chapter I focused on the effects of individual characteristics (i.e., sex, academic achievement, depressive symptoms, and peer status) on receiving help and giving help, and on similarity between helpers. I found that depressed adolescents and rejected adolescents were less often mentioned as helpers, and that rejected adolescents and

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Conclusion

low achievers indicated to receive help more often. Furthermore, findings suggested that adolescents prefer help relations with similar others with regard to sex, academic achievement, depressive symptoms, and peer status.

CHAPTER 3: INTERPLAY OF HELP AND FRIENDSHIPS

In this chapter, the characteristics of help networks versus friendship networks and the interplay between these networks was examined. The latter was done by examining how one-sided and mutual nominations in the help network were related to nominations in the friendship network, and vice versa. Results illustrated that friendship and help networks show some structural network similarities (e.g., a tendency to nominate a selective set of classmates, and tendencies towards reciprocation and group-formation), but further inspection revealed that the extent to which some tendencies were expressed were stronger for friendships than for help relations: Students tended to nominate less helpers than friends, and tendencies towards reciprocation and group-formation were weaker in help networks. Moreover, friendship and help networks only partly overlapped; not all friends are helpers, and not all helpers are friends. Longitudinal multiplex social network analyses showed that mutual versus one-sided help was important for the maintenance of friendship, but not for the initiation of friendship, and that particularly mutual friendships provide a context in which help takes place.

CHAPTER 4: CLASSROOM HELP NETWORKS, INDIVIDUAL NETWORK POSITION, AND ACADEMIC ACHIEVEMENT

In this chapter I examined the structural characteristics of classroom help networks, the position individuals take up in this network, and their associations with academic achievement. Achievement was lower in classrooms where help relations were unequally distributed. The number of help relations (density) or the extent to which help was clustered in groups (segmentation) were not associated with achievement. Furthermore, results seemed to suggest that individuals who were more centrally positioned in the help network showed higher achievement, but the number of help relations they had was not related to achievement. Interestingly, classrooms varied strongly on network dimensions, and networks that would theoretically be expected to be most beneficial for achievement (with high density, few isolates, high equality, and low segmentation) were uncommon.

CHAPTER 5. CONSEQUENCES OF HELP FOR DEPRESSIVE SYMPTOMS

In chapter 5 I examined processes of social influence on depressive symptoms emerging from help relations of adolescents with their classmates. Specifically, I expected that depressive symptoms ameliorate when one's helpers exhibit less depressive symptoms, but may worsen if one's helpers are depressed. Results suggested that depressed adolescents initiate and terminate help relations more often, and that depressed adolescents are more often maintained as helpers. Giving help decreased depressive symptoms. Unexpectedly, one's depressive symptoms decreased if one's helpers had

higher levels of depressive symptoms, suggesting a downward comparison effect.

WHAT ARE THE ANTECEDENTS OF HELP?

In this dissertation, a first aim was to examine predictors of involvement in giving and receiving help. In the following subsection, I will shortly address the questions *who gives help*, *who receives help*, and *who helps whom* based on the findings from my empirical chapters, followed by a conclusion.

WHICH ADOLESCENTS ARE TYPICAL GIVERS AND RECEIVERS OF HELP?

In general, I found that experiencing problems and exchanging help was quite common. More than half of all SNARE participants reported on at least one 'unpleasant event' over a two-year period (chapter 1). Frequent unpleasant events pertained to the death or health issues of family, friends, or pets; health issues of oneself; social problems at school or within the family; and school problems. Furthermore, I found that, at each separate measurement occasion, about 77% of participants in my study reported helpers, and about 88% received at least one nomination as helper. Thus, many adolescents gave and/or received help from classmates.

Explanations for prosocial inclinations are often grounded in developmental psychology and sought in factors internal to the giver of help, such as the ability to empathize with others' feelings and needs (Eisenberg, Eggum, & Di Giunta, 2010). I aimed to explain help with factors touching upon givers' social context (Eisenberg, Spinrad, & Knafo-Noam, 2015), and took receivers' perspective as well as giver-receiver compatibility into account in explaining help.

My starting point was the notion that gaining or maintaining a favorable social status among peers is an important developmental task for adolescents (Adler & Adler, 2003; Baumeister & Leary, 1995; Ormel, Lindenberg, Steverink, & Verbrugge, 1999), and that motives to (receive) help are partly rooted in considerations regarding the social status of a potential help giver or help receiver. Moreover, I argued that similarity in characteristics would predict help relations: I linked the similarity attraction perspective, arguing that similarity increases mutual understanding about each other's problems and feelings, to a status perspective, and maintained that this understanding may decrease concerns about being rejected or ridiculed by one's helper.

From the results of this dissertation, I can conclude that status plays a role in giving and receiving help, but that this role is quite modest: Modest correlations between adolescents' characteristics and exchanging help (chapter 2) suggest that adolescents who are more involved in giving or receiving help are generally higher in peer status; they are deemed more popular by their classmates, are less rejected, and give and receive more friendship nominations. No causality claim can be made here. If giving and receiving help, however, were to be a consequence of peer status, this would imply that others' social status may in part contribute to involvement in giving and receiving help, or that

individuals who are well embedded in the peer group have the social skills that may contribute to one's ability to provide or seek help.

Longitudinal associations were, however, less coherent. As for peer status, no associations of giving and receiving help with popularity were found. Also, surprisingly, rejected adolescents tended to nominate more classmates as helpers, but, as expected, received less nominations as helper. In addition, I found that characteristics which were argued to be negatively associated with status (depressive symptoms, low academic achievement), and as such negatively with giving and receiving help, were unrelated to social status in the SNARE sample, and not consistently related to giving and receiving help (chapter 2): Lower achievement was associated with receiving help, but not with giving help, and depressed adolescents gave help less often, but no association with receiving help was found. In chapter 5, I specifically found that depressed adolescents initiate as well as terminate help relations more often, explaining the absence of an association between symptoms and receiving help in chapter 2. In addition, I found that depression contributes to being maintained as helper, but not to receiving new nominations as helper (chapter 5) countering findings from chapter 2. An explanation for these varying findings might be that the group of help givers and receivers was quite large and heterogeneous. This might explain the difficulty to characterize 'typical' givers and receivers. In addition, the broad formulation of the help question in the SNARE-study may have explained why giving and receiving help were not coherently related to specific skills or characteristics such as achievement or depressive symptoms, but more to general predictors of relationship formation, such as social standing (concurrently) and, as will be discussed below, similarity and general preferences to form relations.

To conclude, the role of status in predicting giving and receiving help is modest at best. In addition, it was difficult to obtain a clear image of which adolescents are typically involved in giving and receiving help based on the characteristics I examined. To gain more insight into the identity of help givers, future research might consider including a broader array of characteristics explaining giving help, such as personality characteristics (e.g., empathy) as well as cognitive factors (e.g., one's belief in the ability to help others) and characteristics reflecting the ability to help (e.g., being smart, creative, or resourceful). However, especially the identity of receivers of help needs more attention, as particularly little is known about adolescents who receive help. Research might also focus on factors relating to the (perceived) need for help or the willingness to receive help (see, e.g., Gulliver, Griffiths, & Christensen, 2010). Indeed, the finding that rejected and lower achievers received help more often suggest that they might have mobilized their peer network as they were in need of help.

WHO HELPS WHOM?

Generally, results suggested that adolescents tend to be selective regarding their help relations with classmates: They mention two to three classmates as helpers, which is typically less than the number of nominations adolescents list in other positive networks,

such as friendship (this dissertation, and see Veenstra, Dijkstra, Steglich, & Van Zalk, 2013). The findings from chapter 2 additionally suggest that adolescents tend to (receive) help (from) similar peers –specifically, to avoid help relations with dissimilar peers. I found this avoidance of dissimilarity for sex, depressive symptoms, peer rejection, and popularity, and for academic achievement for some part of the sample. This selectivity was also found at the classroom level: Students tend to cluster in small sub-groups of helpers. In addition, findings from chapter 5 suggest that, at least for depressive symptoms, similarity is particularly salient for the maintenance of help relationships, but is not a 'selection criterion' on the basis of which adolescents establish new help relationships. This can be explained by the notion that depression, as opposed to sex, is not clearly observable, and may as such not play a role in the establishment of new relations (see Van Duijn, Zeggelink, Huisman, Stokman, & Wasseur, 2003). This finding emphasizes the importance of distinguishing between newly created relations and the maintenance of existing ones when assessing the role of selection similarity.

The finding that students tend to prefer help relations with similar others has to be nuanced. That is, not only a preference for similar others but also influence may play a role in similarity of help relations. The first process, which was the focus of my analyses in chapter 2, refers to the notion that individuals tend to prefer relations with similar others (McPherson, Smith-Lovin, & Cook, 2001). The second process refers to the notion that individuals assimilate to the individuals they are connected with (Friedkin, 1998), which was the focus of my analyses in chapter 5. Both processes might result in the same outcome: Similarity in behaviors and characteristics between affiliated individuals. To more clearly disentangle these two processes, future studies should control for influence when studying selection and vice versa.

The results regarding who helps whom made clear that results on the individual level are more meaningful if the higher, dyadic level is taken into consideration. That is, results suggested that individuals are not helpful towards just anyone, suggesting that giving and receiving help depend on factors that reach beyond the individual. As such, help should not simply be seen as an individual, invariable characteristic, but as behavior that involves others with characteristics that matter. Taking into account the embeddedness of individuals in help relations may provide a more consistent and complete image of the mechanisms underpinning help, and does justice to the notion that help involves two (or even more) individuals.

WHO HELPS WHOM? HELP AND FRIENDSHIPS

The general tendency to be selective regarding the exchange of help was also reflected in findings regarding the overlap of friendships and help relations (chapter 3). That is, the tendency to exchange help was higher within than outside friendships. In particular, adolescents were more often helped by mutual friends than by non-friends or non-mutual friends. This was expected, and consistent with the notion that help is an important feature and expectation of (mutual) friendship (Hall, 2012; Hartup & Stevens, 1997). I

also found, however, that help was quite prominent among non-friends, and that help preceded friendship. I argued that characteristics that are typical of (mutual) friendship, such as genuine regard and trust contribute to the tendency to help. Whereas these characteristics are typical for friends, they may also be ascribed to classmates who are not regarded as friends. For example, peers' perceived trustworthiness may increase if their general status reputation, or their reputation for helping, is positively evaluated by classmates. My findings on similarity (chapter 2) may also explain why help would take place outside friendships: Similarity fosters identification and the ability to empathize with the other (Nadler, 2016; Tajfel & Turner, 1979) which may in turn facilitate help-giving. In addition, adolescents may more readily assume that someone is trustworthy if this person has similar characteristics (Singh et al., 2015), stimulating help-seeking behavior from similar rather than dissimilar classmates.

I also found that even within mutual friendships, help is not always present. Thus, adolescents mention some classmates as friends, but these friends were not always salient to them as helpers. I argued, amongst others, that help may be a less important feature of some friendships, such as the friendship between boys (Berndt, 1982; Bukowski, Newcomb, & Hoza, 1987; Hall, 2011); or that adolescents maintain friendships with different goals: Some friendship bonds are intimate and intense, whereas other peers are primarily befriended to hang out with and have fun. Of course, seeking help from friends may also depend on one's need for help with some adolescents not making use of classmates for help, but given that the vast majority of adolescents indicated to have received help, this is likely not the only explanation.

Thus, although help was found primarily within friendships, chapter 3 has also shown that help is not as inherent to friendship as has been suggested by the literature. More research is needed to identify friends who are not helpers, and helpers who are not friends.

STRUCTURAL CHARACTERISTICS OF HELP RELATIONS

A new insight provided by this dissertation is that help may be explained not only by individual characteristics or relations, but that help relations also exist because of the presence of other help relations in the network, pointing at the relevance of structural network effects. Although this was not the focus of this dissertation, I showed across all chapters that individuals were more likely to receive help from classmates they helped (reciprocity) and to receive help from helpers-of-helpers (transitivity, group-formation).

Descriptive analyses provided more insight into how help networks can be further characterized, also in comparison to other positive peer relations. I expected reciprocity rates to at least resemble reciprocity rates of other positive networks, as receiving help may induce a feeling of indebtedness, or an obligation to return help (Ackerman & Kenrick, 2008; DeCooke, 1997, Uehara, 1995). As for transitivity, it has been argued that indirect connections (e.g., the helpers of one's helpers) are deemed more trustworthy than random others (Coleman, 1988). As trust is a salient precondition for seeking help from

a particular other, I also expected transitivity rates to resemble those of friendship and liking. However, it surprisingly appeared that tendencies towards nominating classmates as helpers, to reciprocate help nominations, and help relations to cluster in groups were weaker in help networks compared to friendship and like networks (Huitsing et al., 2012; Veenstra, et al., 2013). Apparently, the antecedents of help versus other positive relations differ. I argued in chapter 2 that there are presumably more preconditions necessary for help than for friendship and liking. For example, the level of reciprocation may be lower because some students might not be able to reciprocate help (i.e., they lack the skills or knowledge to help), or students may not approach helpers-of-helpers if they are not suitable helpers for the focal adolescent.

These differences were also visible at the classroom level. That is, in classrooms in which the tendency to (mutually) help was high, the tendency to (mutually) befriend was not necessarily high (chapter 3). This is surprising, as one would expect characteristics of particular classrooms, such as classroom atmosphere or behavioral norms, to give rise to friendship and help equally. Apparently, classrooms may provide a foundation for friendship but, at the same time, not for help, or vice versa. Perhaps, in classrooms with a high focus on academic success rather than engaging in close social relations, students may be less inclined to befriend, but may still help their peers move forward academically. In short, these findings suggest that preferences for engaging in help relations and the (resulting) network structure differ from those of other positive relations, and that it may be worthwhile to further investigate help as a distinct social relationship to better understand the role of peers in adolescents' network of helpers.

STRUCTURAL CHARACTERISTICS OF THE CLASSROOM HELP NETWORK

Viewing help as a phenomenon that also manifests itself at higher levels than the individual or dyad allowed me to examine help at the classroom level. Specifically, I sought to examine how classroom help networks can be characterized. I found that classrooms varied with respect to the number of help relations, the extent to which help relations were equally distributed over students, and the extent to which the help network was segmented (i.e., clustered into sub-groups). Also, classrooms varied with respect to how these dimensions coincided: Classroom help networks showed diverging network patterns, suggesting that not only individual or dyadic characteristics may predict tendencies to help, but also aspects of the wider classroom social setting. The findings seem to be in line with previous (scarce) research noticing wide variation between classrooms regarding inequality or segmentation in adolescents' networks of positive social relations (Ahn & Rodkin, 2014; Babarro, Díaz-Aguado, Martínez Arias, & Steglich, 2017; Baerveldt & Snijders, 1994; Cappella, Kim, & Neal, 2013). There are several explanations that may clarify this variation between classrooms. These explanations were not discussed in chapter 4, but deserve consideration in future studies into classroom helping.

First, person-environment fit theory has been often used to explain behavioral variation in social settings, and maintains that individuals behave in accordance to what is

considered acceptable or normative for the social setting in which the individual resides, such as classrooms (Wright et al., 1986). Behavior is normative if it is displayed by the majority of the group (descriptive norm), or by influential, high-status group members (status norm or norm salience) (Henry, Guerra, Huesmann, Tolan, VanAcker, & Eron, 2000; Veenstra, Kreager, & Dijkstra, 2018; Wright, Giammarino, & Parad, 1986). However, it has been argued that this reasoning does not hold for prosocial behavior, such as help, as this behavior is consistently related to peer acceptance and thus normative in any group setting (Stormshak, Bierman, Bruschi, Dodge, & Coie, 1999; Wright et al., 1986). As such, according to person-environment fit theory, the tendency to help should be quite comparable among classrooms, and help should thus be 'omnipresent'. Yet, a recent study showed that the evaluation of prosocial behavior varies among classrooms (Dijkstra & Gest, 2015), and that the tendency to display prosocial behavior is stronger when other classmates or influential classmates behave prosocially (Laninga-Wijnen, Harakeh, Dijkstra, Veenstra, & Vollebergh, 2018). This dissertation also suggested that, although givers and receivers of help generally seemed higher in peer status (chapter 2), help was not common in any social setting (chapter 4). Variations in the social acceptability of this behavior may be an important contextual factor explaining variation. However, the idea that adolescents behave 'just' in response to social norms overlooks the notion that, as argued in chapter 4, adolescents additionally need to trust peers and be willing to self-disclose to peers for help to flourish in classrooms.

An approach that better corresponds to this notion pertains to the so-called classroom goal structure (Meece, Anderman, & Anderman, 2006). In literature on academic goals, a distinction is made between mastery goals and performance goals (Pintrich & Schunk, 2002). In short, mastery goals pertain to an individuals' focus on self-improvement of ability, whereas performance goals pertain to a focus on ability improvement relative to others. Different goal orientation types have been linked to differences in academic success, but are also related to social processes in the classroom. Specifically, a focus on improvement relative to others is found to inhibit students' tendency to seek help from peers on academic tasks (Middleton & Midgley, 1997; Roussel, Elliot, & Feltman, 2011; Ryan, Hicks, & Midgley, 1997; Shim, Kiefer, & Wang, 2013). Similarly, Roseth, Johnson, and Johnson (2008) showed in their meta-analysis that the presence of positive peer relations is attenuated in classrooms in which students hold an individualistic orientation (and believed that they could improve their ability regardless of others' success in ability improvement). Students in classrooms characterized by such a competitive and individualistic atmosphere are likely to be less open and trustworthy, and more focused on personal rather than other's well-being, hampering the establishment of help relations.

However, it is unclear who determines these collective goal orientations. Research found that teachers have a key role in shaping classroom goals, as they may or may not emphasize the importance of achieving high grades, or focus on either individual or group activities (Meece et al., 2006). However, the role of teachers in my research was

likely small, as students were being taught by different teachers depending on the course. As such, students in classrooms were confronted with different ways of teaching almost every hour. Thus, students in the classroom likely developed a collective goal orientation independent of their teacher, perhaps under the guidance of visible, influential peers.

Another approach that aids in explaining network differences, and has been briefly touched upon in chapter 4, refers to the 'self-organizing' capacity of social networks (Robins, 2015). This pertains to the notion that preferences for relationship formation at the individual level result in certain network structures at higher levels. Indeed, individual level tendencies to reciprocate help nominations, and to mention helpers-of-helpers as one's own helper (chapter 2, 3, 5) may have unintendedly contributed to the segmented network structure I found at the classroom level (chapter 4). These seemingly universal principles may nonetheless result in diverging classroom network patterns – as my results demonstrated, not all classrooms are segregated into groups of similar peers to the same extent. Network ecology theory (McFarland et al., 2014) emphasizes that features of the classroom context may amplify or attenuate preferences for relationship formation and, in turn, contribute to variation in characteristics of the larger network. In line with this, findings from chapter 2 demonstrated that individual tendencies towards nominating others as helper, reciprocating help nominations and nominating helpers-of-helpers as own helper vary over contexts. A contextual characteristic that pertains to variation in trust and openness, and may thus be relevant for explaining variation in help networks, is heterogeneity in the characteristics of students in a classroom (McFarland et al., 2014). First, it is argued that heterogeneity increases the opportunity for social segregation; the more common a certain attribute is (e.g., some classrooms were characterized by high percentages of Dutch or female students) the less relevant this attribute becomes for social selection. More importantly for help, however, is that heterogeneity of attributes in the social context may raise concerns and uncertainty about others' trustworthiness (McFarland et al., 2014; McPherson, Smith-Lovin, & Cook, 2001), amplifying the tendency to limit help interactions with others with whom one can more readily identify, that is, similar others (Nadler, 2016). Thus, heterogeneity may reduce feelings of trust and openness, resulting in segregated and possibly low-density help networks in which peers establish help relations with a selective set of similar classmates.

In sum, the differences I found between classroom help networks are less likely explained by traditional theoretical explanations referring to contextual processes, such as norms and teaching style. Moreover, classrooms showed very diverging network patterns, suggesting that every classroom has its own help network dynamics. Network ecology theory seems a promising avenue for future research into explaining these intricate differences: This approach acknowledges the complex interplay between individual relationship formation preferences and the role of the social context in shaping these preferences, and their subsequent impact on classroom level social structure.

CONCLUDING REMARKS ON THE ANTECEDENTS OF HELP

To summarize: It is challenging to obtain a clear image of typical givers and receivers of help, but by conceiving of help as social behavior, I demonstrated that individuals are selective with regard to their help relations: They tend to avoid to (receive) help (from) dissimilar others, and help more often takes place within rather than outside friendships. In the introduction of this dissertation, I explained that prosocial behavior (such as help) has been defined as behavior intended to benefit (relations with) others (Dovidio, Piliavin, Schroeder, & Penner, 2006; Eisenberg et al., 1999), but results from this dissertation suggest that it is behavior intended to benefit *particular* others. Furthermore, my results regarding the overlap between friendship and help and the structure of the help network at the classroom level called into question the supposed omnipresence of help within friendships and over classrooms. More insight is needed regarding which friends are also identified as helpers and which are not, which peers other than friends are helpers, and what individual and classroom characteristics may predict the wide variation in classroom help network structure. Generally, future research should take into account that help involves at least two individuals, and should always take into account *to whom* help is given when studying giving help, and *from whom* help is received when investigating receiving help. In doing so, more information is gathered as to which adolescents typically give and receive help, but also about the mechanisms underpinning giving help to or seeking help from *specific* peers, and about how help exchange on the dyadic level adds to our understanding of the emergence of help networks at the classroom level.

WHAT ARE THE CONSEQUENCES OF HELP?

Next to examining the antecedents of help relations, the second aim of this dissertation was to examine consequences of help. I examined effects of giving and receiving help at three levels – the individual, the dyad, and the classroom, on three outcomes – friendship, academic achievement, and depressive symptoms. To examine the consequences of help, I draw on the results from chapters 3, 4, and 5, in which I examined the interplay of friendship and help, the consequences of the structure of help networks and individuals network position on academic achievement, and the effects of help on depressive symptoms, respectively. I also draw on findings of chapter 2, where I discussed associations of giving and receiving help with rejection and popularity. This section will be concluded by some remarks on the consequences of help.

HELP AND SOCIAL EMBEDDEDNESS

As touched upon when discussing typical givers and receivers of help, I found some indications in chapter 2 that givers and receivers were generally better socially embedded in the peer group; not only did they give and receive more friendship nominations, they additionally seemed to be less rejected and more popular among peers. It was not entirely clear whether this social embeddedness in the peer group was a precursor or consequence

of help interactions. For rejection and popularity, longitudinal associations did not provide a decisive answer. For friendship, however, it appeared that help contributes to the initiation and maintenance of friendship (chapter 3): Indeed, adolescents were more likely to start new friendships and maintain friendships under conditions of help. I also took into account the notion that help can be mutual or one-sided, and found that particularly mutual help contributed to the maintenance of friendship. Interestingly, however, I found some indication that mutual help hampered the formation of new friendships. The combination of mutual help without any form of friendship was exceptional, however. As such, I suggested that it is not normative for peers to engage in intense, mutual help relations before having established friendship, that is, before knowing each other or feeling affection for each other. Thus, help may positively contribute to becoming friends, or positive peer relations in general, but perhaps only if it takes a form that matches with the pace in which positive relations are established: Becoming friends, for example, is a gradual process, and help may be especially beneficial for friendship if it runs parallel with the level of intensity (e.g., liking, intimacy) of the friendship.

I was surprised to find that both giving and receiving help were positively associated with friendship and social status. Although I expected that helpers were accepted among their peers, I assumed that receiving help, as an indicator of dependency and lack of knowledge or skills, would compromise one's peer status. It was encouraging to find that receivers of help were socially accepted and that seeking help was associated with the initiation and maintenance of friendships. This might indicate that experiencing problems and seeking help is quite common and that adolescents will not face social repercussions, such as decreased popularity, rejection, or friendlessness, when seeking help from their classmates. Previous research has argued that seeking help triggers worries about adolescents' own and other's perception of their social status among peers (e.g., Bohns & Flynn, 2010; Nadler, 2014, Ryan, Pintrich, & Midgley, 2001) and that this is an important barrier to seeking help. These worries are, however, not justified based on findings from this dissertation about help-seeking in the classroom context.

HELP AND ACADEMIC ACHIEVEMENT

As this dissertation focused on help in the classroom context, I examined associations of help with an outcome relevant to this context - academic achievement. I expected better achievement among adolescents who were not isolated from the help network, who reported a high number of helpers and who occupied a central position in the help network. I found that the number of helpers students report was neither beneficial nor detrimental to students' academic achievement (chapters 2 and 4). Isolation from the help network (i.e., not receiving nor giving help) was also not associated with achievement (chapter 4). However, students who were central in the network, indicating that they could reach many other classmates through few intermediate help relations, seemed to show higher achievement. In addition to the association of individual network position with achievement, I was interested in whether the structure of the classroom

help network would relate to achievement. I posited that a particular help network structure (high density, low segmentation, and low inequality) would be reflective of a more open classroom atmosphere where individuals like and trust each other, providing a foundation for academic learning (Cefai, 2004; 2007). Although density nor segmentation were associated with achievement, I found that achievement was lower in classrooms where help relations were unequally distributed - specifically, in classrooms where there were some individuals that reported relatively many helpers. I argued that the division of classrooms into 'haves' and 'have-nots' as regards access to help may lead to feelings of injustice or competition between students, undermining a positive classroom atmosphere, and hampering achievement.

The finding that hierarchy in the network hampers achievement replicated findings from previous research into the associations of network inequality with achievement (Ahn & Rodkin, 2014; Ahn, Garandeau, & Rodkin, 2011; Almquist, 2011; Babarro, Diaz-Aguado, Arias, & Steglich, 2017; Cappella, Kim, Neal, & Jackson, 2013; Östberg, 2003). However, the mechanisms underpinning this association have not been explicitly tested. More broadly speaking, there is little knowledge as to why a particular network structure would be conducive to academic learning or other student outcomes. There is a need to better understand what a particular network structure means or reflects; and how this structure might play a role in creating certain social environments or climates conducive to student adjustment. In chapter 4, I touched upon the notion that networks with a certain structure (e.g., dense networks) may facilitate trust and openness in the classroom, and highlighted a recent study demonstrating that a cohesive classroom social network indeed facilitated generalized trust of students in their fellow classmates (Van den Bos, Crone, Meuwese, & Güroğlu, 2018). Other theoretical ideas regarding implications of social network structure emphasize the benefits of cohesive but interconnected subgroups in the network for the flow of innovative information and knowledge (Watts, 1999). These theoretical ideas on network implications need further development, but particularly need to be tailored to the (early) adolescent classroom context. Social network information is deemed a promising tool that aids in the development of classroom interventions, as networks explicitly lay out the social structure of the classroom. However, how networks may be used and altered by interventions needs further theoretical substantiation.

HELP AND DEPRESSIVE SYMPTOMS

Next to the consequences of receiving help on the individual and classroom level, I examined how help affects outcomes taking into account the dyadic level at which help takes place. That is, I examined how depressive symptoms develop as a response to the depressive symptoms of one's helpers. Generally, I found that depressive symptoms decrease in adolescents who are involved in giving help but that depressive symptoms are not affected by the number of helpers; and that depressive symptoms in receivers of help tend to ameliorate when one's helpers are depressed.

Thus, surprisingly, our results seemed to suggest that having helpers with

depressive symptoms is beneficial for receivers. Contrary to previous research suggesting that depressed individuals have impaired problem-solving capacities (e.g., Nezu, 1987; Waller et al., 2014), these findings suggest that depressed adolescents are actually able to help their peers overcome depressive symptoms (but see the discussion on downward comparison in chapter 5). Supporting this interpretation is the finding that depressed classmates are maintained as helper more often (chapter 5), and seem to be preferred as helpers over non-depressed classmates. As noted, depressed classmates may be more able to empathize with and understand others who experience problems, and give receivers of their support the feeling that they are being cared for and taken seriously. These findings suggest that also non-depressed adolescents benefit from receiving help from depressed classmates, and that having *complementary* rather than *similar* characteristics or behaviors is beneficial for receivers' adjustment.

Furthermore, it was encouraging to find that helping peers was associated with decreases in depressive symptoms over time. I argued that helping others might improve one's own 'productive' problem-solving skills, and that hearing about peers' problems tempers distress, because this makes helpers aware of the notion that having problems and worrying about these problems is normative and acceptable. However, I was surprised to find that receiving help was not associated with decreases in depressive symptoms, and argued that this underlines a need to further investigate adolescents' problem-solving as well as problem-disclosure skills. Knowing more about how adolescents address problems, how they communicate about their problems, and how this affects the well-being of givers and receivers of help would provide input regarding how peers may optimally support each other, providing benefits to both givers and receivers of help.

Thus, generally, my interpretation of my findings regarding social influence through help are speculative, and need further theoretical and empirical substantiation. Specifically, it needs to be examined *why* receivers are affected by their (depressed) helpers, *why* helpers are affected by the peers they give help to, and how characteristics of givers and receivers as well as the *combination of their characteristics* shape these mutual influence processes. Indeed, as noted in chapter 5, researchers usually adopt models for the co-evolution of relations and behavior to investigate influence within friendships (Brechwald & Prinstein, 2011; Veenstra et al., 2013), also regarding depressive symptoms (e.g. Giletta et al., 2011; 2012; Schaefer, Kornienko, & Fox, 2011). Surprisingly, help, having the explicit intention to elicit behavioral change, has not been researched in the context of peer influence, and it is likely that the mechanisms underpinning influence through help differ from those in friendships.

CONCLUDING REMARKS ON THE CONSEQUENCES OF HELP

By viewing help as behavior that involves not only a help giver, but also a help receiver, this dissertation does justice to the notion that the consequences of help stretch beyond the individual who helps others. Results suggest that giving and receiving help have consequences for social embeddedness in the peer network, in particular friendship;

Conclusion

academic achievement; and depressive symptoms. Thus, help has actual consequences, and these consequences deserve consideration by future research. As the results seem to suggest that complementarity versus similarity may play a role in improving adjustment, future research might consider whether this claim is substantiated for influence processes emerging from help regarding emotional wellbeing, but also for other outcomes relating to help, such as achievement (see also Lomi, Snijders, Steglich, & Torló, 2011). Further empirical and theoretical consideration should be given to how influence processes operate in help relations versus friendship relations; which interpersonal problem-solving and problem-disclosure strategies adolescents employ; and how characteristics of givers, receivers and their compatibility contribute to positive outcomes of help.

CONTRIBUTIONS OF THIS DISSERTATION

EXPLAINING HELP AS A PHENOMENON INVOLVING MORE THAN ONE INDIVIDUAL

A first contribution of my dissertation is that I view help as a social phenomenon, specifically as a social relationship, that involves and affects two individuals – the giver and receiver of help. I also acknowledged that help is a phenomenon that operates at the group level. I explained how this has the potential of opening up a relatively underexplored area of research, as it shifts the attention from the adolescent who helps to the adolescent who receives help, to who helps whom, and to the wider social context in which help takes place. I argued that traditional explanations of help, focusing on the abilities of the helper, should be complemented by explanations focusing on the receiver of help as well as their 'match', while taking into account processes pertaining to the social context in which help takes place, such as classrooms.

The suggestions I provided for further research into help relations also pertain to other interactions that involve and affect others. For example, aggressive behavior has often been studied from an individual perspective: What makes adolescents aggressive, and how is this aggression related to (later) adjustment (Fraser, 1996)? However, aggression may be directed towards and affects others. Bullying behavior is an example of aggression that involves others, and has been examined as such (e.g., by studying who bullies whom; Huitsing & Monks, 2018). Adopting this approach provided deeper insight into manifestations of and mechanisms underlying bullying, providing a solid foundation for intervention (Salmivalli, Kärnä, & Poskiparta, 2010). Interventions aimed at promoting positive social interactions may also benefit from such an approach, as will be further explained in the section on practical implications.

INDIVIDUAL VERSUS GROUP-LEVEL DYNAMICS

A second contribution of my dissertation is that I revealed that the way in which a phenomenon operates at the individual level may contrast with the way in which it operates at the dyadic or group level. As such, dependent on the level on which a

phenomenon is studied, the phenomenon may be considered beneficial or harmful for the adjustment of individuals or groups of individuals.

For example, findings from my dissertation suggested that the majority of adolescents receives help, and that receiving help is partially independent of, for example, sex, depressive symptoms, or peer popularity (chapter 1 and chapter 2). Thus, when limiting the analyses of receiving help to the level of the individual (and to these characteristics), help seems optimally organized - any adolescent receives help. However, these findings are more nuanced if the dyadic level is taken into account. Indeed, the dyadic level suggests that adolescents primarily (receive) help (from) similar others, calling into question the individual-level observation that help is optimally organized (see the remark on complementarity of helpers in the section on consequences of help). Similarly, chapter 4 showed that academic achievement is not affected by the number of helpers students report. Thus, at the individual level, network position is not relevant for academic success. However, looking at how help is organized at the classroom level, the number of helpers played a role: Academic achievement was lower in classrooms in which some adolescents were, relative to their classmates, worse off with regard to their number of helpers.

Thus, by limiting research into particular phenomena to the individual level, important facets may be overlooked. This may have consequences for understanding the phenomenon under study, but also for interventions. Based on my findings on the individual level, for example, no intervention would be necessary as the situation seems beneficial: The majority of students receives help. However, based on findings on the dyadic and classroom level, intervention might be useful for reducing segregation and inequality in help relations with potential better subsequent adjustment. Thus, to draw a complete picture of certain phenomena under study and to be able to develop appropriate interventions, researchers should take into account the wider context in which a phenomenon takes place.

DISCREPANCY BETWEEN 'BEST THEORY' AND 'BEST PRACTICE'

A third contribution of this dissertation is that it showed that the way in which adolescents engage in help relations did not always correspond to theoretical ideas regarding what would be the most optimal way to engage in help relations. For example, I found that individuals tend to reciprocate help nominations and prefer to have help relations with helpers-of-helpers. In addition, adolescents prefer to (receive) help (from) others with similar characteristics, and help occurs more often within friendships than outside friendships (chapter 2, 3). Combining these insights, adolescents seem to engage with a limited set of similar, close, others regarding help relations, and are structurally as well as socially segregated with regard to help. As discussed, limiting helping interactions to similar, close others has benefits, as it ensures higher levels of trust and it smoothens communication, but similarity versus complementarity may also contribute to help not meeting the needs or 'shortcomings' of the receiver. Thus, whereas similarity might be

beneficial for some social relationships, negative consequences could arise in the case of help when the combination of characteristics of giver and receiver of help hinder problem solving. As such, complementarity instead of similarity might be more beneficial for help relations.

At the classroom level (chapter 4), I theorized which specific classroom level structures should be most beneficial to school well-being, and in particular to academic achievement. I argued that achievement would flourish in classrooms where students were equally and abundantly involved in help, and where help relations were widespread as opposed to concentrated in sub-groups. These classrooms would be reflective of widespread trust, openness, and lower competition. Surprisingly, these theoretically 'ideal' classroom help networks were very scarce. For example, almost all classrooms were characterized by a tendency to cluster in groups, and in many classrooms help relations were quite scarce.

Thus, considering adolescents' adjustment, there seems to be a discrepancy between how help networks naturally occur and the theoretically most beneficial structure of help networks. The question is to what extent it is desirable or justified to interfere in adolescents' preferences for relationship formation and the resulting, naturally occurring social structure. Perhaps, reorganizing classroom help relations so that students are equally involved and have help relations with a more heterogeneous set of peers is beneficial for certain outcomes. For example, it may enhance the flow of different forms of help and information throughout the network, putting students into contact with peers that have different abilities and knowledge than themselves. This may not only facilitate problem solving directly, but may also aid in practicing and advancing problem solving skills: Help across group boundaries brings you in contact with peers that potentially experience different types of problems and deal with problems in different ways. However, pushing adolescents to interact with peers that are an excellent 'helping match' while ignoring preferences for relationship formation may have negative behavioral and social consequences. As highlighted in chapter 4, Gest and Rodkin (2011) found that classrooms in which teachers strategically grouped students together to foster new friendships or create academically diverse seating arrangements were characterized by less peer disapproval of aggression, weaker peer approval of prosocial behavior, and a lower tendency to reciprocate friendship nominations. It is noted in this paper: "*Peer relationships are a powerful source of social influence on children, and are just as likely (if not more likely) to be managed ineffectively by adults than to be productively engaged*" (Gest & Rodkin, 2011, pp. 294).

This discrepancy underlines the need to continuously rethink well-established theories and update them with findings from empirical practice and to let school interventions be informed by what is *considered* to be beneficial for adolescents' adjustment as well as what feels comfortable and natural for those who are part of the context in which intervention takes place.

THE IMPORTANCE OF DESCRIPTIVE STATISTICS

My dissertation also showed that descriptive statistics revealed unexpected but interesting information that was of much aid for further interpretation of my results. In chapter 1, a description of which unpleasant events SNARE-participants experienced gave me an indication as to which problems they deal with. In chapter 2, my assumption that lower achievers and depressed youth were less involved in giving and receiving help because of status concerns was contradicted by the absence of any correlation between achievement and depression on the one hand and social status on the other hand. The descriptive network overlap in chapter 3 showed how help does not take place within any friendship, and that also non-friends exchange help. A detailed description of how classroom characteristics coincide within classrooms (chapter 4) showed what kind of help networks exist, and how theoretically 'ideal' help networks did not exist. Finally, chapter 5 suggested that adolescents influence each other's depressive symptoms through help, but the detailed depression change matrices showed how this did not hold for adolescents who most often suffered from depressive symptoms.

Thus, in each chapter, descriptive statistics played a substantial role in the interpretation of my findings, and this dissertation showed that understanding the phenomenon under study clearly benefits from a more elaborated discussion of descriptive results. I would strongly advocate to more clearly visualize and present more detailed information regarding (the distribution of) the data. In this way, a more nuanced and sometimes unexpected 'story behind the test results' may be revealed. This helps with the interpretation of results (for whom, when, and how do these results hold?), and aids other researchers in verifying and replicating scientific research.

METHODOLOGICAL CONTRIBUTIONS

As emphasized throughout this dissertation, I contributed to general research on adolescent prosocial behavior in the peer context by conceiving of help as a social as opposed to individual phenomenon, and measuring it as a social network. This dissertation showed how help relations are associated with individual characteristics and friendship, how they are embedded in a network, and how they can be analyzed.

I also added to research on longitudinal social network analysis, specifically. Over the years, there have been advances in this field of which this dissertation could make use. Using these advances, this dissertation contributed to the field in two ways. First, the vast majority of SIENA-studies responded to a call to study the influence of social relations on individual behavior while controlling for selection processes (Snijders, Steglich, & Schweinberger, 2007; Veenstra et al., 2013) in order to more reliably assess peer influence processes. However, social relations may also effect outcomes on a higher level than the individual: Indeed, using multiplex social network analyses, chapter 3 showed how social relations may affect other social relations. This approach corresponds to previous (scarce) longitudinal studies into the multiplexity of social relations (e.g., Huitsing, Snijders, Van Duijn, & Veenstra, 2014; Rambaran, Dijkstra, Munniksma, & Cillessen, 2015). However,

these studies concerned social relations that mutually exclude one another within one dyad: It was examined how affiliation (e.g., friendship) may breed antagonism (e.g., antipathy) or vice versa. My study added to this research by demonstrating how multiple relationships may exist within one dyad, how these relations complement each other, and how affiliation may breed affiliation (see also Snijders, Lomi, & Torló, 2013). Researchers interested in the constituents of social relations and in factors contributing to relationship emergence, maintenance, and dissolution may take advantage of this approach.

Second, when studying social relations and behaviors, previous social network studies often modeled the presence of nominations in the network regardless of whether these nominations were newly made or already existing, using the evaluation function (for an exception see Kiuru et al., 2012; Laninga-Wijnen et al., 2017). Importantly, the findings from chapters 3 and 5 suggest that it is useful to distinguish between so-called creation and endowment effects. For example, the finding that similarity in depressive symptoms contribute to the presence of a relation (chapter 2) was further unpacked in chapter 5, where it became clear that similarity is only salient for the maintenance of existing relations and not for the initiation of new relations. Moreover, depressive symptoms did not contribute to being selected as new helper, but contributed to being maintained as helper. Whereas this was not possible to include in our model in chapter 5 yet, creation and maintenance effects may also be distinguished when modeling behavior dynamics, and represent increases and decreases in the behavior (see Haas & Schaefer, 2014). Future studies should more often consider whether it is meaningful to distinguish between creation and endowment parameters as opposed to modeling evaluation parameters only, as it may potentially do more justice to the complexity of network and behavioral data, and provides a more nuanced interpretation of results.

DIRECTIONS FOR FUTURE RESEARCH

From the discussion of my main findings and the contributions of my dissertation, I am further strengthened in my idea that prosocial behavior, and in particular help, should be more explicitly viewed as a phenomenon that is inherently social. This would do justice to the share that receivers of help, the dyad, the group, and the dynamics of help have in explaining help, its predictors, and its outcomes. I noted how this view opens up possibilities for further empirical and theoretical inquiry into help with specific suggestions regarding how future research should proceed. However, there are three additional important notions that need to be taken into account when studying help networks, but that could not be addressed in this dissertation.

DISTINGUISHING BETWEEN TYPES OF HELP

First, due to the general nature of the question tapping into help relations ('*Who helps you with problems, for example, with homework, with repairing a flat [bicycle] tire, or when you are feeling down?*'), I was not able to assess what type of help was being exchanged

between adolescents. As discussed in the introduction section of this dissertation, two types of help are particularly salient for adolescents: Practical and emotional support (Bergin, Talley & Hamer, 2003; Dunfield, 2014). These types of support differ in content as well as their emotional valence. Hence, adolescents are likely to differ in the extent to which they need or are able to provide a specific type of help. Using more specific peer nomination measures capturing different forms of help would allow a more detailed assessment of the types of help that are exchanged, which adolescents are typically involved in each type of help, and antecedents of who helps whom with specific issues. As emphasized in chapter 2, the preconditions for seeking or giving practical help from or to a particular peer may differ from seeking or giving emotional help. Moreover, distinguishing between types of support would give more clarity regarding what type of support is exchanged within versus outside friendships (chapter 3), and the consequences of various types of support for specific types of adjustment (chapter 4 and 5).

A methodological drawback of distinguishing between types of help would, however, be that these help networks will likely have a low density. I found that individuals mention two to three 'general' helpers in the classroom, which would likely decrease to one to two – or even zero – for specific types of support. I suspect that a low network density may result in analytical convergence problems, where deviations between simulated values of statistics and their observed values are too large (Ripley et al., 2018). For example, some network configurations may be too exceptional or too detailed to model. I ran into problems when attempting to model, for example, more detailed effects of the friendship network on the help network and vice versa. A possible solution may be to analyze networks at the school level. For example, Baerveldt and colleagues (2004) distinguished between practical and emotional support and found that pupils mentioned two to three helpers on average in the entire school. However, the assumption of actor-oriented models, as used in this dissertation, is that individuals have full information of all relations in the network when making their decisions about changes in relations or behavior. This assumption is less likely met in large school networks.

TAKING INTO ACCOUNT NEED, INTENTION, AND ABILITY

A second important consideration that needs attention when studying help networks is the intention and (perceived) need to seek help and the (perceived) ability to provide help. This dissertation gave information about the presence or absence of a help relation, but not about the process leading to this presence or absence. Absence of help could be the result of not needing help (e.g., because the problem can be solved by oneself), but also because of a low intention to seek help (e.g., because of a general negative attitude towards seeking help) (Gulliver, 2010; Rickwood & Thomas, 2012; Wilson, Deane, Ciarrochi, & Rickwood, 2005). Similarly, not being a helper may be reflective of not willing to help others, but also of not being able to help due to a lack of specific skills. Although I assessed associations of characteristics believed to reflect a need or ability to help (e.g., achievement, depressive symptoms) with giving and receiving help, I was not able to

explicitly take these underlying mechanisms into account. Controlling for these factors would enable to more reliably assess why some individuals do not give or receive help nominations, and also give more insight into why help is absent in some friendships, and explain the structure of help networks at the classroom level. However, given that the vast majority of students in the SNARE sample was involved in giving and receiving help, and given that my focus was to model general help relations as opposed to specific help interactions, I believe that controlling for these factors would not have strongly influenced the general findings.

EXAMINING DYNAMICS OF HELP

A third possibility for future studies is to further elaborate on the dynamic nature of help as a social relation. That is, studying help not as a relatively static, individual characteristic or ability ('This is an adolescent who helps'), but as a social interaction allows studying how adolescents direct their help to different others over time, and examine factors contributing to the initiation and maintenance of help relations and the emergence of help networks at the classroom level. Similar questions have been posed regarding adolescent friendships: Not only have researchers examined which adolescents typically established friendships from an individual perspective (Bowker et al., 2010; Gest, Graham-Berhmann, & Hartup, 2001), researchers also focused on friendship as social concept, addressing friendship emergence (Frank, Muller, & Mueller, 2013; Kandel, 1978) and factors contributing to the quality and maintenance of friendships (Branje, Frijns, Finkenauer, Engels, & Meeus, 2007; Bukowski, Hoza, & Boivin, 1994; Poulin & Chan, 2010). Help is as dynamic and multilayered as friendship, yet has not been studied as such. Whereas this dissertation provided first insights into this matter, further research is needed to draw a more complete picture of help as being subject to change, and as interaction that may, under certain conditions, be initiated and sustained.

PRACTICAL IMPLICATIONS

This dissertation focused on the classroom peer context in which help interactions take place. Although the peer environment plays a salient role in shaping help interactions, the results from this dissertation also pertain to teachers as they interact with their students and may as such contribute to shaping adolescents' classroom social environment (Farmer, McAuliffe Lines, & Hamm, 2011). As such, I will provide some practical implications that flow from this dissertation and that pertain to teachers' action.

On the basis of this dissertation, it still is too premature to state that a particular embeddedness in the help network or a particular help network structure has clear positive consequences. However, based on some of the findings in this dissertation and previous research, I argue that promoting help interactions in the classroom should be stimulated in general.

A way in which this could be achieved is by intervening in the help network

(Valente, 2014). As a first step towards network intervention, the network approach I took in this dissertation provides a tool for teachers to better recognize the dynamics of help relations in classrooms. Research comparing self-, peer- and teacher reports on social networks found that teachers are not always able to correctly identify which students are involved in bullying (Oldenburg, Bosman, & Veenstra, 2016), and the same holds possibly for positive peer interactions (Hamm, Farmer, Dadisman, Gravelle, & Murray, 2011). Moreover, my dissertation suggested that givers and receivers of help are not readily identifiable, and that the extent to which help occurs differs among classrooms. As such, a social network approach that explicitly lays out the structure of classroom help relations may support teachers in navigating students' help relations and intervene if necessary.

Teachers' knowledge of such social processes in the classroom is important for students, as it contributes to students' positive views of their school environment (Hamm et al., 2010; Hamm et al., 2011). Farmer (2000; 2006) explains that teachers may respond to the social network and improve classroom atmosphere in various ways. Having information about the social structure of the help network, teachers may group certain students together in order to foster the emergence of supportive relations in general. Also, valuable help interactions may be stimulated by promoting interaction among peers that have different characteristics (e.g., varying levels of achievement, status, or emotional problems) to foster problem solving.

A way in which can be intervened in social networks is illustrated by Neal (2014) in her research on network empowerment. It is argued that networks are empowered if individuals in a social setting have social relations that allow for the exchange of resources, and have equal power over (i.e., access to or control over) these resources. For help, this means that help relations are equally distributed among students in the classroom. Typically, I found 'disempowered' networks in which help relations were unequally distributed over students (see Figure 6.1), which resulted in lower academic achievement of all students in the classroom. Neal argues that, in such social networks, social relations should be formed that enable a more equal access to resources. To illustrate this, a 'disempowered network' is depicted in Figure 6.1, in which the size of the nodes represents individuals' number of helpers; their color low, medium, or high network centrality (light, medium, and dark grey; centrality as measured in chapter 4); and the lines the help nominations between individuals. In this network, individuals with 'powerful' network positions may be used to the benefit of individuals who have a position at the periphery of the network. For example, individual 9 may be asked to help individual 17, giving individual 17 direct access to a close group of helpers (students 1 to 4). In the current state of the network, it would take 17 four intermediaries to reach this sub-group. Similar efforts could be made to integrate other peripheral classmates in the help network.

Teachers' grouping or seating arrangements may, however, have negative consequences for the classroom atmosphere (Gest & Rodkin, 2011). To make sure that changes in the network are beneficial for students, teachers could discuss their seating
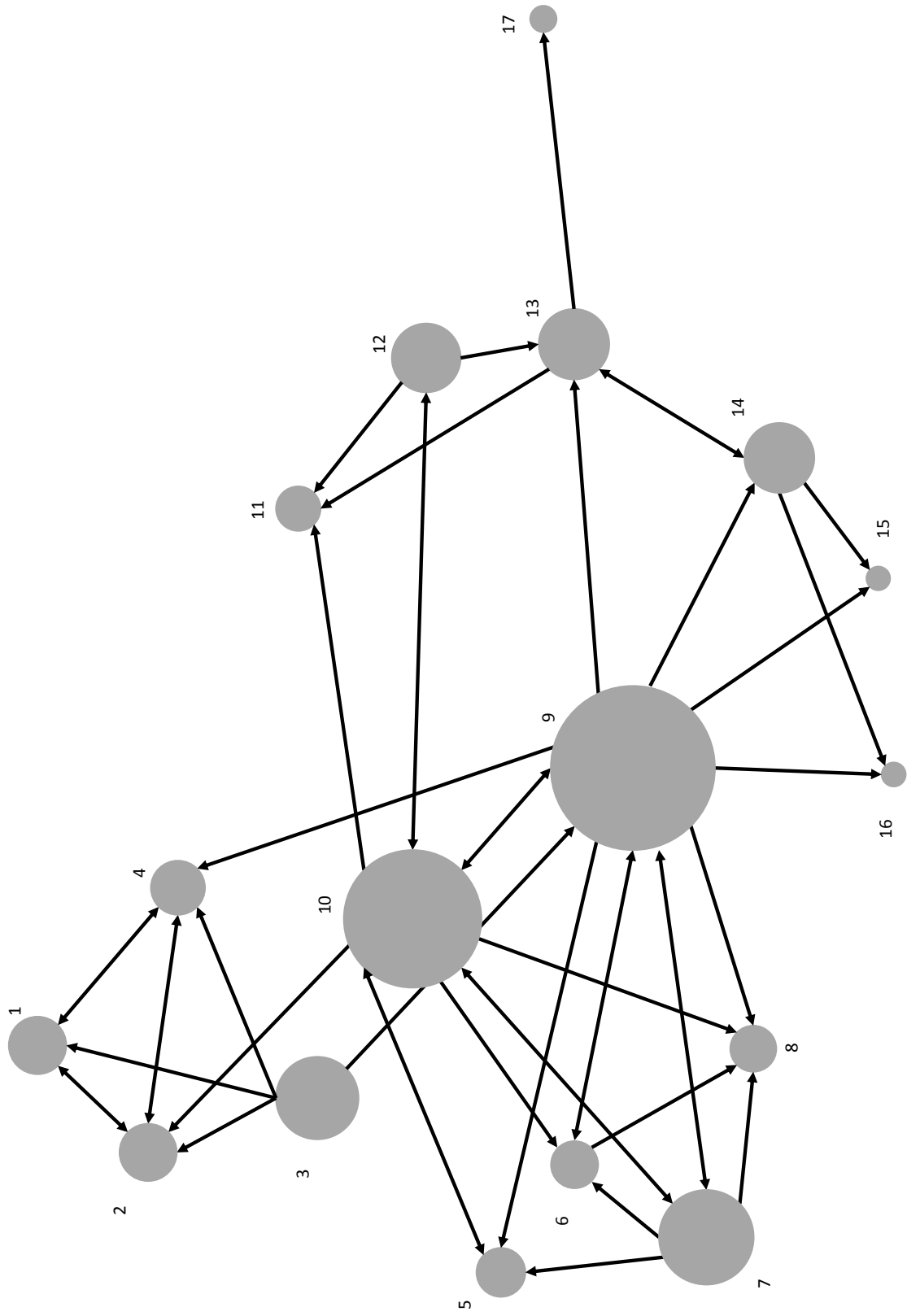
Figure 6.1.
'Disempowered' network, where some individuals have a higher number of helpers than others, and where some individuals take up a more central position than others.

or grouping arrangements with their students to be better able to also take students' preferences into account. Networked interventions are primarily suggested to benefit teachers' insight into students' social relations, but it might also be an asset to students themselves. Perhaps the state of the social network could be discussed in problematic classrooms; what do students think of the network, which members are vulnerable, which members are powerful, and how can the state of the network be altered? This may also give room to more openly discuss the type of problems classmates experience and who could be of help, possibly creating a more open atmosphere in which help can be harmlessly asked for.

Relatedly, teachers may focus on creating the basic boundary conditions that enable help to be used to all students' benefit. First, this may be achieved by ensuring a well-managed classroom in which, for example, positive behavior is reinforced, there are clear rules and expectations, and less room for aggressive behavior (Farmer et al., 2006). This may provide students with a calm and stable environment in which they can practice their positive social skills with peers, amongst which are empathy, helping, and seeking help (Luckner & Pianta, 2011). Second, it is argued that teachers may set a norm, or function as role model, for positive behaviors and relations in the classroom by having a good relationship with students themselves, and by being emotionally supportive to students (Farmer, Lines, & Hamm, 2011). Indeed, teachers' responsiveness to students' needs and having a positive emotional relation with students is associated with denser and less hierarchical positive social networks (Gest & Rodkin, 2011; Hendrickx, Mainhard, Boor-Klip, Cillessen, & Brekelmans, 2016), and with students' prosocial behavior (Hendrickx et al., 2016; Luckner & Pianta, 2011). Information about the social network could help to determine in which classrooms and for which students modeling norms for helping may be especially necessary. Moreover, it could provide information about which students may aid the teacher in setting a norm, for example, those students already actively involved in seeking help or giving help.

In sum, teachers may create boundary conditions for the exchange of help by managing the classroom and by providing examples of how to behave. This may stimulate help relations in general, and perhaps contribute to the feeling that help may be asked from anyone, not just from friends or peers that experience similar problems. The use of social networks may provide teachers as well as students with information on the social processes in the classrooms, and seems a promising tool for intervention. However, more research is needed to examine to what extent teachers may alter the network structure, and to what extent these alterations are in concordance with youths' preferences for relationship formation.

CONCLUDING REMARKS

Through my research, I aimed to move the field on adolescent social relations with their peers and adolescent prosocial behavior, specifically help, forward by conceiving of help as

a phenomenon that is inherently social. In doing so, I acknowledged that not only givers, but also receivers are involved in help; that help is a social relationship or interaction that has particular characteristics; that help is embedded in a wider social context, and that help has consequences. This approach added novel insights to the existing body of knowledge on adolescent help behavior. Amongst others, I found that experiencing problems and seeking help for these problems is common; that help behavior is selective, that is, asked from or directed primarily towards similar others and friends, that tendencies towards giving and receiving help vary over friendships and contexts; and that help has outcomes for social embeddedness, achievement, and depressive symptoms. I hope researchers will further pursue this line of research by examining the associations found in more detail, and generally by considering the early adolescent peer group as a context in which positive, supportive interactions take place.

Appendix chapter 3

Suppose x stands for a friendship nomination and z stands for a help nomination, then a friendship nomination from ego i to alter j is represented by

$$x_{ij}.$$

A help nomination from i to j is represented by

$$z_{ij}.$$

The effect of this help nomination on a friendship nomination, referred to in the Siena model by `crprod`, is represented by

$$z_{ij}x_{ij}. \quad \text{(a)}$$

A mutual help nomination between i and j is represented by

$$z_{ij}z_{ji}.$$

The effect of this help nomination on a friendship nomination, referred to in the Siena model by `crprodMutual`, is represented by

$$z_{ij}z_{ji}x_{ij}.$$

A one-sided help nomination between i and j is represented by

$$z_{ij}(1 - z_{ji}). \quad \text{(b)}$$

The corresponding part of the model reads

$$\beta_1 z_{ij}x_{ij} + \beta_2 z_{ij}z_{ji}x_{ij}. \quad \text{(c)}$$

To specify the contributions (a) and (b), noting that (b) is not directly expressed in (c), we rewrite (c) as

$$\beta_1 z_{ij}(1 - z_{ji})x_{ij} + (\beta_1 + \beta_2)z_{ij}z_{ji}x_{ij}.$$

This shows that, given model specification (c), the effect of one-sided help versus no help is expressed by β_1 and of mutual help versus no help by $\beta_1 + \beta_2$.

Nederlandse samenvatting

Summary in Dutch

De overgang van de basisschool naar de middelbare school kent vele uitdagingen. Jongeren krijgen te maken met sociale, biologische en cognitieve veranderingen, zoals de puberteit, spanningen in de relatie met hun ouders, huiswerk en een nieuwe school en klasgenoten. Jongeren hoeven er niet alleen voor te staan, maar kunnen steun van hun sociale omgeving zoeken en ervaren. Klasgenoten spelen hierbij een grote rol, omdat jongeren zich los proberen te maken van hun ouders en veel tijd doorbrengen met leeftijdsgenoten op school. Het doel van mijn proefschrift is om de rol van klasgenoten in het hulpnetwerk van jongeren te onderzoeken. Specifiek ben ik benieuwd naar voorspellers en gevolgen van hulprelaties.

Dit proefschrift draagt op twee manieren bij aan eerder onderzoek. Ten eerste benadrukt onderzoek tot dusver de rol van leeftijdsgenoten in de ontwikkeling van risicogedrag onder jongeren, zoals alcoholgebruik en criminaliteit, maar is er weinig bekend over positief gedrag onder jongeren. Ten tweede ligt de nadruk in onderzoek naar hulp op kenmerken van jongeren die hulp geven, maar het is nog onduidelijk welke jongeren hulp *ontvangen*, wie *elkaar* helpen en wat de *gevolgen* van hulp zijn. Ik draag met mijn proefschrift bij aan voorgaand onderzoek door de ontwikkeling van *positief* gedrag onder jongeren te onderzoeken en door de *relationele aspecten* van hulp te onderzoeken in plaats van hulpgedrag als individueel kenmerk. Ik heb hierbij gebruik gemaakt van een sociale-netwerk benadering. Deze benadering stelt de sociale relaties van individuen centraal in plaats van hun individuele kenmerken. Sociale relaties kunnen worden bestudeerd met een zogeheten peer nominatie methode. Om hulprelaties in kaart te brengen is deelnemers aan mijn onderzoek gevraagd om klasgenoten te noemen voor wie de volgende omschrijving geldt: '*Wie helpt jou met problemen (bijvoorbeeld met huiswerk, met het plakken van een band, of als je het even niet meer ziet zitten)?*'. In totaal zijn er voor elke studie tussen de 1000 en 1600 leerlingen in 40 tot 81 klassen bevraagd. Figuur 1 is een visuele weergave van één hulpnetwerk gebaseerd op de antwoorden van alle leerlingen in een klas. Leerlingen zijn weergegeven als stippen en de pijlen tussen stippen geven weer wie leerlingen als hulpbron noemen. Met behulp van deze vraag en kenmerken van leerlingen zoals sekse, schoolprestaties, emotioneel welzijn en sociale status heb ik de voorspellers en gevolgen van hulprelaties onderzocht. Specifiek zijn de volgende onderzoeksvragen beantwoord:

Wie geeft hulp, wie ontvangt hulp en wie helpt wie?

Hoe hangt het geven en ontvangen van hulp samen met vriendschap?

Zijn er verschillen tussen klassen in de structuur van hulpnetwerken, hoe zijn leerlingen ingebed in het hulpnetwerk en hangt dit samen met schoolcijfers?

Wat is het effect van het ontvangen van hulp op de ontwikkeling van depressieve symptomen?
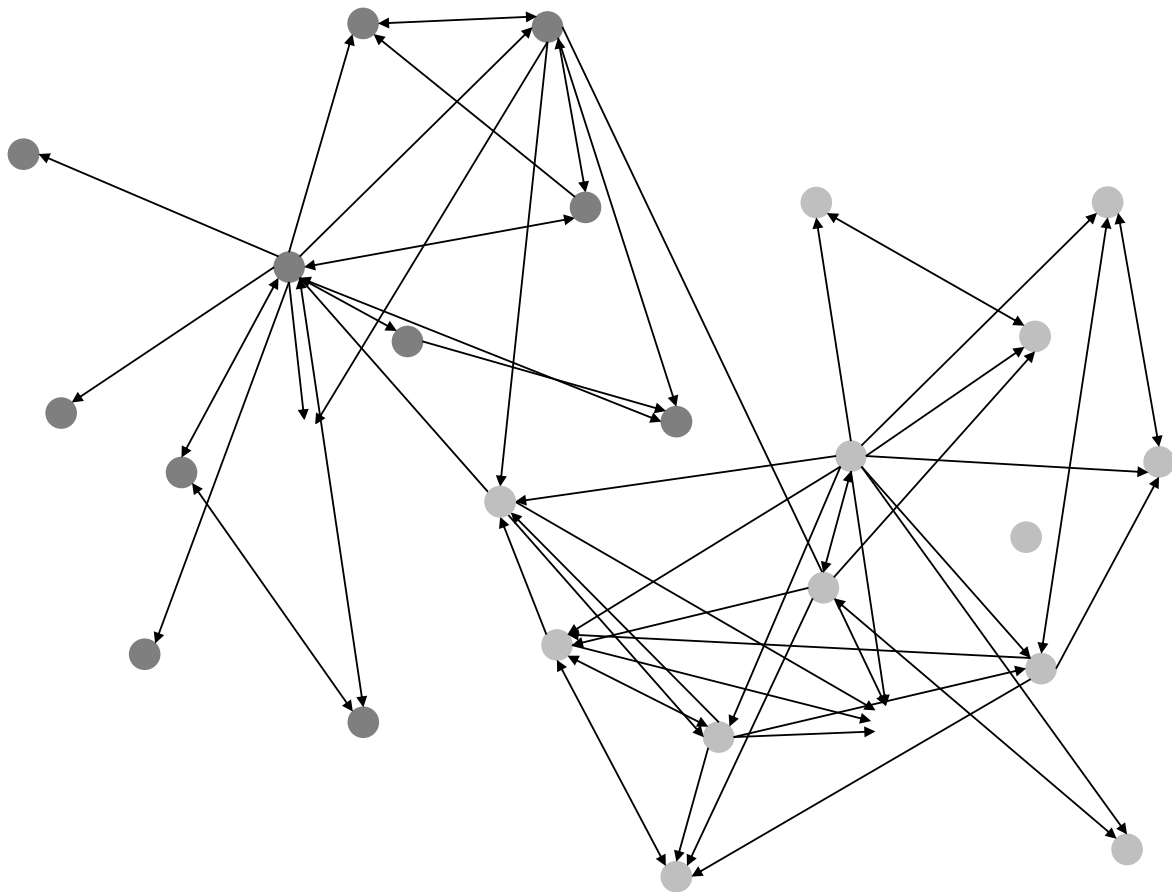
Figuur 1.
Hulpnetwerk in een klas op basis van de vraag "Wie helpt jou met problemen?". Leerlingen worden weergegeven als stippen en de pijlen tussen stippen geven weer wie leerlingen als hulpbron noemen. Lichtgekleurde stippen zijn meisjes, donkergekleurde stippen zijn jongens.

Voorspellers van hulprelaties

Wie geeft hulp, wie ontvangt hulp, en wie helpt wie?

Allereerst blijkt uit mijn onderzoek dat veel jongeren problemen ervaren, variërend van dagelijkse beslommeringen tot ernstige problemen (hoofdstuk 1). Ook blijkt dat veel jongeren hiervoor hulp ontvangen of bieden. Gevers en ontvangers van hulp zijn goed ingebed in het sociale netwerk van de klas (hoofdstuk 2). Ze zijn bijvoorbeeld populairder, worden minder vaak onaardig gevonden en hebben meer vriendschappen. Niet alleen jongeren die hulp geven, maar ook jongeren die hulp ontvangen worden dus sociaal geaccepteerd. Uit eerder onderzoek bleek dat jongeren met een hulpvraag bang waren voor afwijzing door klasgenoten of om dom te worden gevonden, maar deze angst lijkt ongegrond.

Opvallend waren de resultaten over welke jongeren *elkaar* helpen: jongeren zijn namelijk selectief als het gaat om hulpuitwisseling en noemen twee tot drie hulpbronnen (hoofdstuk 2). Dat aantal is lager dan het aantal vrienden dat jongeren gemiddeld hebben. Net als met vriendschappen beperken jongeren hun hulpinteracties

vooral tot klasgenoten op wie ze lijken, bijvoorbeeld als het gaat om sekse, depressieve symptomen, schoolprestaties en sociale status. Meisjes vragen bijvoorbeeld vaker hulp van andere meisjes. Ook vragen jongeren hulp van klasgenoten die dezelfde mate van depressieve symptomen ervaren. Een mogelijke verklaring hiervoor is dat communicatie met gelijkgestemden makkelijker gaat en begrip voor gelijke anderen makkelijker is op te brengen (McPherson, Smith-Lovin, & Cook, 2001). Dit kan echter ook kwalijke gevolgen hebben: als jongeren met dezelfde problemen of klachten elkaar helpen, zouden ze elkaar in een neerwaartse spiraal kunnen trekken.

De selectiviteit in hulprelaties vond ik ook terug in mijn onderzoek over de invloed van vriendschap op de ontwikkeling van hulprelaties (hoofdstuk 3). Hulp wordt vaker in vriendschappen uitgewisseld, maar verrassend genoeg helpen niet alle vrienden elkaar. Wellicht dienen sommige vrienden vooral als gezelschap in plaats van als vangnet voor het bespreken van problemen. Daarnaast worden sommige klasgenoten als hulpbron genoemd, maar niet als vriend. Hoewel dit proefschrift hier niet verder op is ingegaan, is het interessant te onderzoeken waarom in sommige vriendschappen geen hulp wordt uitgewisseld en waarom sommige andere klasgenoten wel als hulpbron worden genoemd.

EIGENSCHAPPEN VAN HULPNETWERKEN

Sociale relaties hebben ook zogeheten structurele kenmerken - kenmerken die losstaan van kenmerken van individuen. Op klassenniveau heb ik specifiek gekeken naar variaties in de *hoeveelheid* hulp die in klassen wordt uitgewisseld, de mate waarin hulp plaatsvindt in *groepen* en de mate waarin er *ongelijkheid* is in het aantal hulpbronnen dat leerlingen noemen (hoofdstuk 4). Daarnaast heb ik bekeken hoe deze structurele kenmerken samenhangen met schoolcijfers. Mijn verwachting was dat schoolcijfers het hoogst zouden zijn in klassen waarin veel hulp plaatsvindt, waar hulp niet geclusterd is in groepen en waar iedereen in gelijke mate wordt geholpen, aangezien deze eigenschappen ogenschijnlijk het meest bevorderlijk zijn voor de sfeer in de klas en het onderlinge vertrouwen tussen klasgenoten. Opvallend genoeg komt die ideale combinatie van structurele eigenschappen niet voor. Allereerst variëren klassen op de dimensies die ik onderzocht: geen enkele klas vertoont dezelfde (combinatie van) eigenschappen. Deze bevinding illustreert dat elke klas haar eigen sociale dynamiek heeft die wellicht lastig te voorspellen is. Theoretisch betekent dit dat er meer verfijnde theorieën ontwikkeld moeten worden die zoveel variatie tussen klassen kunnen verklaren. Een voorbeeld is de *network ecology theory* (McFarland et al., 2014), waarin niet alleen gekeken wordt naar individuele voorkeuren om relaties aan te gaan (bijvoorbeeld op basis van reciprociteitsprincipes of gelijkheid in kenmerken) maar ook naar de manier waarop eigenschappen van de sociale context die individuele voorkeuren beïnvloeden.

GEVOLGEN VAN HULPRELATIES

HULP EN DE ONTWIKKELING VAN VRIENDSCHAP

Uit mijn proefschrift blijkt dat vriendschappen bijdragen aan de ontwikkeling van
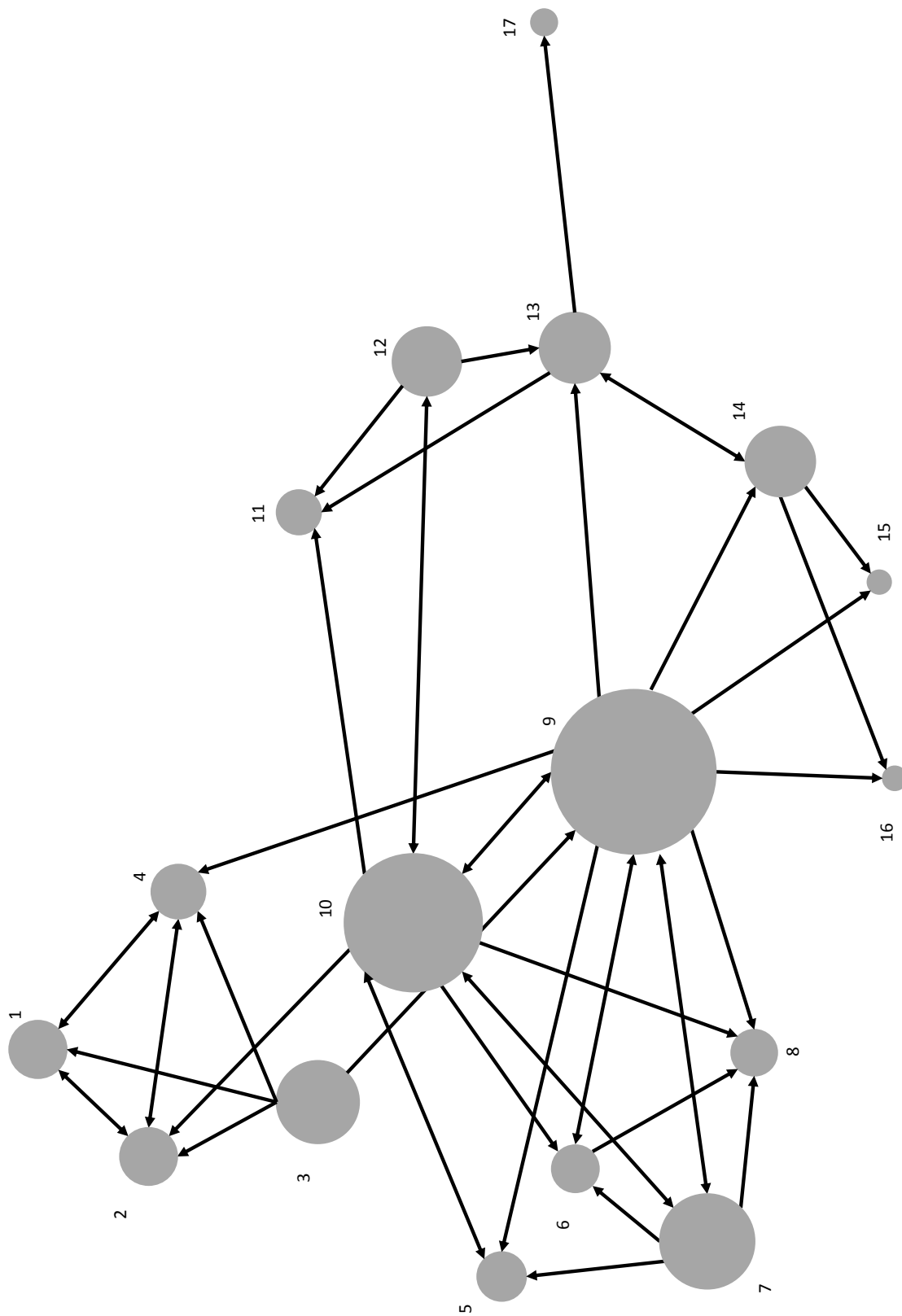
Figuur 2.
Hulpnetwerk waarin hulprelaties ongelijk verdeeld zijn tussen leerlingen. Grotere stippen zijn leerlingen die meer hulpbronnen noemen.

hulprelaties, maar ook dat deze relatie andersom opgaat: hulp kan namelijk bijdragen aan het aangaan en versterken van vriendschappen (hoofdstuk 3). Daarnaast kan hulp bijdragen aan het aangaan van vriendschappen, maar niet als allebei de vrienden hulp aan elkaar vragen. Zulke tweezijdige hulp zonder enige vorm van vriendschap komt echter dusdanig weinig voor dat het onwaarschijnlijk en wellicht niet normatief is om elkaar wederzijds te steunen als je elkaar nog niet goed kent of nog geen betekenisvolle vriendschap hebt. Wellicht schrikt het jongeren af als er in zo een situatie intensief over problemen wordt gesproken. Misschien leidt hulp met name tot vriendschap als het langzaam meegroeit met vriendschap.

HULP EN DE ONTWIKKELING VAN SCHOOLPRESTATIES

In dit proefschrift heb ik de gevolgen van inbedding in het hulpnetwerk en kenmerken van het hulpnetwerk voor schoolcijfers onderzocht (hoofdstuk 4). De resultaten suggereerden dat het niet van belang is hoeveel hulp leerlingen ontvangen, maar met name of leerlingen de meest geschikte hulpgevers in het netwerk kunnen bereiken. Daarnaast blijkt dat een ongelijke verdeling van hulp over leerlingen tot verlaagde schoolprestaties in de klas kan leiden. Het maakt echter niet uit hoeveel hulprelaties er zijn in de klas en of deze relaties al dan niet clusteren in groepjes. Figuur 2 geeft een netwerk weer waarin hulp ongelijk verdeeld is. Meestal zijn er in zulke klassen enkele leerlingen die aangeven van veel medeleerlingen hulp te ontvangen (bijvoorbeeld leerling 9), terwijl de overgrote meerderheid slechts een aantal hulpbronnen noemt (bijvoorbeeld leerling 17). Deze bevinding komt ook naar voren in voorgaand onderzoek, waarin is beargumenteerd dat een hiërarchisch netwerk competitiedrang versterkt, wat de sfeer in de klas en schoolprestaties kan verslechteren.

HULP EN DE ONTWIKKELING VAN DEPRESSIEVE SYMPTOMEN

Als laatste is in dit proefschrift gekeken naar de gevolgen van het ontvangen van hulp voor depressieve symptomen (hoofdstuk 5). Uit de resultaten kwam naar voren dat hulp van depressieve klasgenoten depressieve symptomen in ontvangers van hulp vermindert. Dit kan komen doordat depressieve jongeren zich beter kunnen inleven in de problemen van anderen en betere hulp geven. Er kan ook sprake zijn van een contrasteffect: jongeren kunnen zich beter gaan voelen door interacties met klasgenoten die zich slecht voelen. Daarnaast blijkt dat hulp geven leidt tot een vermindering van depressieve symptomen. Wellicht leren hulpgevers van hun eigen adviezen aan anderen, of voelen ze zich gesterkt wanneer ze ontdekken dat klasgenoten ook problemen ervaren en zich slecht kunnen voelen. Deze studie heeft laten zien dat jongeren een positieve invloed kunnen uitoefenen op het welzijn van klasgenoten via hulprelaties.

IMPLICATIES

Hulp lijkt positieve gevolgen te kunnen hebben voor sociale inbedding, schoolcijfers en

depressieve symptomen. Dit duidt erop dat hulpuitwisseling tussen jongeren gestimuleerd zou moeten worden. Docenten in het voorgezet onderwijs spelen hierin een belangrijke rol en kunnen baat hebben bij de sociale-netwerk benadering die in dit proefschrift is gebruikt. Uit vorig onderzoek is gebleken dat docenten niet altijd een helder beeld hebben van de sociale relaties in de klas. Daarnaast varieert de manier waarop hulp wordt uitgewisseld over klassen heen. Een visuele weergave van sociale (hulp)netwerken geven expliciet de sociale structuur van één specifieke klas weer en kunnen docenten handvatten bieden om sociale interacties te sturen. Leerkrachten zouden bewust leerlingen kunnen koppelen die elkaar kunnen helpen (bijvoorbeeld iemand met slechte cijfers en iemand met goede cijfers), of leerlingen die buiten het netwerk vallen kunnen plaatsen bij een medeleerling die juist goed is ingebed in het hulpnetwerk. Zo zou, in Figuur 2, leerling 9 gevraagd kunnen worden om leerling 17 te helpen, wat leerling 17 toegang geeft tot een hecht groepje hulpgevers (leerlingen 1 tot en met 4). In het huidige netwerk zou 17 dit groepje pas via drie andere klasgenoten kunnen bereiken. Om hulp in het algemeen te stimuleren zouden leerkrachten het goede voorbeeld kunnen geven door hun leerlingen openlijk te steunen en positieve relaties met hen te onderhouden. Een sociaal netwerk kan hierbij worden ingezet door te laten zien welke leerlingen de leerkracht kan inschakelen om een norm te helpen stellen, bijvoorbeeld leerlingen die anderen al veel helpen of veel om hulp vragen.

Eerder onderzoek naar interventie van docenten in sociale netwerken van leerlingen laat echter zien dat interventie, bijvoorbeeld het bij elkaar zetten van bepaalde leerlingen om sociale relaties te stimuleren, niet altijd bevorderlijk is voor de sfeer in de klas (Gest & Rodkin, 2011). Daarom moeten netwerkinterventies altijd plaatsvinden in overleg met de leerlingen. Hiertoe zou netwerkinformatie niet alleen met de leerkracht gedeeld moeten worden, maar ook met leerlingen. Er kan bijvoorbeeld samen gekeken worden naar de staat van het netwerk: wat vinden leerlingen van de hoeveelheid hulpinteracties in de klas? Welke klasgenoten zijn (minder) sterk ingebed in het netwerk? Hoe kan het netwerk veranderd worden om iedereen van hulp te laten profiteren? Deze aanpak zou tot een betere verdeling en inzet van hulp kunnen leiden, maar het openlijk bespreken van hulpvragen zou tevens kunnen bijdragen aan een sfeer waarin problemen openlijk toegegeven en besproken kunnen worden.

Toch zou vervolgonderzoek meer expliciet moeten uitwijzen wat een bepaalde netwerkstructuur in de klassencontext betekent en impliceert en hoe een netwerk kan bijdragen aan de sfeer in de klas en het welzijn van jongeren. Sociale netwerken kunnen namelijk inzicht bieden in de sociale structuur van de klas en bieden waardevolle inzichten voor interventie, maar er is verder onderzoek nodig om er achter te komen hoe in deze netwerken zou moeten worden geïntervenieerd.

Conclusie

In dit proefschrift ben ik niet alleen ingegaan op eigenschappen van jongeren die hulp geven, maar ook op eigenschappen van jongeren die hulp ontvangen, de relatie tussen jongeren die hulp uitwisselen, de sociale context waarin hulp plaatsvindt en de gevolgen van hulp. Door de sociale aspecten van hulp in aanmerking te nemen geeft dit proefschrift meer inzicht in hulpuitwisseling tussen jongeren. Zo laat ik zien dat jongeren niet met iedere klasgenoot hulprelaties aangaan, maar dat zij hierin selectief zijn: hulp wordt bijvoorbeeld met name uitgewisseld in (groepjes van) gelijkgestemden en tussen vrienden. Ook heb ik laten zien dat hulp consequenties heeft voor de sociale inbedding in de klas en vriendschap, schoolprestaties en depressieve symptomen. Toekomstig onderzoek zal dus in ogenschouw moeten nemen dat hulp niet alleen om de gever van hulp draait, maar ook om degene die hulp ontvangt en hun interactie. Zo wordt niet alleen duidelijker wie op welke wijze is ingebed in het hulpnetwerk, maar ook wat de onderliggende mechanismen zijn die kunnen verklaren wie specifiek wie helpt en welke gevolgen hulp heeft. Door het beantwoorden van de vragen in dit proefschrift hoop ik aanknopingspunten te bieden voor verder onderzoek naar hulprelaties tussen jongeren en naar de klassencontext als een plek waar jongeren positieve interacties met elkaar aangaan.

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Curriculum Vitae

Loes van Rijsewijk werd geboren op 2 februari 1990 te Hengelo, Overijssel. Nadat ze in 2008 haar Gymnasiumdiploma had behaald, verhuisde ze naar het hoge Noorden om Sociologie te studeren aan de Rijksuniversiteit Groningen. Tijdens het schrijven van haar bachelorthese over probleemgedrag onder jongeren raakte ze geïnteresseerd in een carrière als onderzoeker. Ze werd aangenomen voor de *Research Master Human Behavior in Social Contexts* en behaalde haar MSc (cum laude) in 2013. Tijdens haar master bezocht ze prof. dr. Mara Brendgen aan de Université de Québec à Montréal in Montréal, Canada, om daar tijdens een onderzoeksstage van drie maanden de invloed van genen en omgeving op prosociaal gedrag te onderzoeken. Ook schreef ze samen met prof. dr. René Veenstra, dr. Jan Kornelis Dijkstra en dr. Christian Steglich een onderzoeksvoorstel over de voorspellers en gevolgen van hulprelaties van jongeren met hun klasgenoten, waarvoor ze werd beloond met een Onderzoekstalent beurs van de Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO). Hiermee kon ze aan de slag als promovenda bij de vakgroep Sociologie. Van oktober tot en met december 2016 werkte ze als *exchange scholar* aan haar proefschrift aan de Arizona State University (Tempe, Arizona, Verenigde Staten) bij de onderzoeksgroep van prof. dr. Richard Fabes, expert op het gebied van prosociaal gedrag. Loes heeft haar werk gepresenteerd op meerdere nationale en internationale conferenties en heeft haar werk gepubliceerd in een internationaal *peer-reviewed* wetenschappelijk tijdschrift. Loes was naast haar werk als onderzoeker ook actief voor meerdere commissies en raden, als organisator van meerdere congressen en als docent voor Bachelor- en Mastervakken. Daarnaast heeft ze van januari tot en met juli 2016 voor NWO gewerkt, waar ze betrokken was bij werkzaamheden rondom de aanvraagrondes van de VENI en Onderzoekstalent subsidies. Momenteel werkt Loes als onderzoeker bij de afdeling Onderzoek, Informatie & Statistiek van de Gemeente Groningen.

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