

# 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.

**This chapter is based on:**

Van Rijsewijk, L. G. M., Snijders, T. A. B., Dijkstra, J. K., Steglich, C. E. G., & Veenstra, R. Disentangling the interplay between adolescents' friendships and help relationships. *Currently under review by an international peer-reviewed journal*

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## 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 (Burhmester & 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.

## THEORETICAL BACKGROUND

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  $\eta$ , 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	$i \longrightarrow j$	$i \cdots \cdots \rightarrow j$
2	Effect of help on friendship maintenance	$i \begin{matrix} \longrightarrow \\ \cdots \cdots \rightarrow \end{matrix} j$	$i \cdots \cdots \rightarrow j$
3	Effect of mutual help on friendship initiation	$i \longleftrightarrow j$	$i \cdots \cdots \rightarrow j$
4	Effect of mutual help on friendship maintenance	$i \begin{matrix} \longleftrightarrow \\ \cdots \cdots \rightarrow \end{matrix} j$	$i \cdots \cdots \rightarrow j$
5	Effect of friendship on help	$i \cdots \cdots \rightarrow j$	$i \longrightarrow j$
6	Effect of mutual friendship on help	$i \langle \cdots \rangle j$	$i \longrightarrow j$

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

Note. <sup>a</sup> summed over classrooms <sup>b</sup> averaged over classrooms <sup>c</sup> 1 and 2 refer to the transitions between wave 1 and wave 2, and wave 2 and wave 3, respectively.

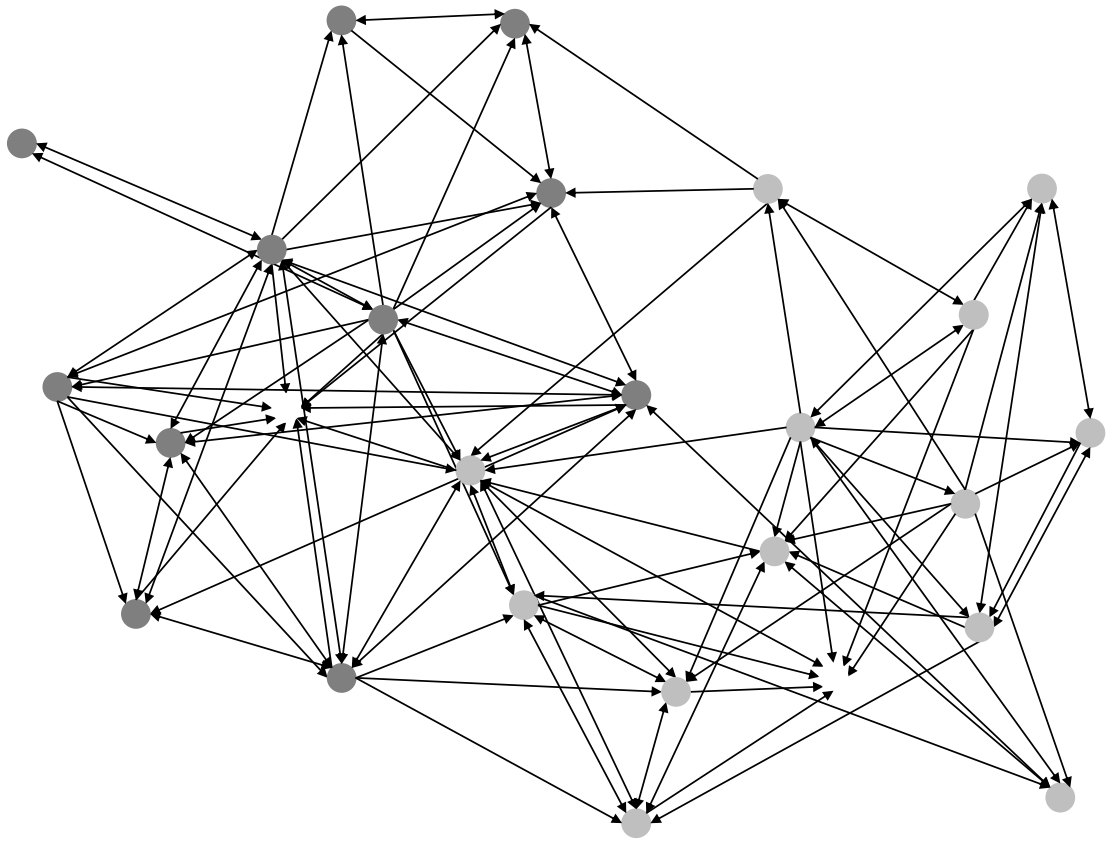


Figure 3.1  
Friendship network of one classroom at wave 2

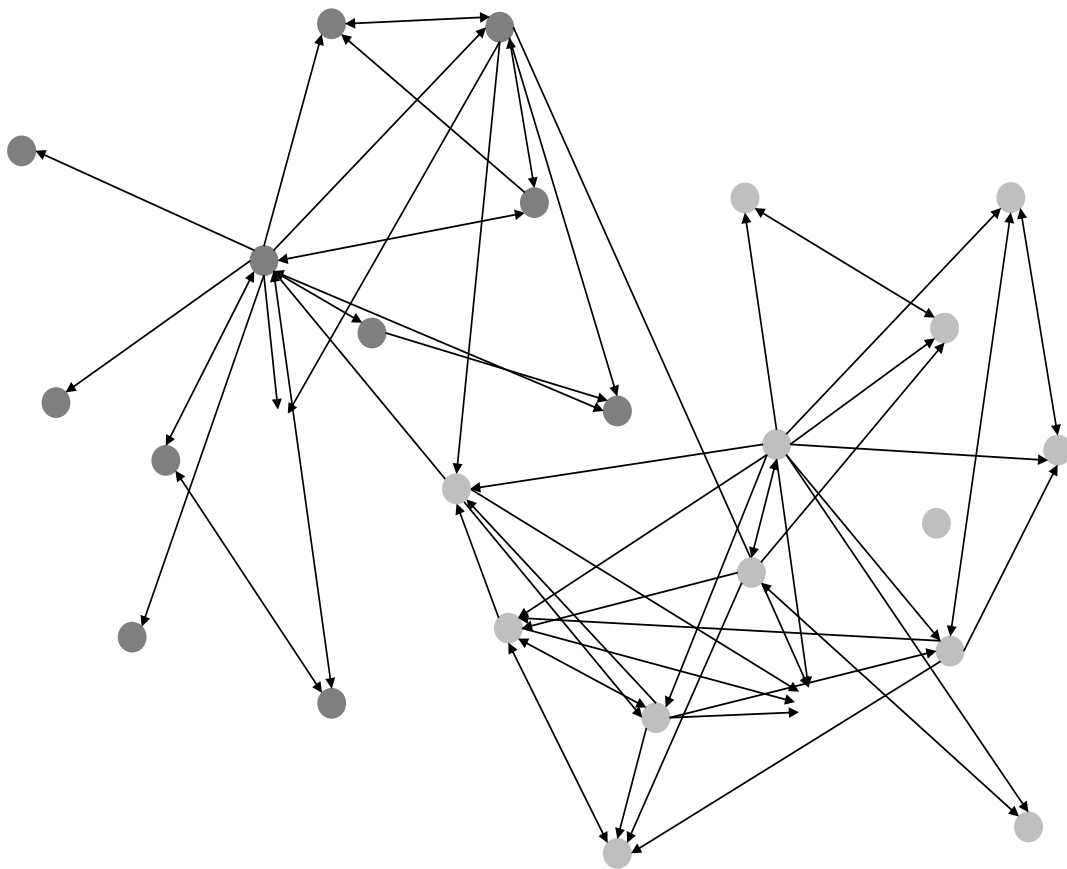


Figure 3.2  
Help network of the same classroom at wave 2

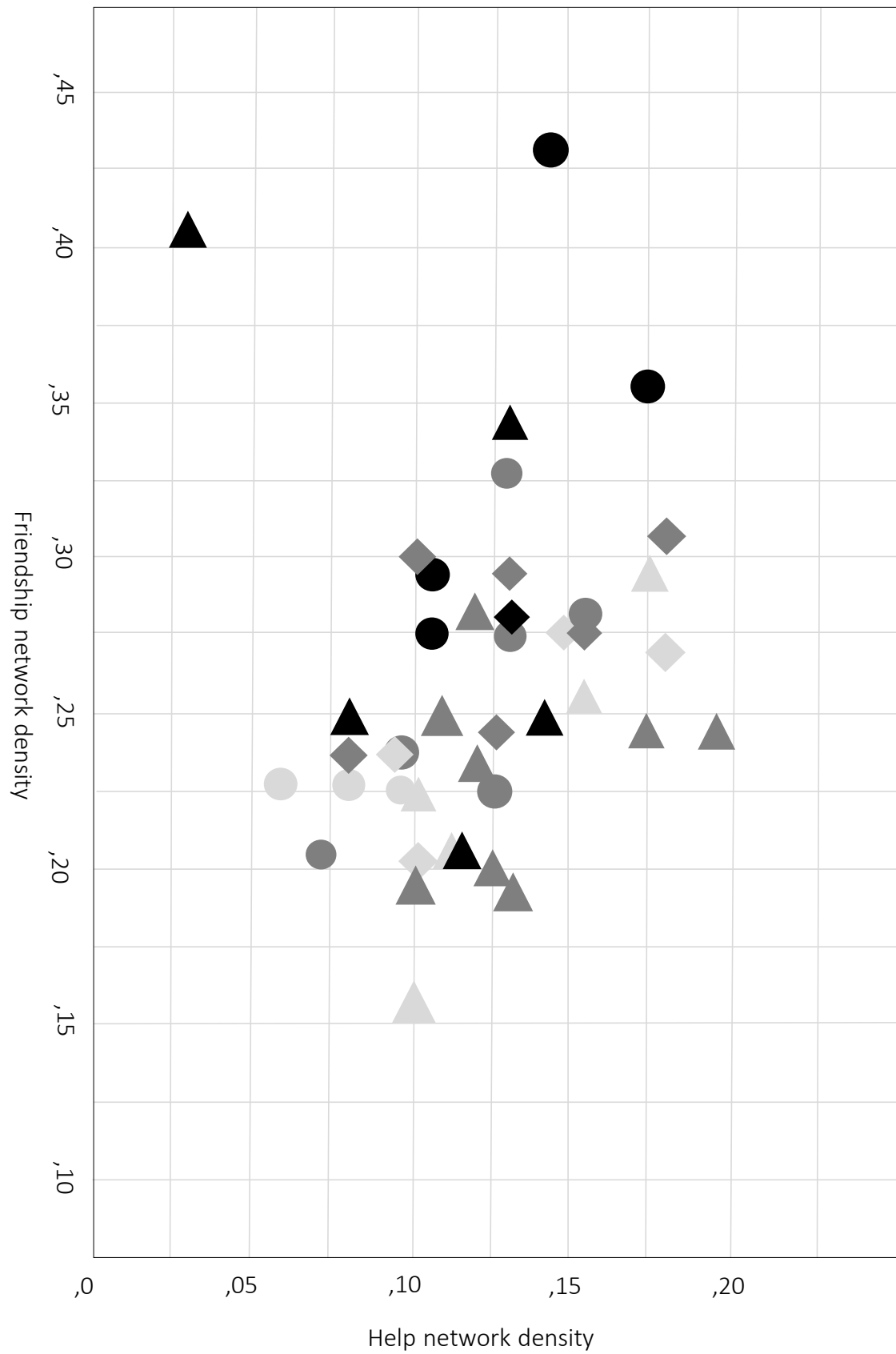


Figure 3.3  
 Scatterplot of the association between help network density and friendship network density. Each node represents a classroom. Colors represent high (light grey) medium (dark grey) and low (black) help network reciprocity, and the shape represents high (diamond) medium (triangle) and low (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 <sup>1</sup>	% One-sided friendship <sup>2</sup>	% Mutual friendship <sup>3</sup>	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 <sup>1</sup>	% One-sided help <sup>2</sup>	% Mutual help <sup>3</sup>	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 3				
	N	% No friendship <sup>1</sup>	% One-sided friendship <sup>2</sup>	% Mutual friendship <sup>3</sup>	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 <sup>1</sup>	% One-sided help <sup>2</sup>	% Mutual help <sup>3</sup>	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  $\eta$ , 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			
	$m$	$sd(m)$	$p$	$\eta$	$sd(\eta)$	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 characteristics (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, & Kanevsj, 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.