Connecting, Interacting and Supporting
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Chapter 5
The role of cognitions in peer networks within small group teaching

In contrast with the family capital investigated in Chapter 4, both peer and faculty capital contribute to self-efficacy and study success. Academic and social support, i.e., study-related and non-study-related or friendship support respectively, constitute forms of peer capital. This chapter focuses on whether three cognitions—growth mindsets, self-efficacy, and self-perceived popularity—contribute to the actual popularity of students in the academic and social support peer networks that emerge within seminars, a form of small group teaching implemented at a German university. Similar to students in other small group teaching forms, such as learning communities, seminar students actively collaborate and discuss the study material, while also becoming socially involved. The findings and implications of this chapter thus can inform the practices of other universities with small group teaching formats.6

6 This chapter is based on Zander, L*, Brouwer, J.*, Crayen, C., & Hannover, B. Help, when they need somebody: Do growth mindsets and self-efficacy beliefs predict social status in academic help-networks? Manuscript under review; international peer reviewed academic journal.

*Equal contribution to this manuscript.
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Abstract. This study longitudinally investigates how growth mindsets and self-efficacy—both associated with people’s adaptive management of challenges—facilitate popularity in academic and social support networks. In seminar groups, 580 university students reported their beliefs about the malleability of their capabilities and intelligence, their self-efficacy, and their self-perceived popularity in academic and social support networks. They also participated in a sociometric assessment of actual peer popularity in academic and social support networks at the beginning and end of the term. Actual popularity can reflect integration in the peer network. Path analyses reveal that growth mindsets and self-efficacy predict actual popularity, directly or indirectly. Students who believe their capabilities or intelligence can change are more appealing as academic helpers than students who perceive intelligence as fixed. Students with higher self-efficacy regard themselves as more popular in academic support networks; self-perceived popularity in turn positively predicts their actual popularity in the academic support networks. These findings highlight two routes to actual academic integration: a belief in people’s ability to grow in academically challenging situations and self-perceived popularity in academic support networks. Further research should investigate how teachers in higher education might foster growth mindsets and self-efficacy in a small group teaching context.

Keywords: growth mindsets, self-efficacy, self-perceived popularity, peer networks, higher education students

5.1. Introduction

In most Western countries, including Germany and the Netherlands, increasing university enrollment has resulted in a more diverse student population in terms of background characteristics, achievement levels, and needs (Beerkens-Soo & Vossensteyn, 2009; OECD, 2012a). Despite increased enrollment, the availability of educated people in the labor market continues to be deemed too low, partly due to a relatively high dropout rate. Consequently, one of the key issues for higher education research and policy in OECD countries is finding ways to reduce attrition rates or study delays among diverse students. Risk factors for dropout include socialization and adjustment difficulties, as well as a lack of access to study groups or other forms of support (Christie, Munro, & Fisher, 2004; Heublein, 2014; Rausch & Hamilton, 2006).

In response, many universities have added small group teaching to their curricula to involve students more closely in their study programs. Such tactics can support students’ social and academic adjustment if they facilitate the establishment of functional relationships with fellow students. One example of small group teaching is seminar groups. In seminars, students learn academic skills within a small peer group, and they obtain information about various topics. Similar to other types of small group teaching, such as learning communities, seminars aim to increase study success by fostering peer and faculty interactions (Hatch & Bohlig, 2016; Tinto, 1993). Research suggests that the resulting peer interactions and collaboration can enhance individual performance (e.g., O’Donnell, 2006; Pai, Sears, & Maeda, 2015; Webb, 1982). Seminar groups also can support the formation of effective peer networks to manage academic challenges, by creating opportunities for
interaction and the exchange of resources among fellow students (e.g., Borgatti & Lopez-Kidwell, 2011; Lomi, Snijders, Steglich, & Torló, 2011) and positively affecting academic outcomes (Thomas, 2000). There is thus a great need to understand the prerequisites and predictors of successful integration into academic peer networks.

Two kinds of cognitions relate closely to individual achievement in this context: growth mindsets (Burnette, O’Boyle, Van Epps, Pollack, & Finkel, 2013) and self-efficacy (Richardson, Abraham, & Bond, 2012). Growth mindsets reflect a general, optimistic perspective on capabilities and intelligence; they imply the belief that people can grow through their own effort. Self-efficacy instead pertains to students’ personal belief that they are capable of overcoming barriers in educational settings and attaining specific academic goals (Bandura, 1997). Accordingly, this study investigates whether these two cognitions also make students more appealing as exchange partners and advice givers among fellow students. The psychological significance of growth mindsets and self-efficacy beliefs is well substantiated empirically and for individual outcomes (e.g., motivation, achievement); their effect on peer relations has rarely been investigated. Using a data set of 580 bachelor’s and master’s degree students, this study examines the potential of “one can grow” mindsets and “I can do it” cognitions (Kraft, Rise, Sutton, & Røysamb, 2005) to make people more appealing as academic helpers, as indicated by their increased popularity among peers in academic support networks over time.

5.1.1. Growth mindsets and academic self-efficacy as predictors of perceived and actual popularity in peer networks

Social integration results from peer interactions (Tinto, 1993), that is, bidirectional processes that can be aptly described by sociometric nomination procedures. Individuals seek out connections to others in their network, and others seek connections with them (Thomas, 2000; Zander & Hannover, 2014). Integration into academic support networks can be assessed by self-reports, reflecting a person's self-perceived popularity among others in a given context (Mayeux & Cillessen, 2008) or by peer reports, which reveal how many others indicate they would turn to a particular person for help, advice, or collaboration, similar to indegree centrality in a network of peers. This indegree centrality corresponds with the person's actual popularity, and every additional relationship offers more opportunities for interaction and information exchanges (Borgatti & Lopez-Kidwell, 2011; Hanneman & Riddle, 2005). Because self-reports of peer popularity alone can be unreliable (Brown & Larson, 2009), the combination of both self-perceived popularity and indegree centrality measures (Hanneman & Riddle, 2005) offer a particularly appropriate method to uncover the dynamics of interpersonal relations and popularity in peer networks (Reitz, Motti-Stefanidi, & Asendorpf, 2016). For this study, we investigate actual and self-perceived popularity in academic and social support peer networks.

The powerful effects of mindsets are not restricted to self-regulated learning but also might affect interpersonal processes. Learners with fixed mindsets believe that everyone is equipped with a particular amount of intelligence or talent that cannot be changed. When encountering difficulties, these learners believe that their limit is reached, doubt their ability, and cease their effort (Blackwell, Trzesniewski, & Dweck, 2007). Some research
indicates that help-seeking and being helped evoke feelings of incompetence and fears of being evaluated as lacking in ability (Nadler, 2015). These cognitions correspond with a fixed mindset, in which failure implies a lack of ability and the superior performance of others appears threatening. Students with growth mindsets instead believe that intelligence is malleable and can be changed through hard work and instruction (Dweck, 1999). This makes them more motivated to learn, identify more strongly with academia, and perform better (Paunesku et al., 2015; Rattan, Savani, Chugh, & Dweck, 2015; Romero, Master, Paunesku, Dweck, & Gross, 2014).

Students with growth mindsets might perceive not only their own abilities as changeable but also those of their fellow students (Heslin & VandeWalle, 2008). A growth mindset leads the person to regard struggling help-seekers as on the path to successfully overcoming a challenge and enhancing their potential and abilities. People seek interpersonal relationships that offer support and help them develop their strength and autonomy in the face of adversity (Feeney & Collins, 2015), so growth mindsets may be particularly attractive qualities for potential helpers in learning environments. Being a popular helper in turn might pave the way to becoming a valued member in a weakly acquainted peer group: Having been helped motivates reciprocation, which can increase positive affect, thereby initiating mutually supportive relationships (Nadler, 2015; Spitzmuller & Van Dyne, 2013). Following Pollack, Forster, Johnson, Coy, and Molden (2015), as well as Feeney and Collins (2015), we argue that people turn to others for help when those others do not regard help seeking as an indication of poor competence but rather as an efficient strategy to grow and fully exploit one’s abilities. Ideally, helpers motivate help-seekers to stay in the game, use their strengths, and reframe the adversity as a mechanism for positive change and growth. We therefore propose that a growth mindset is a quality in potential helpers that is particularly appealing to others who seek out help and advice in an academic context. Mindsets are initially invisible to others, but over the course of a term, students advocating for a growth mindset likely emerge as more approachable exchange partners to the majority of students and thus become more popular in the academic support networks.

A similar concept that consistently facilitates adaptive responses to challenges in educational settings is academic self-efficacy. Similar to growth mindsets, students’ academic self-efficacy facilitates learning outcomes, through effort investments and persistence (Brouwer, Jansen, Hofman, & Flache, 2016a, 2016b; Richardson et al., 2012). Although similar, in that they both exhibit a future perspective, self-efficacy beliefs and growth mindsets actually differ in their target. Self-efficacy beliefs target the self. Growth mindsets instead are more general and target both the self and others. It might seem appropriate to ask for advice from a person who signals high self-efficacy (Siciliano, 2016), but plausibly, highly self-efficacious peers also might evoke threats and perceptions of incompetence in help-seekers, ultimately leading to avoidance (Nadler, 2015). We therefore refrain from specifying a prediction about how self-efficacy relates to students’ popularity.
5.1.2. The interplay between popularity in academic and social support peer networks

Peer relations in academia refer to the exchange of academic support, as well as social interactions with others to whom students feel attracted, on the grounds of liking and affection. In academic support networks, members exchange task-relevant information, advice, and practical support. In social support networks, similar to friendship networks, relationships are not necessarily study-related or task dependent but rather provide personal and emotional support, which may reduce stress or ease problematic situations (e.g., Zhu, Woo, Porter, & Brzezinski, 2013). Social support networks are based on affection and sympathy (Zander, Kreutzmans, West, Mettke, & Hannover, 2014). Opportunities or needs to interact while working on a common task in a university setting in turn should give rise to the emergence of sympathy and liking, such that the social support networks grow denser over time. In this study, we measure students’ popularity in academic support networks but also in social support networks, so that we can examine their interrelation in cross-lagged analyses. Interactive seminars (cf. large lectures) provide many opportunities to approach classmates, such as to clarify class content or obtain relevant material. We anticipate that being approached for academic support increases interactions, which in turn can enhance feelings of sympathy over time. The proximity effect tends to lead to friendships and sharing personal issues (Fehr, 1996; Katz, Lazer, Arrow, & Contractor, 2004; Van Duijn, Zeggelink, Huismans, Stokman, & Wasseur, 2003; Wimmer & Lewis, 2010). Even if an interaction initially were motivated by a search for academic support, the relationship can be altered by positive affect, which increases feelings of sympathy and popularity in the social support network (Chen, Wang, & Song, 2012). The potential causal effect in the opposite direction also seems plausible though: Students who are approached for social support or regarded as friends might be regarded as academic helpers. Lomi et al. (2011) show that it is more likely that students provide academic support when they are also friends. Effective academic support presupposes academic competence, which does not necessarily correspond with popularity in social support networks (e.g., Nebus, 2006; Tomás-Miquel, Expósito-Langa, & Nicolau-Juliá, 2015). According to social network research, it is more likely that people grow more closely connected and friendly, such as in social support networks, when they have similar background characteristics and academic capabilities (Flashman, 2012; McPherson, Smith-Lovin, & Cook, 2001). For effective academic support, it seems better to ask someone who is slightly more successful (Aleven, Stahl, Schworm, Fischer, & Wallace, 2003; Vygotsky, 1978).

5.1.3. Present study

We examine longitudinal links between students’ growth mindsets or self-efficacy beliefs, their self-perceived popularity, and their actual popularity, measured with self-reports and sociometric peer reports of both academic and social support peer networks in a university context, using a data set of 580 educational science students and students enrolled in teacher training across 24 university courses. We calculated a path model including (1) a growth mindset and self-efficacy beliefs as students’ personal characteristics, (2) students’ actual popularity in academic and social support peer networks at the beginning of the semester, and (3) students’ actual and self-perceived peer popularity in both kinds of
networks at the end of the semester. Following the reasoning in the previous sections, we tested several hypotheses. First, students with growth mindsets are more popular in academic support networks than students with fixed mindsets at the end of the semester, even after accounting for their popularity at the beginning of the semester. Second, students with higher self-efficacy perceive themselves as more popular in their academic and social support networks. Third, over time, actual popularity in academic support networks may strengthen students' actual popularity in social support networks, and vice versa.

5.2. Method

5.2.1. Participants
Participants were 580 students (68.2% female, 31.8% male) enrolled in the second semester of either a bachelor's educational science program (n = 384, 66.2%; N = 9 courses) or a master's program for prospective teachers (n = 196, 33.8%; N = 15 courses) in a large German university's Department of Education and Psychology. As estimated a priori, we set a power threshold of about .80 to detect medium effect sizes (Scherbaum & Ferreter, 2009). The average age of the participants was 25.65 years (SD = 5.26).

5.2.2. Design and Procedure
The survey data were collected in 30 seminars, conducted in parallel with the students' large-scale lectures. The average seminar includes 24 participating students (SD = 7) over the course of three semesters (Fall 2013/2014, Summer 2014, and Fall 2014/2015). Each group was assessed at two points in time: at the beginning (T1) of the semester and about 10 weeks later at the end (T2) of the semester. Students were informed that their participation was completely voluntary and that all data would remain anonymous.

5.2.3. Measures
The Cronbach's alpha coefficients for all the scales indicated satisfactory internal consistency, with a range from .70 to .86 (Table 5-1). For participants in Fall 2013/2014, measures of self-efficacy and self-perceived popularity in academic support and social support networks were not obtained in the first assessment, resulting in a high percentage of missing values on these variables in the overall sample (~60%). Accordingly, we excluded these measures from the analysis.7

7 For an unrelated research question, the longitudinal data set also included measures of perceived stress, interdependent/independent self-views, and seminar climate, which are not analyzed for the current study.
**Peer-perceived actual popularity**

At both T1 and T2, we measured students’ popularity in academic support networks with a sociometric procedure, which constitutes the state-of-the-art for peer popularity studies (Cillessen & Marks, 2011). Using a different roster for each type of popularity, students could nominate fellow students by placing a cross next to randomly assigned cover names. To maximize comprehensiveness, we also measured actual popularity in academic support networks, using two types of name generators in which students nominated all course mates whom they would ask for academic help or advice and preferred as collaborators. That is, students nominated all course mates whom they would approach to exchange course-related ideas or to receive supporting material during an assignment or for exam preparation, as well as those with whom they would like to collaborate in group work or small assignments. The indegree centrality, or participants’ actual popularity (Hanneman & Riddle, 2005), was calculated in Ucinet version 6.497 (Borgatti, Everett, & Freeman, 2002) for each person in both types of networks (Borgatti, Everett, & Johnson, 2013), then aggregated into a composite academic support popularity score. To obtain a composite score for actual social support popularity, we similarly combined standardized indegree centrality for two name generators in which students nominated all course mates whom they would approach to discuss personal difficulties and whom they regard as friends.

**Self-perceived popularity in academic support and social support networks**

At T2, self-perceived popularity in the academic support networks was measured. Students rated the extent to which they thought others regarded them as academic helpers or preferred collaborators on four items (e.g., “I think my fellow students in this course would contact me in case they had an academic problem”). On three additional items, students reported their self-perceived popularity in the social support networks based on affection measures (e.g., “I can imagine that my fellow students in this course like me”). Students responded on a scale from 1 (“strongly disagree”) to 5 (“strongly agree”).

**Growth mindsets**

Growth mindsets were measured using six items (Blackwell et al., 2007; e.g., “No matter who you are, you can always work on your talent and change it a good deal”). Students indicated their agreement with these items on a five-point scale (1 = “strongly disagree” to 5 = “strongly agree”). Four additional items from the German Assessment of Implicit Theories about Intelligence and Effort (Spinath, 2001) captured growth and fixed mindsets in higher education specifically (e.g., “Everyone who just works hard enough could be among the best students of his or her year”). Six fixed mindset items were recoded, so that higher scores consistently indicated growth mindsets. We assessed this measure at T1 or at T2 for students who were not present at the first assessment. Because mindsets are stable over time (Blackwell et al., 2007) and the Cronbach’s alphas (T1 $\alpha = .78$, T2 $\alpha = .74$), means, and standard deviations (T1 $M = 3.48$, $SD = .59$; T2 $M = 3.53$, $SD = .52$) were nearly identical in this data set, we combined them into a single score.
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**Academic self-efficacy**

Self-efficacy beliefs were assessed for all participants at T2, with six items from a validated and commonly used German scale by Jerusalem and Schwarzer (1999; e.g., “In my studies I am able to deal with difficult situations and requirements, if I make an effort”; five-point scale: 1 = “strongly disagree” to 5 = “strongly agree”).

5.2.4. **Statistical analysis**

To account for missing values, we imputed five data sets in SPSS version 23, using all available data to produce more reliable estimates (Van Buuren, 2012), which we then subjected to path analysis (De Leeuw, Hox, & Huisman, 2003; Little, Jorgensen, Lang, & Moore, 2014) in MPlus version 7.11 (Muthén & Muthén, 1998-2013). For the indirect effects, we report bias-corrected bootstrapped confidence intervals (Shrout & Bolger, 2002). As indications of good model fit, we note a non-significant chi-square test, a root mean square error of approximation (RMSEA) less than .06, standardized root mean square residual (SRMR) less than or equal to .08, and a confirmatory fit index (CFI) of at least .95 (Hu & Bentler, 1999; Kline, 2011). Participant data were nested in seminar groups, so we controlled for dependence using the COMPLEX option to adjust the standard errors.

### Table 5-1. Descriptive statistics, reliabilities, and bivariate correlations

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>α (n items)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Actual popularity in academic support networks T1</td>
<td>3.02</td>
<td>1.85</td>
<td>80 (2)</td>
</tr>
<tr>
<td>2. Actual popularity in academic support networks T2</td>
<td>3.15</td>
<td>2.02</td>
<td>82 (2)</td>
</tr>
<tr>
<td>3. Actual popularity in social support networks T1</td>
<td>.77</td>
<td>.97</td>
<td>79 (2)</td>
</tr>
<tr>
<td>4. Actual popularity in social support networks T2</td>
<td>.90</td>
<td>1.00</td>
<td>70 (2)</td>
</tr>
<tr>
<td>5. Self-perceived popularity in academic support networks T2</td>
<td>3.26</td>
<td>.61</td>
<td>86 (4)</td>
</tr>
<tr>
<td>6. Self-perceived popularity in social support networks T2</td>
<td>3.50</td>
<td>.59</td>
<td>76 (3)</td>
</tr>
<tr>
<td>7. Grow mindsets (T1/T2)</td>
<td>3.82</td>
<td>.54</td>
<td>77 (6)</td>
</tr>
<tr>
<td>8. Grow mindsets (T1/T2)</td>
<td>3.52</td>
<td>.57</td>
<td>76 (10)</td>
</tr>
</tbody>
</table>

**p ≤ .001; *p ≤ .05.**

5.3. **Results**

In addition to the reliabilities, we present the descriptive statistics and bivariate correlations between the variables in Table 5-1. The path model (Figure 5-1) derived from the described hypotheses fit the data well ($\chi^2(7) = 11.198; p = .13, CFI = .998, RMSEA = .033, SRMR = .035$). As predicted in our first research hypothesis, students who believe that intelligence or talent is malleable were significantly more popular among their course mates in the academic support networks at T2. Students with growth mindsets also received more peer
nominations in the social support networks at T2. In contrast, students' self-perceived popularity in academic and social support peer networks was unrelated to their mindsets. As predicted by our second research hypothesis, highly efficacious students perceived themselves as more popular, in both academic and social support networks. Whereas self-perceived popularity in academic support networks predicted actual popularity in the same networks at T2 ($b^{*\text{indirect}} = .03 [.01;.05]$), no such mediated effect arose for popularity in the social support networks. Instead, we observed a weak negative direct effect of high self-efficacy on the number of nominations in the social support networks at T2. Actual popularity in academic support networks increased over time. It also showed an indirect link, through students’ self-perceptions as a popular academic helper or as a preferred collaborator; this indirect effect was small but significant ($b^{*\text{indirect}} = .02 [.004; .034]$). Cross-lagged analyses confirmed partly our third hypothesis, namely, that actual academic help popularity at T1 is a strong predictor of actual popularity in social support networks at T2. Actual popularity in social support networks at T1 did not predict actual popularity in academic support networks at T2.

Fig. 5-1 Model of the effects of a growth mindset versus self-efficacy in academic support and social support networks at the beginning and end of the semester, showing standardized coefficients.

*Note. $p \leq .05$; all bold $p \leq .001$

### 5.4. Discussion

Social networks are essential for success in academia and beyond. Research has demonstrated various benefits of individual networking behavior, such as professional success in terms of economic profit (Pollack et al., 2015), enhanced academic motivation and attainment (Huang, 2009; Nichols & White, 2001; Wentzel, Battle, Russell, & Looney, 2010), and adjustments following life transitions (Butoe et al., 2007; Christie et al., 2004; Friedlander, Reid, Shupak, & Cribbie, 2007; Wilcox, Winn, & Fyvie-Gauld, 2005). Against this backdrop, we consider it pertinent to investigate personal characteristics that might
predict embeddedness in social networks and effective individual networking behaviors. In the context of university seminar students, we have examined the role of growth mindsets and self-efficacy in determining whether people become valued parts of their academic support networks. Growth mindsets, or the conception that people can change their level of intelligence and talent through effort and persistence, and self-efficacy beliefs, which suggest a person believes in his or her capability to perform at designated levels even in the face of challenges, are concepts strongly associated with adaptive individual management of challenges in academia (Feldman & Kubota, 2015; Parker, Halgin, & Borgatti, 2016; Paunesku et al., 2015). Yet to our knowledge, this longitudinal study is the first to investigate their potential impact on social relationships, as catalysts of peer- and self-reported popularity in academic support networks. Our research goals were to examine the associations of growth mindsets and self-efficacy beliefs on actual, peer-reported popularity in academic support networks (i.e., academic helpers, preferred collaborators) and social support networks (i.e., discussing personal issues, friends) in their seminar, while accounting for self-perceived popularity in the same networks. Finally, we have sought to clarify the longitudinal association of popularity in networks based on either academic or social supporting.

Three main findings emerge. First, the subjective conceptions of cognitive growth that students bring into their study groups are decisive for their status as advice givers among seminar mates at a later point in the semester—regardless of initial differences in popularity. As we predicted, growth mindsets directly facilitate people’s actual popularity in academic support networks, making them more appealing as advice givers in challenging situations. Students who believe that abilities can grow also are nominated more frequently in the social support networks of the seminar group at the end of the semester. It seems their fellow students not only appreciate them as peers to be approached when in need of academic support but also like them more. The positive effect of growth mindsets on students’ actual popularity is not mediated by their self-perceived popularity. Second, a different picture emerges for academic self-efficacy beliefs. Believing in one’s own capability to manage academic challenges contributed to students’ popularity as help givers, but only indirectly. Students with high levels of academic self-efficacy at the end of the semester perceive themselves as more popular in academic support networks, and this perception related to their actual popularity. Students with stronger self-efficacy beliefs also assume they are more asked for social support by their fellow students, but this type of self-perception was not associated with the actual number of nominations they received from fellow students in this network. The effect is consistent with evidence that metaperceptions, such as the perception of one’s own popularity, often are based on egocentric projections of self-views, rather than grounded in assessments of environmental information (Wallace & Tice, 2012). Our findings support an overall model in which students’ growth mindsets and self-efficacy contribute to their integration into academic support networks in different ways: Growth mindsets exert a direct effect on actual, peer-perceived popularity in academic and social support networks; self-efficacy functions through positive self-perceptions of one’s own status as an advice giver or preferred collaborator. Third, students who were more popular in the academic support networks at the beginning of the semester are more popular in the social support networks at the end of the term, but not vice versa.
In turn, the current research contributes to extant literature. In particular, a growing number of studies demonstrate that growth mindsets can catalyze academic attainment and persistence in the face of difficulty (Aronson, Fried, & Good, 2002; Claro, Paunesku, & Dweck, 2016; Dweck, 1999, 2006; Paunesku et al., 2015). To the best of our knowledge, this study provides the first direct evidence that these mindsets affect not just individual outcomes but also social dynamics—plausibly, by making beholders seem more appealing as helpers and advice givers among peers. We simultaneously investigate the role of self-efficacy, which does not contribute directly to a person’s actual popularity in the academic support networks, nor in the social support networks. On the contrary, we find a small negative effect of self-efficacy beliefs on students’ popularity in the social support networks, supporting the assumption that people who appear very self-confident in stressful situations, such as during exams, might prompt a sense of threat in others (Nadler, 2015) and may therefore not be approached for discussing personal matters or for friendship. Our findings indirectly correspond with those of Reitz et al. (2016), who find that students with high self-esteem believe themselves more popular, even when they are not in reality. For growth mindsets, the link to actual popularity instead is straightforwardly positive, such that they contribute to the mindset holder’s popularity in networks based on both academic and social support. This research thus combines self-reported and peer-reported data, in the form of sociometric nominations in seminar rooms, which may provide accurate measures of students’ actual popularity in naturalistic settings (Cillessen & Marks, 2011). Sociometric nominations are unbiased by self-presentation motives and allow firmer conclusions about existing associations between subjective experiences and interpersonal relationships (Fiedler, 2014). Finally, this study investigates longitudinal links between popularity in academic and social support networks. Considering people’s fundamental need to belong and feel competent (Baumeister & Leary, 1995; Ryan & Deci, 2000), our results suggest that appearing helpful to others from the start is an advantageous route to being accepted in a new, challenging environment. Students perceived as helpful and preferred as collaboration partners (i.e., academic support) by many others at the beginning of the semester are more approached for discussing personal issues or for friendship (i.e., social support) at the end of the term, yet popularity in social support networks does not evoke integration into the academic support networks.

5.4.1. Boundary conditions and research directions
Although this research examines a large sample of university students in real-world social contexts over the course of a semester, several limitations need to be acknowledged. First, self-perceived popularity and self-efficacy measures were not available for the first wave of students at the beginning of the semester and thus could not be included in our models. A fuller assessment of all the variables at multiple time points would offer a more detailed exploration of the mechanism, through the application of cross-lagged models. Second, the effects of growth mindsets on students’ popularity were subtle. The time lag between our two measures was only about ten weeks; extrapolated over an entire study program spanning several semesters, the strength of these effects might increase. Furthermore, in educational research small effect sizes seem quite common (see Hattie, 2009; Pajares,
It is interesting to speculate about what makes students with growth mindsets more popular. Because we did not measure students' views on help seeking or the frequency or content of actual help exchanges and cooperative responses, we can only presume that students with a growth mindset were more frequently selected as helping partners because they do not react in a negative or competence-threatening manner, refrain from social comparisons of the self and others, and provide effort-related (rather than ability-related) feedback when asked for help. Such behaviors can be subtle cues that convey to others that they consider help-seeking an essential, vital part of the learning process. Further research might investigate this underlying mechanism by including observational measures of network involvement.

The finding that a growth mindset, as a generally optimistic view, and self-efficacy indirectly influence a person’s attractiveness as an academic helper in the seminar groups may have some practical implications too. In addition to facilitating peer network building and perceived embeddedness, universities should pay attention to students’ cognitions. Teachers can give feedback and teach students to foster their growth mindsets and encourage the belief that effort can facilitate their academic success. Doing so will contribute to not just individual academic success but also the success of the group, because students will be more willing to help one another when they believe that doing so is worthwhile for increasing their capabilities. Further research should focus specifically on how teachers can foster growth mindsets and self-efficacy cognitions among university students.

5.4.2. Conclusions

Our findings show that students with growth mindsets are popular in the academic and social support networks at the end of the semester. Students with higher self-efficacy regard themselves as more popular in academic support networks; self-perceived popularity in turn positively predicts their actual popularity in the academic support networks. This expansion of previous knowledge about the effects of growth mindsets and self-efficacy extends the concept from individual to relational outcomes in a naturalistic academic context. It illustrates the process of integration as a complex interplay of perceived and actual opportunities for exchange and shows potential ways to proactively catalyze it—namely, through positive appraisals of challenging situations as opportunities for the self and others to grow.