



Academic self-efficacy, growth mindsets, and university students' integration in academic and social support networks



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ABSTRACT

Combining complete social networks and structural equation modeling, we investigate how two learning-related cognitions, academic self-efficacy and growth mindsets, relate to integration in support networks of 580 university students in 30 seminar groups. We assessed integration as popularity in academic support networks (being an academic helper and collaborator) and in social support networks (being a friend and resource for sharing personal difficulties). Perceived integration in both networks was measured with self-reports, whereas actual integration in both networks was measured with sociometric peer-reports. Structural equation modeling showed that students who were initially more integrated in academic support networks became more integrated in social support networks over time, but not vice versa. Students with higher academic self-efficacy perceived themselves to be an academic resource for others, which in turn enhanced peer-reported academic integration. Academic self-efficacy was related to growth mindsets and growth mindsets were related to actual integration in academic support networks.

1. Introduction

In most Western countries, including Germany, universities have added small group learning to their curricula to facilitate students' involvement in their study programs. An important form of small group learning is seminar groups where students acquire knowledge about various topics instructed by a teacher. Similar to other types of small group learning, such as learning communities, seminars aim to increase study success by fostering social and academic integration (Hatch & Bohlig, 2016; Pascarella & Terenzini, 2005; Springer, Stanne, & Donovan, 1999; Tinto, 1993, 2000). By creating opportunities for interaction and the exchange of resources among fellow students (e.g., Borgatti & Lopez-Kidwell, 2011; Lomi, Snijders, Steglich, & Torló, 2011), seminars can positively affect academic outcomes (Thomas, 2000; Tinto, 1975, 1993). Much research has shown that positive peer relations can enhance individual performance (e.g., O'Donnell, 2006; Pai, Sears, & Maeda, 2015; Webb, 1982), particularly when students form supportive peer networks with fellow students (Nebus, 2006; Smith, 2015; Tomás-Miquel, Expósito-Langa, & Nicolau-Juliá, 2015).

Yet, so far, little is known about individual differences in the extent to which students are able to establish these supportive networks in learning environments.

This study examines the relationship between social and academic integration and two learning-related cognitions as individual prerequisites for mastering the challenge of successful integration into these supportive peer networks: academic self-efficacy beliefs (Bandura, 1997; Chemers, Hu, & Garcia, 2001; Honicke & Broadbent, 2016) and growth mindsets (Burnette, O'Boyle, Van Epps, Pollack, & Finkel, 2013; Dweck, 1999, 2006). A peer network in academia can be used to exchange resources in academic as well as personal matters (Song, Bong, Lee, & Kim, 2015). Following Thomas (2000) and Smith (2015), in this study social and academic integration is conceptualized as students' embeddedness in networks of social and academic relationships with fellow students. Social integration is not necessarily study-related, but associated with the exchange of personal matters, for example with friends (Buote et al., 2007; Zhu, Woo, Porter, & Brzezinski, 2013), whereas academic integration is study-related and associated with the exchange of academic matters (Nebus, 2006; Tomás-Miquel et al.,

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2015). We propose that two learning-related cognitions, i.e., academic self-efficacy and growth mindsets, are not only related to individual learning but also that they can explain students' appeal as supporters for other peers learning and thus facilitate their integration into students' support networks. Students with strong academic self-efficacy beliefs believe that they are capable of overcoming barriers and academic goals in educational settings (Elias & MacDonald, 2007; Honicke & Broadbent, 2016). Growth mindsets reflect a general, optimistic implicit theory that intellectual talent is malleable rather than innate and fixed. Students entertaining growth mindsets believe that people's intellectual talent can grow in times of difficulty through the investment of effort (Chen & Pajares, 2010; Dweck & Leggett, 1988; Yeager & Dweck, 2012). This leads to the general research questions: To what extent are self-perceived and actual integration in academic and social support networks related and what is the role of academic self-efficacy and growth mindset in students' integration in both networks?

1.1. Supportive peer networks

Research on social support has consistently found that knowing about the available support from others is related to adaptive outcomes (for a review on perceived social support, see Lakey & Orehek, 2011). Within and beyond academic settings, individuals seek out connections to others for support in their network, and others seek support of them (Brouwer, Flache, Jansen, Hofman, & Steglich, 2017; Heaney & Israel, 2008; Thomas, 2000; Zander, Kreutzmann, & Hannover, 2017). Social integration into supportive peer relations thus results from bidirectional interactions (Tinto, 1993).

Integration can be assessed from different viewpoints: self-reported and peer-reported integration into academic and social support networks. On the one hand, a student can think that he or she is well integrated into a network with peers who can provide support for him or her. This *others-as-resource* perspective dominates in social support literature and is reflected in the assessments. For instance, researchers typically ask students to report the resources that are available to them. On the other hand, a student can think that he or she is well integrated into a network of peers who draw back on him or her for support. This approach, which we label the *self-as-resource-for-others*, namely, that most social resources are available to the people who themselves are popular in a given network (Lin, 1999). Given the strong tendency of reciprocity in peer networks (Gouldner, 1960; Heaney & Israel, 2008) it is likely that students who themselves are seen as providers of support by others in a learning context will be more effective in eliciting help and support from others when needed. Therefore, we reason that actual integration into support networks is more aptly reflected by the extent to which a student is integrated and recognized as a source of support by his or her peers. This can be done by asking a student's peers whether they would turn to this particular person for help, advice, or collaboration, i.e., a sociometric nomination procedure (Heaney & Israel, 2008; Smith, 2015). Hereby, the number of nominations by others, the so-called indegree centrality (Hanneman & Riddle, 2005) in a network of peers, serves as a proxy variable for integration. In the following, we therefore refer to peer-reported integration as actual integration.

In this research we seek an answer to the question whether actual integration in academic support networks precedes actual integration in social support networks, and vice-versa. Interactive seminars 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 friendships and sharing personal issues over time. The proximity effect also tends to lead to friendships and sharing personal issues (Fehr, 1996; Katz, Lazer, Arrow, & Contractor, 2004; Van Duijn, Zeggelink, Huisman, Stokman, & Wasseur, 2003; Wimmer & Lewis, 2010). Even an interaction initially motivated by a search for academic

support can be altered by positive affect, increasing integration in the social support network (Chen, Wang, & Song, 2012). The potential relationship in the opposite direction, however, also seems plausible: Students who are approached for social support or regarded as friends might be regarded as academic helpers as well. Lomi et al. (2011) and Brouwer et al. (2017) show that friends often also serve as a source of academic support. We therefore examined the interrelation of actual integration in these two types of networks.

Self-perceived popularity in peer networks can be assessed by self-reports, reflecting a person's self-perceived integration with others in the small group (Mayeux & Cillessen, 2008), i.e., the extent to which a student thinks he or she is perceived as a source of support by others (Zander & Hannover, 2014). Self-perceived integration is inherently in the eye of the beholder and may be important for the actual integration in peer support networks. Several researchers demonstrate that networks are influenced by members' beliefs (Kilduff & Krackhardt, 1994; Kilduff, Tsai, & Hanke, 2006; Kwon & Adler, 2014), which can create self-fulfilling prophecies. For example, perceived access to support may cause students to ask others for support and thereby create even more support (Brands, 2013; Kilduff et al., 2006; Lin, 1999). To understand actual and perceived integration in peer networks better, the interplay of perceived integration and actual integration thus should be taken into account. The combination of both indegree centrality measures (Hanneman & Riddle, 2005) and self-perceived popularity (Mayeux & Cillessen, 2008) is a particularly appropriate method to uncover the dynamics of interpersonal relations and integration or popularity in peer networks (Reitz, Motti-Stefanidi, & Asendorpf, 2016).

1.2. Academic self-efficacy and growth mindsets

Academic self-efficacy is a person's perception that he or she will succeed in a certain task or domain (see Honicke & Broadbent, 2016 for a recent systematic review). Students' academic self-efficacy can enhance feelings of preparedness for university and facilitate successful transitions (Byrne & Flood, 2005) and is related to academic achievement (Brouwer, Jansen, Flache, & Hofman, 2016; Honicke & Broadbent, 2016; Richardson, Abraham, & Bond, 2012). While self-efficacy can be influenced by others (Siciliano, 2016; Usher & Pajares, 2008), it is still unclear whether highly self-efficacious students are more attractive as providers of academic support. On the one hand, students entertaining these optimistic "I-can-do-believes" (Kraft, Rise, Sutton, & Røysamb, 2005) can serve as models to overcome challenges. So asking for advice from a person who signals high self-efficacy (Siciliano, 2016) can be appropriate. On the other hand, in a new learning environment students may feel insecure. So rather than serving as a successful model, asking someone for support who expresses high self-confidence in his or her ability to master challenges could evoke threats and perceptions of incompetence in help- and support-seekers, and ultimately leading to avoidance (Nadler, 2015). In the latter case, students may prefer to approach someone with similar self-efficacy beliefs or feelings (Townsend, Kim, & Mesquita, 2014).

Academic self-efficacy is a self-perception or person's belief in his or her own capability to perform at designated levels even in the face of academic challenges (Honicke & Broadbent, 2016) and may be related to self-perceived integration in the academic peer network (e.g., Brands, 2013). The higher the levels of academic self-efficacy, the more students may perceive themselves as popular or integrated in the academic network. Since students with higher levels of self-efficacy may believe that they have the capabilities to help peers academically, they may expect that fellow students turn to them for academic support.

Another concept that may facilitate adaptive responses to challenges in educational settings is a growth mindset. Implicit theories of intelligence, also labeled as growth and fixed mindsets, form a framework that people can use to make attributions and interpret everyday

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