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# The impact of social capital on self-efficacy and study success among first-year university students



Jasperina Brouwer<sup>a,\*</sup>, Ellen Jansen<sup>a</sup>, Andreas Flache<sup>b</sup>, Adriaan Hofman<sup>a</sup>

<sup>a</sup> Teacher Education, Faculty Behavioural and Social Sciences, University of Groningen, the Netherlands, Grote Kruisstraat 2/1, 9712 TS, Groningen, The Netherlands

<sup>b</sup> Department of Sociology, ICS, Faculty Behavioural and Social Sciences, University of Groningen, the Netherlands, Grote Rozenstraat 31, 9712 TG, Groningen, The Netherlands

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## ABSTRACT

University programmes increasingly implement small-group teaching, with the assumption that students' social capital fosters academic achievement. However, few studies address the impact of social capital on the study success of first-year students. The current study addresses this research gap, examining the extent to which social capital relates to study success for first-year university students and whether this effect differs for high-, average-, and low-achieving high school students. Survey data collected from 407 first-year university students' measure social capital in terms of family, faculty, and peers. Path analysis reveals that in contrast to family capital, peer capital (help seeking, collaboration, and fellow students' support) and faculty capital (mentor support) contribute positively to study success, indirectly through friendship or self-efficacy. For high achievers, compared with low achievers, friendship has a positive effect on study success during the first year. Small-group teaching seems beneficial for study success if it enhances students' social capital.

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## 1. Introduction

Universities increasingly implement small-group teaching to foster interactions between students and faculty, improve study success rates, and enhance the quality of education. These efforts are required in light of increasing enrolments in most Western countries (Beerens-Soo & Vossensteyn, 2009), which have resulted in not only larger student bodies but also more diversity in terms of students' background characteristics and achievement levels. Many students are at risk for attrition; in the Netherlands for example, nearly 9% of university students dropped out in 2011, and 28.1% experienced potentially problematic delays because they switched study programmes in their first year (Dutch Inspectorate of Education, 2013, 2014). Previous studies emphasize adjustment difficulties and lack of social support as key risk factors for attrition (Christie, Munro, & Fisher, 2004; Rausch & Hamilton, 2006).

As a potential solution, small-group teaching can help build social capital, and the associated interactions and collaboration can enhance individual performance (e.g., O'Donnell, 2006; Pai, Sears, & Maeda, 2015; Webb, 1982). Social capital refers to a person's access to valuable resources (e.g., information, advice, support) through social relations, which enables him or her to attain personal goals (Coleman, 1990a; Flap & Völker, 2004; Lin, 1999). It is similar to other forms of capital, in that it results in the achievement of certain goals that could not

otherwise be achieved (Coleman, 1988, 1990a). Social capital theory, which posits that networks of relationships support people's efforts to achieve various goals, also emphasizes the instrumental utility of investment in resources, such that people invest in relationships when they expect a valuable return (Lin, 1999). For this study, we investigate social capital among small groups of first-year university students, to expand on theoretical considerations of collaborative learning (O'Donnell, 2006) and meta-analyses of the effects of small group learning on knowledge transfer (Pai et al., 2015). In university contexts, resources might be derived from relationships with parents (family capital), friends and fellow students (peer capital), and academic staff (faculty capital), including shared information and financial, practical, and emotional support (e.g., Stack-Cutler, Parrila, Jokisaari, & Nurmi, 2015). The increasing use of small-group teaching in academic curricula in turn gives rise to the main question of our study: To what extent and how does social capital contribute to study success in the contemporary Dutch university context?

### 1.1. First-year students' social capital

In the school context, social capital relates positively to learning outcomes (Beaulieu, Israel, Hartless, & Dyk, 2001; Cemalcilar & Gökşen, 2014; Coleman, 1988, 1990b; Dufur, Parcel, & Troutman, 2013; Huang, 2009; Kao & Rutherford, 2007), but little is known about these effects in the university context or which dimensions of social capital contribute most to study success. Some relevant studies in this context suffer from two limitations: Either they use a specific sample of students, such as international students (Hendrickson, Rosen, & Aune, 2011;

\* Corresponding author.

E-mail addresses: [jasperina.brouwer@rug.nl](mailto:jasperina.brouwer@rug.nl) (J. Brouwer), [e.p.w.a.jansen@rug.nl](mailto:e.p.w.a.jansen@rug.nl) (E. Jansen), [a.flache@rug.nl](mailto:a.flache@rug.nl) (A. Flache), [w.h.a.hofman@rug.nl](mailto:w.h.a.hofman@rug.nl) (A. Hofman).

Mamiseishvili, 2012; Neri & Ville, 2008; Rienties, Héliot, & Jindal-Snape, 2013; Rienties & Nolan, 2014) or ethnically diverse student groups (Meeuwisse, Severiens, & Born, 2010), or they focus on only one or two dimensions of social capital, such as relationships with peers and/or staff (e.g., Brooman & Darwent, 2014; Christie et al., 2004; Rytönen, Parpala, Lindblom-Ylänne, Virtanen, & Postareff, 2012) or with peers and/or family (e.g., Cheng, Ickes, & Verhofstadt, 2012; Eggens, Van der Werf, & Bosker, 2008; Friedlander, Reid, Shupak, & Cribbie, 2007; Román, Cuestas, & Fenollar, 2008) or the effects of friendship (e.g., Buote et al., 2007; Wilcox, Winn, & Fyvie-Gauld, 2005) on adjustments after the transition to university. Relatively less is known about the relationship between a variety of social capital dimensions and study success in the university context (e.g., Etcheverry, Clifton, & Roberts, 2001).

Building social capital is particularly challenging during the transition from high school to university, when students may feel unsure in this new social situation. Besides meeting university requirements and adjusting to university life, they must build new social networks as they leave their high school teachers, often their parental homes, and former classmates (e.g., Clark, 2005). After this transition, fellow students, teachers, and friends may become more important than parental support, because the fellow students and professors meet more frequently, and students are physically distant from their parents if they move to a university city. For these students, building new friendships and perceived access to support from friends is important for their adjustment to university life during the first semester, more so than family support (Buote et al., 2007; Friedlander et al., 2007). In this stage of emerging adulthood, friends become the most important source of support and inform students' identity development, toward becoming young adults who are increasingly responsible for decisions and finances, independent of their parents (Arnett, 2004; Van Duijn, Zeggelink, Huisman, Stokman, & Wasseur, 2003).

#### 1.1.1. Family capital

The importance of social capital for improving learning outcomes changes over time, depending on the learning context and the student's developmental stage. Most studies conducted in educational contexts focus on parents as a beneficial resource. Achievement generally relates positively to parent-child and parent-teacher interactions, parental education, and parent-school involvement (Cemalcilar & Gökşen, 2014; Dufur et al., 2013; Huang, 2009; Kao & Rutherford, 2007). When students enter a university, especially if they move out of their parents' homes, such that the parents are not part of the students' daily lives, this role changes, and relationships with fellow students and instructors become paramount (Arnett, 2004; Van Duijn et al., 2003). During this transition, family support may help students deal with feelings of loneliness or adapt to the new situation, but over time, friends and fellow students at the university ultimately become more important (Wilcox et al., 2005). Many students remain financially dependent on their parents or other family members though (Arnett, 2004), and when families provide financial support, students can focus more on their studies and perform consistently during their first year (Cheng et al., 2012).

Parental knowledge about academia represents another valuable resource for first-year university students. First-generation students, whose parents and siblings have not attended a higher education institution (Dumais & Ward, 2010), may be less prepared for the transition to university than other students, including a lack of specific information about what to expect from the university. However, prior studies offer mixed results, such that dropout rates are higher among first-generation than second-generation students (Ishitani, 2006; Stage & Hossler, 2000), but no evidence affirms an effect of parental education on study progress (Van den Berg & Hofman, 2005).

#### 1.1.2. Faculty capital

Students can receive support from faculty and staff in the form of advice, information, and feedback, as well as guidance and motivation so

that students can complete challenging assignments. Research is inconclusive about the effect of interactions between student and staff on study success though. Some studies show a positive relationship of student-faculty interactions with a sense of belonging and study success (Brooman & Darwent, 2014; Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Meeuwisse et al., 2010), but Etcheverry et al. (2001) find a positive effect only of peer relationships on achievement, not of student-faculty interactions. Tao, Dong, Pratt, Hunsberger, and Pancer's (2000) investigation of the patterns of various forms of support on adjustment to university during the first semester shows that peer support increases while instructor support decreases over time. Apparently, as students get to know one another, they seek support from their fellow students rather than from faculty. Wang, Cullen, Yao, and Li (2013) find no significant effect of relationships with instructors on achievement, though they do note an effect of feedback seeking.

#### 1.1.3. Peer capital

Interactions with and social support from fellow students or friends is important for helping students adjust to the university setting and obtain social comfort (Buote et al., 2007; Deil-Amen, 2011), engagement (Zhao & Kuh, 2004), and study success (e.g., Etcheverry et al., 2001; Kuh et al., 2008; Robbins et al., 2004), as well as for informing their decisions to withdraw (Christie et al., 2004). Teaching in small groups encourages the development of peer capital, because students discuss and exchange information with their fellow students during classes or while collaborating on assignments. Because they interact more frequently, it is easier to establish and maintain friendly relationships (Fehr, 1996; Van Duijn et al., 2003; Wimmer & Lewis, 2010). Yet the actual contribution of peer capital to study success in a small-group teaching context is equivocal. On the one hand, interactions with fellow students contribute to study success when those others possess skills and knowledge that is complementary to that possessed by the focal student, norms of striving for good results predominate in the group, and trusting relationships exist among students, because these conditions increase the focal student's motivation and well-being (Neri & Ville, 2008). On the other hand, the effects of social capital depend on the group's prevailing attitudes and norms. Informal group norms that do not value studying may interfere with study success. Collaboration also might hinder study success if working together simply reduces students' workload and effort, or it may contribute to success if the students integrate their different learning perspectives and pool their diverse skills (Flache, 2003; Karabenick & Knapp, 1991).

#### 1.1.4. Prior achievement and self-efficacy

Social influence is an important mechanism in social capital building in small groups, but the relationship between social capital and study success during the first year may depend on the high school achievement level of incoming students. Androushchak, Poldin, and Yudkevich (2013) find a nonlinear effect of peer support on achievement. High-ability students obtained the most benefit from interacting with other high-ability fellow students, whereas low-ability students were not influenced by fellow students, nor did they affect other fellow students. Similarly, high-achieving students benefitted from peer support for their academic achievement, whereas low-achieving students had difficulties approaching peers to gain support (Todres, Tsimtsiou, Sidhu, Stephenson, & Jones, 2012; Vaughan, Sanders, Crossley, O'Neill, & Wass, 2015). Students at risk of dropping out also described low quality relationships with faculty (Whannell & Whannell, 2014) and indicated they did not know whom to approach for help or dare to ask (Cleland, Arnold, & Chesser, 2005). That is, students who need instructor support the most to succeed seem to lack this form of social capital. However, Arcidiacono and Nicholson (2005) find no differences across high and low achievers in terms of benefiting from relationships with high-achieving fellow students. The question thus remains: How does the level of prior achievement interact with different dimensions of social capital to affect study success in a university context with small-

group teaching? We expect that average achievers gain the most benefit from social capital for their study success, because high achievers do not have much room for improvement, whereas for low achievers, social capital cannot compensate enough for their poor results.

Finally, previous research does not address whether social capital directly affects study success or if the effect is at least partially indirect, through the effects of social capital on cognitive and emotional factors, which in turn account for study success. Self-efficacy in particular may be a student characteristic, through which the effects of social capital get mediated. Students enter university with beliefs about their ability to succeed, which represents their self-efficacy or expectancy (Bandura, 1977, 1997; Wigfield & Eccles, 2000). These beliefs may change over time due to experiences and can be influenced by interactions with others, such as through vicarious experiences or encouragement, as are available through the mobilization of social capital (e.g., collaborations, seeking help or advice). Access to social capital also might enhance positive emotions (Lin, 1999; Usher & Pajares, 2008), such as feelings of confidence and self-efficacy. Therefore, social capital should exert impacts on the level of self-efficacy, and subsequently, self-efficacy may influence study success (Brouwer, Jansen, Hofman, & Flache, 2016a, 2016b; Richardson, Abraham, & Bond, 2012; Robbins et al., 2004). To understand the impact of social capital on study success, it is necessary to control for possible direct and mediating effects of self-efficacy.

## 1.2. Current study

The increasing extent to which small-group teaching is implemented in academic curricula gives rise to the following research questions for our study:

1. To what extent and how do different dimensions of social capital (i.e., family, peer, and faculty capital) contribute to self-efficacy and study success during the first year in the contemporary Dutch university context with small-group teaching?
2. What is the role of prior achievement (i.e., high school grades) in the social capital of first-year students?

Fig. 1 graphically presents the hypothesized direct and indirect effects predicted by the preceding theoretical considerations.

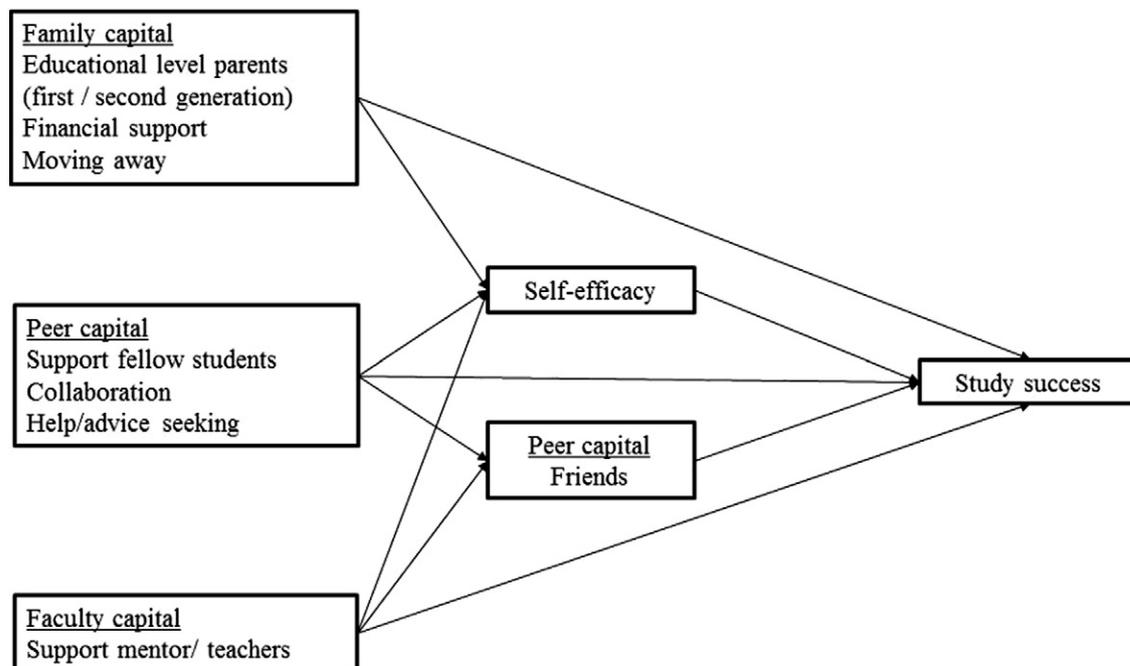


Fig. 1. Hypothesized direct and indirect effects of social capital on study success.

## 2. Method

### 2.1. Participants

The data for the current study came from a longitudinal data collection at a research university in the northern Netherlands with approximately 30,000 students (University of Groningen, 2014). The social science study programmes rely on small-group teaching, in relatively small, stable groups of 12–14 students, within which first-year students follow one or more courses during their first semester or year. The sample consisted of 407 first-year bachelor's degree students from the social sciences programmes Pedagogical Sciences, Psychology, and Sociology. Participants' average age was 19 years ( $SD = 2.0$ ), and the sample included 91 men (22%) and 316 women (78%). The students were predominantly Dutch (398; 98%), living away from home (273; 67%), and second-generation (354; 87%), which means that one of their parents or siblings had undertaken higher education. The sample was representative of the overall population of 589 first-year social science students, whose gender breakdown was 20% male and 80% female and whose mean age was 20.0 years ( $SD = 2.0$ ). In accordance with the regulations of the Central Committee on Research Involving Human Subjects (CCMO) in the Netherlands, the ethical committee of the departments responsible for the degree programs approved the current study, with the conditions that the data would be processed anonymously and that the students gave informed consent regarding their participation and the release of centrally registered study results.

### 2.2. Procedure

All first-year students of the Behavioural and Social Sciences department were asked to participate. During the introductory week of their study program, the students were informed verbally about the aims, procedure, and ethical aspects of the current study. In addition to the verbal information, students received a written summary of the research project. Participation was voluntary, and students were asked for informed consent to participate and use their study results and personal details. We excluded 19 students who did not give their informed consent to release their obtained grades.

The survey data were collected in September 2013 and January 2014. The first survey asked, in the following order, for their background characteristics, living situation (i.e., whether they moved out of their parents' house), financial support, and whether they were first-generation students. The second survey then included questions about self-efficacy, mentor support, and fellow students' support, as well as nomination questions about preferences for collaboration, help or advice seeking, and friends, in that order. Both surveys were provided to the students in Dutch, and the amount of time to complete both surveys ranged from 20 to 30 min. Students were rewarded with either a monetary reward or extra credit points at the end of the academic year. We obtained information about students' age, gender, and prior achievement from the central administration of the University of Groningen. We used secondary school exam grades on three mandatory core subjects, Dutch language and literacy, English language and literacy, and math, as an indication for prior achievement, because research shows that the results would be the same as if we averaged over all complete exam subjects (Severiens et al., 2011). The minimum entrance requirement into this university is a 5.5 overall average exam grade in secondary school, on a scale from 1 to 10. The response rate for the first survey was 69% ( $N = 407$ ), and that for the second survey was 62% ( $N = 364$ ). For both surveys combined, the dropout rate was about 10% ( $N = 43$ ).

### 2.3. Measures

#### 2.3.1. Family capital

We classified students as first-generation if they indicated that neither their parents nor their siblings received a higher education, using the items, "Do one or both of your parents have a higher education diploma?" and "Among your siblings, are you the first in your family to study at a higher education level?" Being a *first-generation* student, *moving out*, and *financial support* from family were dichotomous indicators of family capital.

#### 2.3.2. Faculty capital

*Mentor support* (five items;  $\alpha = 0.75$ ) as an indicator of faculty capital was measured with questions about the emotional and academic support provided by faculty staff, including "The mentor or study advisor is available to me" and "I talk to my mentor about my personal situation." The items came from an academic interaction scale used in previous studies in the Dutch university context (Meeuwisse et al., 2010; Severiens, Ten Dam, & Blom, 2006). Students responded on a scale from 1 ("strongly disagree") to 5 ("strongly agree").

#### 2.3.3. Peer capital

For peer capital, we used four indicators. *Fellow students' support* or peer support (eight items, 1 = "strongly disagree" to 5 = "strongly agree";  $\alpha = 0.83$ ) is the extent to which students provide one another with social and academic support, according to items adapted from social interaction scales (Meeuwisse et al., 2010; Severiens et al., 2006). We adapted these items to a university small-group teaching context, such as, "Fellow students listen to my comments" or "I work well with fellow students." In addition, *friends*, *help/advice seeking*, and *collaboration* were measured using nomination questions to indicate peer social capital. That is, each respondent could nominate up to 24 fellow students as supporters: their complete study group (12–14 students) and up to 10 additional students from the social sciences department. Students could identify these fellow students as "best friend," "friend," "friendly relationship," "neutral; not much in common," or "only known by face or name" (derived from Van der Bunt, 1999). For each respondent, we counted the number of times that he or she nominated a fellow student as a best friend, friend, or friendly relationship and summed the total, which provides the indicator for *friends*. For *collaboration*, we asked students to nominate fellow students as preferred for collaboration, with the item, "With this student [name] I would like to collaborate." *Help/advice seeking* was measured by a nomination

question that indicated, "I ask this student [name] for help when I do not understand the study material." The measures of collaboration and help seeking used five-point Likert scales (1 = "strongly disagree" to 5 = "strongly agree"). We summed the nomination of fellow students from "neutral" to "strongly agree" to indicate first-year students' access in their networks to collaboration and help/advice seeking. More access to resources may facilitate the use of these resources (Lin, 1999).

#### 2.3.4. Self-efficacy

We employed the expectancy scale from the widely used Motivated Strategy for Learning Questionnaire (Pintrich, Smith, Garcia, & McKeachie, 1991). Its components include items pertaining to control beliefs and self-efficacy for learning and performance (eight items;  $\alpha = 0.70$ ), such as "I think I will get good grades this block." Self-efficacy of learning and performance refer to participants' expectations that they have the abilities and skills needed to accomplish tasks or be successful in performing tasks. Control of learning refers to the belief that students can control their own academic achievement and that learning will lead to positive results (Pintrich et al., 1991). Students responded on a scale from 1 ("strongly disagree") to 5 ("strongly agree").

#### 2.3.5. Study success

Study success was measured as the weighted average marks (WAM<sub>i</sub>) achieved after the fall semester (*first semester study success*), spring semester (*second semester study success*), and first year (*first year study success*). Grades were weighted by the obtained credit points, divided by the maximum credits available in the corresponding period.

### 2.4. Statistical analysis

We had no missing values for the dependent variables of study success, gender, age, or prior achievement. For the independent 5-point Likert scale variables, the proportion of missing cases varied between 2% and 12%; this proportion rose to 40% for the three nomination questions. Little's MCAR (missing completely at random) test resulted in a significant chi-square, indicating that the data were not missing completely at random ( $\chi^2(56) = 124.43, p < 0.001$ ). We can assume these variables to be MAR (missing at random), because they relate to the observed data, not to the dependent variables (De Leeuw, Hox, & Huisman, 2003; Little & Rubin, 1987). We replaced missing data for the nomination variables by using AmeliaView version 1.6.4. to impute them over five repetitions (Honaker, King, & Blackwell, 2008). The descriptive statistics of the nomination variables were similar to those of the imputed variables, and the correlation was 1 (see Table 1).

We conducted path analysis in Mplus Version 7.2 (Muthén & Muthén, 1998–2013) to explore the hypothesized direct and indirect relationships of the conceptual model among social capital factors, self-efficacy, and study success at the two data collection points. Because students were nested in small groups, we controlled for dependency by using the COMPLEX option to adjust the standard errors. We also used maximum likelihood estimation with robust standard errors (MLR) to handle the MAR and non-normality of the data. The intraclass correlation (ICC) varied between 0.03 (self-efficacy) and 0.33 (mentor support); the design effect factor (ranging from 1.15 to 2.15) also confirmed that the standard errors would be underestimated if we ignored the nested data structure (for more details, see McCoach, 2010). We assessed the overall goodness of fit of the tested model with the following indices: the chi-square test, comparative fit index (CFI), root mean square error of approximation (RMSEA), standardized root mean square (SRMR), and Tucker–Lewis index (TLI). Indications of a good fit require non-significant chi-square test, RMSEA values  $< 0.06$ , SRMR  $\leq 0.08$ , and CFI and TLI close to or  $> 0.95$  (Hu & Bentler, 1999; Kline, 2011). For indirect and direct non-standardized effects, bias-corrected bootstrapped confidence intervals are reported (Shrout & Bolger, 2002). In addition to the path analyses, we conducted a multilevel analysis in MIWiN version 2.33 (Rasbash, Browne, Healy, Cameron, & Charlton, 2015) to

**Table 1**  
Bivariate correlations and descriptive statistics.

	Prior achievement	Self-efficacy/control	First generation students	Moving out	Financial support	Mentor/instructor support	Fellow students' support	Collaboration	Help/advice	Friends	Study success first semester	Study success second semester	Study success after 1 year
Prior achievement	1.00												
Self-efficacy/control	0.15*	1.00											
First generation students	-0.01	-0.02	1.00										
Moving out	0.01	-0.02	0.05	1.00									
Financial support	0.08	-0.01	-0.18**	-0.04	1.00								
Mentor/instructor support	-0.10	0.19**	0.05	-0.04	-0.11*	1.00							
Fellow students' support	-0.07	0.20**	0.07	0.08	-0.13*	0.31**	1.00						
Collaboration <sup>a</sup>	-0.08	-0.04	-0.11	0.05	0.07	0.04	0.15*	1.00					
Help/advice <sup>a</sup>	-0.11	-0.10	-0.01	-0.09	0.02	0.14*	0.14*	0.56**	1.00				
Friends <sup>a</sup>	-0.05	-0.10	0.04	0.11	0.06	0.13*	0.35**	0.43**	0.45**	1.00			
Study success semester 1	0.36**	0.20**	0.06	0.05	0.03	0.04	0.05	-0.01	0.04	0.16*	1.00		
Study success semester 2	0.27**	0.14*	0.05	0.07	0.05	0.06	0.05	-0.09	-0.04	0.13*	0.77**	1.00	
Study success 1 year <sup>b</sup>	0.31**	0.16*	0.06	0.07	0.02	0.06	0.06	-0.08	-0.02	0.15*	0.88**	0.97**	1.00
Mean	6.67	3.41				3.71	3.89	10.33	8.64	6.07	6.38	5.37	5.75
Mean (after imputation)								10.89	9.08	6.10			
SD	0.57	0.43				0.60	0.47	4.25	4.63	3.66	1.41	2.09	1.69
SD (after imputation)								4.16	4.67	3.41			
Minimum	5.33	2.13				1.40	1.38	0	0	0	0.63	0.00	0.32
Maximum	8.33	4.86				5.00	5.00	21	20	18	8.90	8.61	8.54

Note. Spearman correlation for the dichotomous variables first-generation, moving out, and financial support

\*  $p \leq 0.05$ .

\*\*  $p \leq 0.001$ .

<sup>a</sup> Correlation of 1.00 between the imputed variables and the same non-imputed variables: collaboration, help/advice, and friendship.

<sup>b</sup> Study success after the fall (first) semester, spring (second) semester inform success in the first year, which include the grades from both semesters.

examine the moderation effect of students' prior achievement level and social capital on study success over time (i.e., at the end of the first semester and at the end of the first year).

### 3. Results

#### 3.1. Descriptive statistics and correlation analysis

With a bivariate correlation analysis, we explored the relationships of self-efficacy and social capital factors with study success at two data collection points. We found positive and significant relationships for self-efficacy with social capital variables (i.e., mentor/instructor support, fellow students' support) and with study success at two time points. Friendship related significantly and positively to study success during the first year. Moving out was not significantly related to any other variable, so we did not include it in the model. We found a strong relationship for first semester study success and second semester study success ( $r = 0.77, p < 0.001$ ). Students achieved better outcomes in their first semester, on average, compared with their second semester. Being a first-generation student and getting financial support were negatively related; first-generation students were less likely to have outside financial support ( $r = -0.18, p < 0.001$ ). Highly educated parents were more likely to have higher socioeconomic status than less educated parents and more likely to offer financial support to their children (see Table 1).

#### 3.2. Path analysis

We used a stepwise process in the path analysis. First, we included all the proposed family, peer, and faculty capital variables. The complete model achieved the following fit indices:  $\chi^2(4) = 6.55; p = 0.16, CFI = 0.995, TLI = 0.958, RMSEA = 0.044$ ; 90% confidence interval (CI) [0.00; 0.10], and SRMR = 0.015. Second, after excluding non-significant results and including the indirect paths, the fit indices revealed that this parsimonious model fit the data well, although the chi-square test is significant:  $\chi^2(19) = 33.08; p = 0.02, CFI = 0.967, TLI = 0.955, RMSEA = 0.047$ ; 90% CI [0.02; 0.07], and SRMR = 0.054. Fig. 2 presents a graphic depiction of this model of study success; Table A1 in the Appendix A contains the unstandardized coefficients and confidence intervals. Family capital did not contribute to study success directly or indirectly, so we removed it from the model. Peer capital factors contributed indirectly through friendship, whereas faculty capital, in the form of mentor support, related to first semester study success through self-efficacy. Prior achievement (i.e., high school grades) related significantly to

first semester study success and self-efficacy, and self-efficacy was positively and significantly related to first semester study success. First semester study success also was highly predictive for second semester study success, and the peer and faculty capital variables had effects on success in the beginning but not at the end of the academic year, i.e. second semester.

In addition, we found several significant, indirect effects, for which we calculated 95% CIs with a bootstrap procedure with 1000 iterations. First, the data indicated indirect effects through self-efficacy for the relationships between prior achievement and study success after the first semester ( $b^* = 0.03, [-0.002; 0.06]$ ). Indirect effects were also evident through friendship for the relationship of study success after the first semester with help seeking ( $b^* = 0.05, [0.01; 0.09]$ ), preference for collaboration ( $b^* = 0.03, [0.01; 0.06]$ ), and peer support ( $b^* = 0.02, [0.01; 0.04]$ ). When students helped one another, preferred to collaborate, or provided emotional or practical peer support, they were more likely to become friends, which had a positive effect on their study success. In particular, if students helped one another, they became friends more easily ( $b^* = 0.31, p < 0.001$ ). The model explained 17.5% of the variance in study success after the first semester and 62.3% after the second semester, as well as 24.5% of the variance in friendship and 10.9% in self-efficacy, though the explained variance in self-efficacy was not significant. Overall, the standardized coefficients indicated that prior achievement, followed by self-efficacy, contributed most to explaining first semester study success, which in turn contributed the most to explain second semester study success.

#### 3.3. Social capital and study success for different groups during the academic year

After conducting the path analysis, we investigated the relationship between social capital and study success during the first year for different groups in terms of their prior achievement levels, as derived from their high school grades. Rather than using a continuous variable, which would not provide insights into the results for average achievers relative to high or low achievers, we trichotomized prior achievement. That is, we computed prior achievement as a factor with three categories: low achievers (mean prior achievement  $-1.5$  SD; comparable to D or F students in the United States), average achievers (mean prior achievement between  $-1.5$  and  $+1.5$  SD; comparable to B/C-level students), and high achievers (mean prior achievement  $+1.5$  SD; comparable to A students).

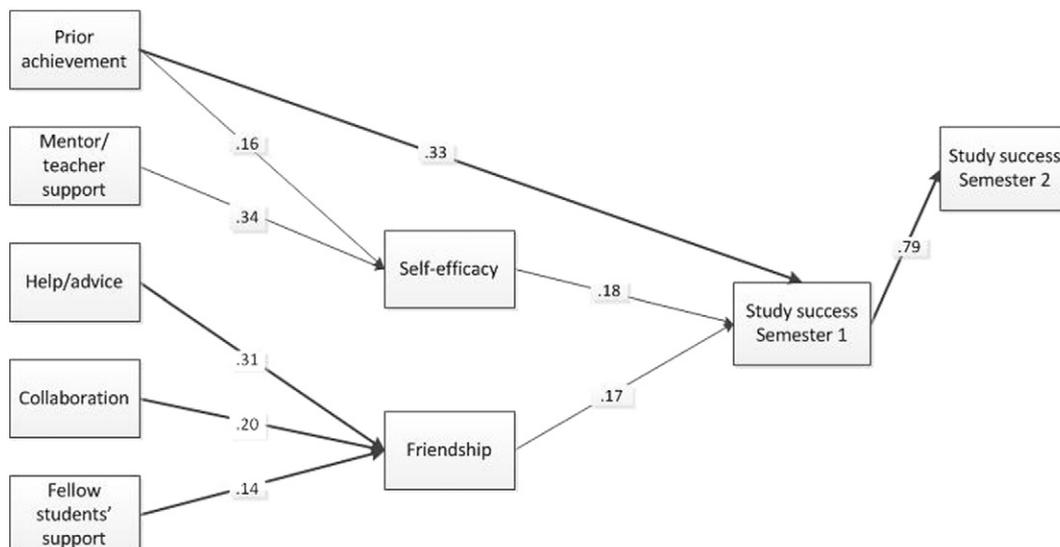


Fig. 2. Model of the relationships between social capital variables and study success. Note. Significant (boldfaced paths  $p < 0.001$ ) and standardized coefficients are displayed.

We conducted a multilevel analysis with first year study success as the computed dependent variable (i.e., first semester and end-of-year study success). The intercept of the null model was 6.07. Compared with the total variance, the ICC revealed that 5.60% of variance can be explained by differences across small groups of students. In model 1, mentor support (faculty capital) and friends (peer capital) were significantly and positively related. Preference for collaboration was significantly and negatively related to study success during the first year, which might imply that collaboration hinder study success when it reduces individuals' effort. Adding the interaction term for the significant main effects produced only a positive, significant interaction effect for friends and high achievers, relative to low achievers, on study success during the first year. The interaction terms for mentor support and collaboration with prior achievement did not relate significantly to study success and thus were removed from the final model. The final model offered a significant improvement compared with the null model ( $\chi^2(9) = 59.23, p < 0.001$ ) but not compared with the second model ( $\chi^2(2) = 4.26, p > 0.05$ ). In the final model, variance over time did not change. Excluding time, the final model explained 14.07% at the student level. That is, among high achievers, friends had a more positive effect on study success during the first year than they did for low achievers. A significant main effect of mentor support implied that it was beneficial for all students' success in the first year, independent of their high school grades. Small group teaching encouraged study success when it enhanced students' social capital (mentor support), but friends contributed most to study success for high achieving students (see Table 2).

#### 4. Discussion

To address the research gap regarding the effect of social capital on study success in university education with small-group teaching, we examined, first, the direct and indirect relationships among social capital, self-efficacy, and study success during the first year in a contemporary university context and, second, the extent to which this relationship differs for high-, average-, and low-achieving high school students. Our findings revealed that peer and faculty capital contribute directly or indirectly to the explanation of study success during the first year.

In contrast with primary or secondary school settings, in which family capital is generally more important than school capital (Dufur et al., 2013), we found that peer and faculty capital are more important than

family capital, particularly in terms of first semester study success. Help seeking, preference for collaboration, and support from fellow students contributed to study success indirectly through friendship, but only in the first semester. Then these semester results were predictive of second semester study success. Students with more social capital in the first semester ultimately enjoyed more study success. Similar to Lomi, Snijders, Steglich, and Torló (2011), we determined that the more students asked for help from their fellow students, the more likely they were to become friends; this friendship then offered an important mediator for help or advice seeking, fellow students' support, and first semester study success. The mentor contributed indirectly to first semester study success, through self-efficacy, in line with previous literature that indicates instructors can enhance self-efficacy by providing feedback or contributing to students' mastery experiences (Usher & Pajares, 2008).

We did not find support for the importance of family capital on study success, in that we did not uncover any significant effects for the family capital variables (educational level of parents, financial support, moving out). These findings could reflect the early, continual selection processes for children during their primary and secondary education in the Netherlands. Germany uses similar pre-selection processes, and comparable results have been reported (e.g., Crul, 2015). When students do not get support from their families, they likely fail to even reach the university level. Therefore, we might anticipate relatively minor differences in the family capital of students who have reached the university level.

Previous studies show that high achievers are more effective (Todres et al., 2012; Vaughan et al., 2015), and low achievers are less so, at building and using social capital; however, prior research has not addressed average achievers. We found that students' achievement level interacted with the effect of friendship on study success. For high achievers, friendships contributed more to study success than they did for low achievers, in contrast with our expectation that average achievers would benefit most from social capital. This result instead is consistent with previous studies that indicate high achievers benefit more from social capital than low achievers (e.g., Androushchak et al., 2013). Apparently in small-group teaching settings, for low and average achieving students, friendship does not contribute to their study success. Building friendships or belonging to a peer group often is based on similar characteristics (McPherson, Smith-Lovin, & Cook, 2001) and

**Table 2**  
Results of the multilevel analysis for study success during the first year.

	Model 0	Model 1	Model 2
	B (SE)	B (SE)	B (SE)
<b>Fixed effects</b>			
Intercept	6.072** (0.093)	4.642** (0.335)	4.366** (0.373)
Mentor support		<b>0.373* (0.122)</b>	<b>0.379* (0.121)</b>
Fellow students' support		0.008 (0.162)	−0.034 (0.163)
Collaboration		<b>−0.059* (0.020)</b>	<b>−0.059* (0.020)</b>
Help/advice		−0.016 (0.019)	−0.015 (0.019)
Friends		<b>0.056* (0.024)</b>	−0.121 (0.112)
<i>Prior achievement<sup>a</sup></i>			
Average achievers		<b>1.396** (0.338)</b>	<b>1.672** (0.374)</b>
High achievers		<b>2.358** (0.400)</b>	<b>2.752** (0.442)</b>
Average achievers * friends			0.177 (0.112)
High achievers * friends			<b>0.288* (0.139)</b>
<b>Random effects</b>			
Time	0.514 (0.036)	0.514 (0.036)	0.514 (0.036)
Student	1.863 (0.158)	1.566 (0.137)	1.542 (0.135)
Small groups	0.141 (0.081)	0.172 (0.081)	0.180 (0.083)
<b>Model fit</b>			
Deviance statistic (−2 * log-likelihood)	2642.627	2587.656	2583.396
Estimated parameters	4	11	13

Note. Adding the interaction terms, mentor support \* prior achievement or collaboration \* prior achievement, produced non-significant effects, so they were deleted from model 2. Predictors are centered around the grand mean. Bold font indicates significant estimates of the predictors.

\*  $p \leq 0.05$ .

\*\*  $p \leq 0.001$ .

<sup>a</sup> Prior achievement: low achievers is the reference category.

achievement levels (Flashman, 2012; Kiuru et al., 2011; Nichols & White, 2001). According to Lomi et al. (2011), it is more likely that students become friends when they are similar in their achievement level, but students also become more similar in their achievement levels over time. When low achievers become friends with other low achievers, it may not have any beneficial effects on their study success, whereas study success could increase if high achievers befriend one another. Further investigations of the impact of academic status on friendships might help determine whether low achievers have high-achieving friends or if only high achievers have high-achieving friends.

Other suggestions for further research stem from some limitations of this study. First, we focused specifically on access to social capital; according to Lin (1999), the mobilization or use of social capital can be even more important for study success. Second, we considered the number of friends, rather than the network structure. Network density influences the availability of support and information in a friendship or student network. Further research should investigate the social network structure to provide a more complete picture of the dynamics of social capital and the effect on study success in students' networks. Social capital is embedded in relationships with others, but it remains unclear whether students' achievement is the result of building social capital, an antecedent, or both (Vaughan et al., 2015). Assessing social capital from a longitudinal network perspective may illuminate the concept more completely and allow for a better understanding of its connection to academic achievement. Third, we measured support using self-reports; self-reports combined with qualitative research would provide more detailed insights into the interactions between students and their support networks over time (e.g., Bolger, Davis, & Rafaeli, 2003). Fourth, the representativeness of the sample was limited to students from the Behavioural and Social Sciences department at one university. It would be useful to replicate the study in different environments to generalize the results.

Our findings also have some practical implications. First semester study success is highly predictive of later success, indicating the need to support students from the very beginning. Early study failures may lead to a downward spiral of low self-esteem or discouragement (Reichert, 2007; Wigfield, Byrnes, & Eccles, 2006). Our findings also suggest a reinforcing effect of peer capital, the so-called Matthew effect, such that high achievers, compared with low achievers, become even more successful through their friends, possibly as a result of the selection of friends with similar achievement levels (e.g., Merton, 1968). Universities thus should pay attention to their social environments. Organizing social activities might help develop social competence, establish friendships and foster support among fellow students, which will increase study success. Another way to adapt the social environment to students' needs is to implement small-group teaching. Consistent with Rausch and Hamilton's (2006) recommendations, interventions such as pairing students to work together, encouraging group work, and allowing peer tutoring during classes seemingly can foster students' social capital and enhance study success (Baldwin, Bedell, & Johnson, 1997). Low achieving students need help to find social capital that contributes to their performance, so universities might actively implement peer-assisted learning within small group teaching contexts (e.g., Baker, Gersten, & Lee, 2002; Furnedge, Iwata, & Gill, 2014). Furthermore, instructors and mentors should provide positive feedback to help increase students' self-efficacy (Parker, Halgin, & Borgatti, 2016; Usher & Pajares, 2008), social capital, and study success (e.g., Brouwer et al., 2016a, 2016b; Richardson et al., 2012). Parker et al. (2016) note that performance feedback, which affects self-efficacy, can prompt people to reconsider how to manage their social resources. People who receive positive feedback employ their social resources even more; those who receive negative feedback rely on their limited resources, without expanding their social capital. Further research in university contexts might consider the impact of the social environment and performance feedback from instructors and mentors on students' self-efficacy and social capital.

Overall, beyond paying attention to academic demands, enhancing social capital by peers and academic staff is essential for improving self-efficacy and study success. Our findings show that implementing small-group teaching can be beneficial for study success, if it successfully enhances social capital among students.

## Appendix A

**Table A1**

Summary of unstandardized coefficients for the final model (Fig. 2).

	Unstandardized coefficients	Standard error	95% confidence interval	
			Lower bound	Upper bound
Self-efficacy <sup>a</sup>				
Prior achievement	0.11*	0.05	0.01	0.20
Mentor support	0.14**	0.04	0.08	0.22
Friends <sup>a</sup>				
Help/advice	0.22**	0.05	0.13	0.31
Collaboration	0.16**	0.04	0.05	0.25
Fellow students' support	0.60**	0.10	0.42	0.81
Study success after semester 1 <sup>a</sup>				
Prior achievement	0.64**	0.09	0.46	0.83
Self-efficacy	0.52**	0.16	0.16	0.84
Friends	0.07*	0.02	0.03	0.11
Study success after semester 2 <sup>a</sup>				
Study success after semester 1	1.17**	0.06	1.07	1.30

Note.  $N = 407$ .

<sup>a</sup> Endogenous variables.

\*  $p \leq 0.05$ .

\*\*  $p \leq 0.001$ .

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