School Ties: Social Capital and Student Performance in Individual and Group Tasks

Bryan R. Johnson, Matthew T. Seevers, and Todd C. Darnold

Purpose of the Study: This study seeks to understand the unique impact of social capital on student performance. We present hypotheses that link a student's social capital to his/her performance on individual and group tasks. In both task settings, we posit that social capital has a curvilinear relationship (inverted U-shape) with performance, such that students' performance is enhanced as social capital increases, but may exhibit declines if students over-invest in the initiation and development of their relationships

Method/Design and Sample: We surveyed undergraduate students—primarily marketing majors—enrolled in a required upper-level business course at a private, midwestern university. Using a questionnaire, we obtained roster-based, sociometric data on interpersonal ties for all 65 students enrolled in the course.

Results: The results partly support an association between a student's social capital and his/her performance. Specifically, we find evidence that the performance-enhancing effects of social capital (1) are evident in group tasks, rather than in individual tasks; and (2) may be best conceptualized as a curvilinear effect.

Value to Marketing Educators: The marketing literature exhibits a growing curiosity around the role of social networks and their impact on student effectiveness in the classroom and beyond. This study raises awareness of the unique role that a student's social capital plays in group task performance, as well as limitations on its effectiveness.

Keywords: Student Performance; Group Performance; Social Capital; Social Networks

Bryan R. Johnson, Assistant Professor of Marketing, Heider College of Business, Creighton University, 2500 California Plaza, Harper 4079, Omaha, NE 68178. Telephone: 402-280-3387; Fax: 402-280-5565; email: bryan@creighton.edu. **Matthew T. Seevers**, Associate Professor of Marketing, Heider College of Business, Creighton University, 2500 California Plaza, Harper 4090, Omaha, NE 68178. Telephone: 402-280-2093; email: matt.seevers@creighton.edu. **Todd C. Darnold**, Associate Professor of Organizational Behavior and Human Resource Management, Heider College of Business, Creighton University, 2500 California Plaza, Harper 4012A, Omaha, NE 68178. Telephone: 402-280-2887; email: todddarnold@creighton.edu.

A principal concern of scholarship and practice within the marketing education community is to determine and leverage factors that aid student performance. Prior research with an explicit focus on student performance has extensively focused on pedagogical factors (e.g., Camey, Gray, & Wert-Gray, 2008; Kennett-Hensel, Hensel, & Dellande, 2010; Vander Schee, 2009). Another category of factors affecting performance is student resources, which concern resources that vary at the individual-level and may be marshalled by a student to enhance his or her classroom outcomes. Investigations of student resources often focus on unique, personal characteristics embodied by the individual, such as intellect (Aggarwal, Vaidyanathan, & Rochford, 2004), personality (Poropat, 2009), motivation (Jaramillo & Spector, 2004), and learning style (Tom & Calvert, 1984). Recently, however, education scholars—and particularly those in marketing—have also shown increasing interest in student resources that stem from an individual's social ties, which have been shown to faciliate mutual support from classroom peers (Boostrom, Kurthakoti, & Summey, 2009) and to enhance a student's transition to professional life (Bacile, 2013; Bevelander & Page, 2011).

In the social sciences, the term capital is commonly used to describe resources that aid one's capacity for productive work (Gamarnikow, 2011). In recent decades, significant attention in marketing and other disciplines has been given to *social capital*, which is a unique form of capital and refers to the resources that flow from the structure and ties of an individual's network of relationships (Foley & Edwards, 1999; Nahapiet & Ghoshal, 1998). Social capital resides within the content and structure of the interpersonal ties that link an individual to others. Numerous studies have shown that social capital is positively linked to student achievement (e.g., Israel, Beaulieu, & Hartless, 2001), including grade point average (Baldwin, Bedell, & Johnson, 1997; Hwang, Kessler, & Francesco, 2004) and standardized test scores (Pil & Leana, 2009). Social capital has also been shown to facilitate job opportunities (Granovetter, 1973), enhance job performance (Seevers, Skinner, &

Dahlstrom, 2010), and improve career outcomes (Burt, 1998; Seibert, Kraimer, & Liden, 2001).

The purpose of this study is to better understand how students may benefit from the resources available from their social capital. This paper makes several important contributions. First, we extend and refine the capital paradigm in the marketing education literature to distinguish performance-inducing resources that are uniquely attributable to the student (e.g., human capital) from those that stem from a student's interpersonal ties (i.e., social capital) (cf., Gonzalez, Ingram, LaForge, & Leigh, 2004). Second, we present hypotheses that focus on the linkage between a student's social capital and his/her performance in individual and group tasks. In so doing, we posit that a student's social capital has a curvilinear relationship with performance, such that students' performance is enhanced as social capital increases, but may exhibit declines if students over-invest in the initiation and development of their relationships. Finally, we empirically test our hypotheses using sociometric data gathered from upper-level, university students.

BACKGROUND AND HYPOTHESES

The social capital construct borrows from the analysis of various other types of capital in the social science literature, such as physical (e.g., buildings, machinery), financial (e.g., wealth), and human (e.g., knowledge, skill). Capital refers to resources that may be leveraged in the production or acquisition of additional resources (Lin, 2001). For example, a retailer may invest existing financial resources to build a new distribution center in hopes of increasing profits. Likewise, an individual may invest personal resources (e.g., time, effort, and money) to pursue a professional degree that may lead to a job with enhanced responsibility and pay. In the case of social capital, the logic is similar. That is, a person may invest personal resources toward the development of social relationships in order to enhance social capital. In turn, these resources may be used to facilitate productive activity (Nahapiet & Ghoshal, 1998) and achieve higher returns on investments of other forms of capital (Burt, 1992).

More formally, social capital refers to the resources available from an individual's relationships, as well as the ties and structure of a social network that yield access to resources that aid productive activity (Foley & Edwards, 1999; Nahapiet & Ghoshal, 1998). Whereas human capital is an individual's self-embodied stock of resources that can be thought of as a person's *know-how* (Gamarnikow, 2011), social capital is embedded in the relationships that connect an individual to social resources within a network. Consequently, social capital is a person's *know-who*—it is derived from who a person knows and the nature of their ties to others. Social capital is also distinct from other forms of capital in that social capital is not the exclusive property of an individual; instead, its value to an individual may increase or decrease as one's relationships are developed or lost (Coleman, 1988). Examples of social capital resources have been showcased in the career success literature, and include receipt of job leads from one's acquaintances (Granovetter, 1973), task-related information from co-workers (Burt, 1992), and career sponsorship from mentors (Seibert et al., 2001). In the marketing literature, Seevers et al. (2010) has also shown that social capital contributes to receipt of positive word-of-mouth referral from industry peers, as well as influence in purchase negotiations.

Scholars have documented the impact of social capital on a wide host of outcomes for individuals, such as elevating social status (Lin, 1999), obtaining employment (Granovetter, 1973), improving workplace performance (Mehra, Kilduff, & Brass, 2001), securing positive career outcomes (Burt, 1998; Seibert et al., 2001; Seidel, Polzer, & Stewart, 2000), developing creative ideas (Burt, 2004), and advancing one's managerial ability (Burt, 1997). Numerous studies have also shown that group outcomes are enhanced by social capital. For example, social capital has been positively associated with group-level resource exchange and innovation (Tsai & Ghoshal, 1998), knowledge transfer (Inkpen & Tsang, 2005), organizational advantage (Nahapiet & Ghoshal, 1998) and performance (Dess & Shaw, 2001).

Based on the extent to which social capital has been shown to influence outcomes in a variety of individual and group settings, we expect social capital to contribute to student performance in both individual and group tasks. With the exception of Gonzalez et al. (2004), prior research on social capital in academic settings has rarely considered differences between performance in individual and group tasks. The marketing education literature, however, has long shown an interest in factors that contribute to individual performance (e.g., Camey et al., 2008; Russell et al., 2003; Vander Schee, 2009) and group performance (Bacon, Stewart, & Stewart-Belle, 1998; Corbin, 2002; Laird, Prince, & Spence, 2003). Accounting for these task contexts not only reflects the experiences encountered by students, but also provides a more nuanced understanding of the effects of student social capital. Because individual- and group-oriented academic tasks inherently require different levels of interaction and coordination with others, exploring performance in individual and group tasks is a logical next step. Additionally, because many students, upon entering the workforce, will be asked to perform individual tasks, as well as to collaborate with coworkers in group processes, it is increasingly important to understand the impact of social interactions on individual and group processes.

Theory suggests that the linkage between social capital and performance relies on an individual developing a sufficient number of ties (Freeman, 1979) at a sufficient level of emotional closeness (Granovetter, 1973). Holding many ties increases the likelihood that an individual will be connected to persons in otherwise unrelated social circles (Brown & Reingen, 1987), who offer exposure to positive

opportunities (Burt, 1992), as well as exposure to other individuals who possess diverse resources and perspectives (Lin & Dumin, 1986; Seibert et al., 2001). Many ties in an individual's network also increases personal prominence, which enhances perceptions of one's influence (Seevers et al., 2010). While holding many ties to others is necessary, doing so does not necessarily enhance outcomes unless an individual develops sufficient emotional closeness to benefit from the ties. Emotionally close ties are exemplified by high levels of solidarity, trust, and reciprocity (Brass, Butterfield, & Skaggs, 1998), which contribute to higher levels of cooperation (Rindfleisch & Moorman, 2001) and lower levels of interpersonal conflict (Nelson, 1989). Emotional closeness has been positively linked to the quality of information transferred between individuals (Frenzen & Nakamoto, 1993; Hansen, 1999; Uzzi, 1997). Information conveyed between close ties has also been shown to carry more weight in a receiver's decision-making (Brown & Reingen, 1987).

In academic contexts, we expect these same mechanisms to work together to enhance student performance in individual and group tasks. A student with many interpersonal ties has numerous peers with whom to corroborate their understanding of course expectations, materials, and assignments. In effect, casting a wide net enables a student to know who to turn to for missed notes, timely advice, and perhaps even assistance studying. Number of ties is also positively associated with receipt of emotional support from peers (Lakon, Hipp, & Timberlake, 2010), which is beneficial for students coping with various kinds of academic stress. However, in academic contexts, emotional closeness is also needed to activate the value of one's relationships. Emotionally close peers are typically more willing than emotionally distant peers to discuss course-related matters and to provide assistance, such as sharing notes. As a student develops stronger relationships, he or she gains genuine, cooperative access to valuable resources in the network (Frenzen & Nakamoto, 1993; Rindfleisch & Moorman, 2001). Emotionally close ties also enable and facilitate a student's interactions within a group, allowing the student to leverage his or her individual contributions, which in turn should help to enhance the group's performance. Ultimately, the quantity and emotional closeness of a student's ties work together to determine the strength of the student's network, providing access to social capital.

At the level of individual performance, prior studies support a positive linkage between social capital and academic achievement. Israel et al. (2001) identified social capital as a key factor affecting educational achievement among adolescents. Similar affects have been reported for undergraduate students (Hwang et al., 2004) and MBA students (Baldwin et al., 1997). To date, the impact of individual-level social capital on group performance has rarely been studied in an academic setting. Indeed, Baldwin et al. (1997) provide one of the only direct tests—finding support for a student's social capital on individual performance, but not for the performance of a student in a team setting. Regarding team performance, very little has been studied in academic contexts with respect to social capital. However, although only loosely related, in a non-academic context, Balkundi and Harrison (2006) find evidence that the individual-level social capital of a team member, in this case the team leader, can have a positive impact on team performance. Although our focus here is not on team leaders *per se*, this evidence supports the notion that a group member's social capital may positively impact the team's performance.

Although prior research supports a positive linkage between social capital and student performance, scholars have also identified the possibility of diminishing returns to increasingly large investments in social capital (Ellison, Steinfeld, & Lampe, 2011; McFayden & Cannella, 2004). Student performance may show initial performance gains as relationships to classmates are initiated and emotional closeness is developed; but performance may subsequently decline if students over-invest in the development of their social capital. Because the development of social capital is not costless, and often involves a significant investment of time and effort (Dunbar, 1996), one argument in support of diminishing returns is that the investments necessary for development and maintenance of a large interpersonal network come at the expense of activity that may be more directly related to completing academic tasks. In essence, students may be distracted—perhaps even willingly—by the increasing need for relationship management, which potentially causes their academic performance to suffer. A second argument, which is particularly germane to group tasks, is that increasingly close relationships to peers may suppress a group's openness to new information and diversity of thought (Nahapiet & Ghoshal, 1998). This may result in part from a growing "redundancy" of viewpoints within the group (Burt, 1992). At the same time, students may be motivated to avoid damaging relationships with group members, which may prevent them from challenging their classmates in the course of group activity.

While previous research has not directly examined the possibility of a curvilinear relationship between social capital and student performance, a number of studies indicate that there may be limits to the positive effects of social capital in a classroom setting. Ellison, Steinfeld, and Lampe (2011), for example, report a point of diminishing returns in terms of how increasingly large networks translate into social capital. Their findings demonstrate a curvilinear relationship between the number of connections reported by an individual and one's social capital, such that social capital recedes at increasingly high levels of network size. McFayden and Cannella (2004) also found a curvilinear relationship between performance and the number and strength of relationships that an individual maintains, as measured by new knowledge creation. From a group perspective, Hannan and Freeman (1988) posited a curvilinear relationship

between network density (i.e., the number of relationships among all members of a network) and firm survival. Dess and Shaw (2001) and Shaw et al. (2005) also report a similar relationship between organizational social capital and firm performance.

In sum, previous research—in academic and broader settings—supports the positive impact of social capital on student performance in individual and group tasks. We posit that students' social capital will enable them to locate and access diverse, performance-enhancing resources available through ties to their peers. We note, however, that the positive effects of social capital on student performance are not expected to be strictly linear, and may in fact be attenuated at high levels of social capital. Integrating these findings, we expect a curvilinear relationship (inverted U-shape) between a student's social capital and his/her performance on individual and group tasks. That is, performance gains are anticipated as students initiate ties and develop emotional closeness to classmates; but then, due to the many practical challenges of maintaining relationships, performance is expected to exhibit declines when students over-invest in relationships. Formally, we hypothesize:

- **H_1**: There is a curvilinear relationship (inverted U-shape) between social capital and student performance on individual tasks such that students perform better when their social capital is at intermediate levels than when it is at lower or higher levels.
- **H_2**: There is a curvilinear relationship (inverted U-shape) between social capital and student performance on group tasks such that students perform better when their social capital is at intermediate levels than when it is at lower or higher levels.

METHOD

Sample

The sample for this study consisted of all 65 undergraduate students—primarily marketing students—enrolled in a required upper-level business course at a private, midwestern university.[1] This research context offers multiple advantages. First, the focus on a smaller network enables complete network information about the relationships between participants. Second, the relationships among the students fall within a natural network boundary afforded by students' enrollment (or lack of enrollment) in a college course. Finally, the choice of a junior-level course was made such that students were far enough along in their program of study to exhibit variation in their interpersonal networks.

Data were collected by administering a paper-and-pencil survey during class time. The course instructor informed students that the aggregated, anonymous results would be used to support discussions in future class periods. To further increase involvement and interest in completing the survey, the instructor offered students extra credit for their participation. The resulting sample consisted of 37 males (57%) and 28 females (43%), with an average age of 21.3 years. As expected, most students indicated that that they held junior standing. The average student GPA was 3.45. Tables 1 and 2 provide descriptive statistics for the study sample, as well as the measures described below.

[1] Collecting relational data from all participants in a network often presents unique challenges that contribute to smaller sample sizes than those found in other research methods. Network investigators seek to document the nature of each participant's unique relationship with every other participant. In the current study, identifying the relationships among participants required assessment of 2080 ((n*n-1)/2) possible unique dyads among the 65 students. As sample sizes increase in network studies, the number of possible unique dyads increases exponentially. For these reasons, studies involving primary sociometric data collection are often characterized by smaller samples, typically involving fewer than 40 participants (Kilduff & Krackhardt, 1994; Krackhardt & Kilduff, 1990). The sample used in our study is fully representative of the network under investigation. In addition, it is also larger than the samples frequently used in network research.

Table 1
Descriptive Statistics of Study Participants

	Characteristics of Study Participants	Mean	S.D.	Min	Max
1	Age	21.31	0.84	19	24
2	Grade Point Average	3.42	0.37	2.21	3.97
3	Year in School	3.19	0.53	2	5

Table 2
Means, Standard Deviations, and Correlations

	Variable	Mean	S.D.	Min	Max	1	2	3	4
1	Individual Grade	196.7	15.9	147.4	221.3				
2	Team Grade	140.4	3.2	132	145	.28*			
3	Cumulative GPA	3.42	0.37	2.21	3.97	.77**	.33**		
4	Network Strength	28.5	12.8	5	56	.15	-.03	.11	
5	Gender	--	--	0	1	.01	-.32**	-.16	.10

** Correlation is significant at the p ≤ 0.01 level (2-tailed)
* Correlation is significant at the p ≤ 0.05 level (2-tailed)
N = 65

Measures

Dependent Variables. To capture students' classroom performance, we collected two distinct measures: individual grade and team grade. *Individual grade* was measured by summing each student's scores for the individual task assessments required for the course, which consisted of class participation and multiple written exams. Similarly, *team grade* was measured by summing each student's scores for the group task assessments necessary for the course, which included a group case analysis and group research paper.[2] Additional details regarding the individual and group tasks completed by students are provided in the Appendix.

Independent Variables. Based on our earlier discussion of the nature of social capital, we measure social capital as *network strength*, which simultaneously captures the number and emotional closeness of an individual's ties. To create the measure, we first collected relational data using sociometric questions in which participants reported on their relationships with fellow students. Participants were provided a roster of all students enrolled in the course and were asked about relationships to each fellow student. The survey was administered near the end of the term to allow students sufficient time (approximately 3 months) to develop ties with other students. The procedure followed recommended steps to enhance the reliability and accuracy of the network data. Specifically, we (1) provided students with a complete list of network participants to aid recall; (2) provided students with cues to define the types of relationships of interest; and (3) inquired about longer-term, stable relationships (Freeman, Romney, & Freeman, 1987; Wasserman & Faust, 1994). This information yielded a 65 x 65 affiliation matrix that accounted for 2080 ((n*n-1)/2) potential dyads. This matrix was used to map the student social network using UCINET 6 software (Borgatti, Everett, & Freeman, 2002).[3] Figure 1 provides a visual representation of the complete network among the 65 students.

For each name listed on the class roster, respondents were asked to rate their emotional closeness using a 3-point scale in which 1=acquaintance, 2=friend, and 3=close friend (Burt, 1992; Marsden & Campbell, 1984). Students were instructed to leave the question blank for classmates with whom they had no relationship—such ties were scored as a 0. *Network strength* was then calculated for each student by summing the emotional closeness

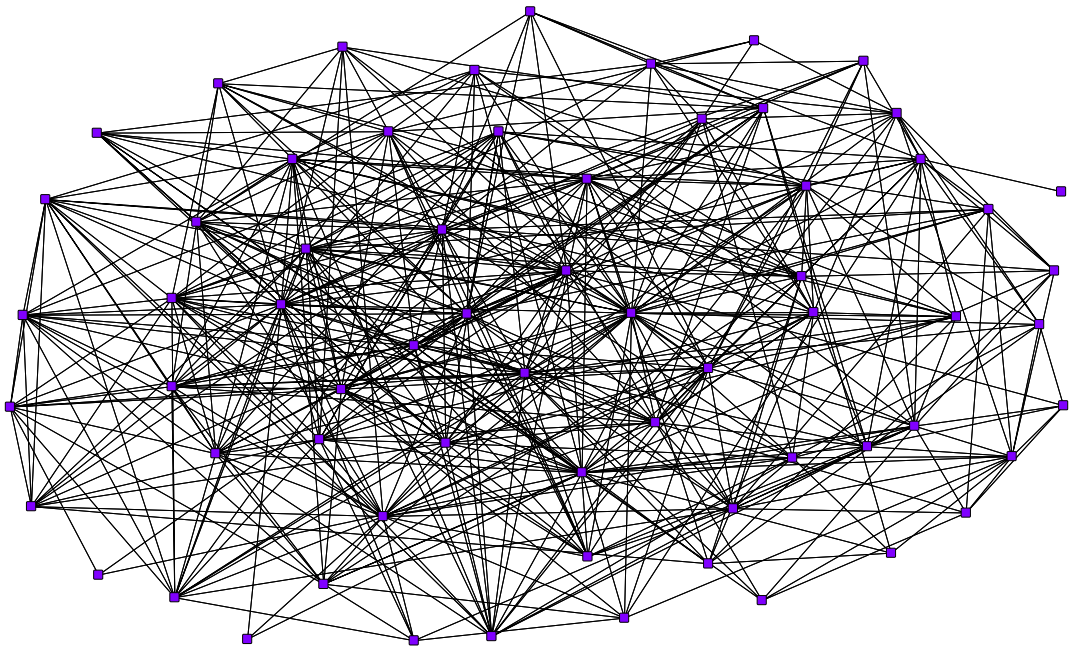
[2] Students in the same group did not always receive the same grade for their performance on group tasks; that is, in some cases, the instructor raised or lowered a student's grade to more accurately reflect their individual-level contribution to the group.

[3] Raw network responses were transformed using the "Symmetrize Maximum" function in UCINET (Borgatti et al., 2002), which sets emotional closeness for each dyad to the "maximum" level reported by either member of the dyad. In cases where one member of the dyad fails to report emotional closeness, this approach uses the rating of the other member of the dyad (i.e., the "maximum"). In our sample, 13 students did not report their relationships with others; thus, the emotional closeness of their relationships was determined by the rating of the other member of the dyad. To verify that this approach did not impact the results, we analyzed the data with and without these 13 students included in the analyses. We found that the results were virtually identical across models.

ratings across all fellow students in the class.[4] This approach yielded a singular measure of social capital that simultaneously captures both a student's quantity of ties and emotional closeness of ties, while also avoiding the problem of multicollineraity that may arise by including two measures of social capital in the statistical models used to estimate performance.

[4] For example, if a student had two 'close friends' (closeness=3, 2x3), four 'friends' (closeness=2, 4x2), and seven 'acquaintances' (closeness=1, 7x1), their network strength score is 6+8+7=21.

Figure 1
Social Network Diagram of Classroom Network



This diagram illustrates the complete social network among all students (n=65) in the sample. The boxes (nodes) depict individual students and the lines represent relationships between students. The diagram was prepared using Netdraw's (Borgatti et al., 2002) *node repulsion* and *equal edge length* algorithm, which places students with more shared ties closer to one another and students with fewer shared ties farther from one another. To improve clarity of the diagram, all lines that connect students are represented as equal distances.

Control Variables[5]. To account for the effects of possible gender differences in classroom performance (Gneezy, Niederle, & Rustichini, 2003; Nowell & Hedges, 1998), we included gender as a control variable (female=0, male=1). In addition, we also included students' cumulative GPA as a control variable to account for students' prior academic performance. This measure broadly accounts for the wide range of individual resources (e.g., intellect, knowledge, motivation) that can lead to variation in a student's academic performance and likely have bearing on the type of performance measured in the current study.

[5] We also estimated models that included a dummy variable to account for the section of the course in which the student was enrolled; however, this variable was statistically insignificant and it did not influence the results. Therefore, we removed it for parsimony and to increase clarity in our presentation of the statistical models.

Analysis and Results

To assess the influence of social capital on student performance, we estimated a series of hierarchical regression models to test *individual grade* (Models 1-3) and *team grade* (Models 4-6). The appropriate quadratic terms were added in each series of models to test for curvilinear relationships (Cohen et al., 2003). Specifically, we entered the explanatory variables into the models in three hierarchical steps: (1) the control variables, *GPA* and *gender*; (2) the social capital measure, *network strength*; and (3) the quadratic social capital measure, *network strength*^{2}. Regression results for how social capital impacts performance on individual tasks and groups tasks are presented in Table 3 and Table 4, respectively.

Table 3
Regression Results: Social Capital and Student Performance (Individual Grade)

	Model 1	Model 2	Model 3
Control Variables			
GPA *(Mean Centered)*	0.79**	0.79**	0.79**
	(3.40)	(3.44)	(3.45)
Gender	0.14	0.14	0.15
	(2.55)	(2.58)	(2.60)
Independent Variables			
Network Strength *(Mean Centered)*		0.05	0.03
		(0.10)	(0.11)
Network Strength^2 *(Mean Centered)*			0.08
			(0.01)
Model Statistics			
R^2	.614	.617	.622
ΔR^2	---	.003	.005
N	65	65	65

Table 4
Regression Results: Social Capital and Student Performance (Team Grade)

	Model 4	Model 5	Model 6
Control Variables			
GPA *(Mean Centered)*	0.29*	0.29*	0.28*
	(0.98)	(1.00)	(0.94)
Gender	-0.27*	-0.27*	-0.31**
	(0.74)	(0.75)	(0.71)
Independent Variables			
Network Strength *(Mean Centered)*		-0.04	0.07
		(0.03)	(0.03)
Network Strength^2 *(Mean Centered)*			-0.35**
			(0.00)
Model Statistics			
R^2	.184	.185	.295
ΔR^2	---	.001	.110
N	65	65	65

Coefficients are standardized. Standard errors are displayed in parentheses below coefficients.
Significance is based on 2-tailed tests: * $p \leq 0.05$; ** $p \leq 0.01$

.

To minimize problems with multicollinearity, we mean-centered the predictor variables associated with all of the polynomial terms before calculating them (Aiken & West, 1991; Cohen et al., 2003). Further, we examined the regression models for multicollinearity (Haab & McConnell, 2003). Diagnostics revealed that all variance inflation factors were well within acceptable limits, the largest being 1.4 (Hoffmann, 2004). In addition, diagnostics indicated that all condition indices associated with the eigenvalues were well within range (Hoffmann, 2004). The results of these tests indicate the absence of significant multicollinearity.

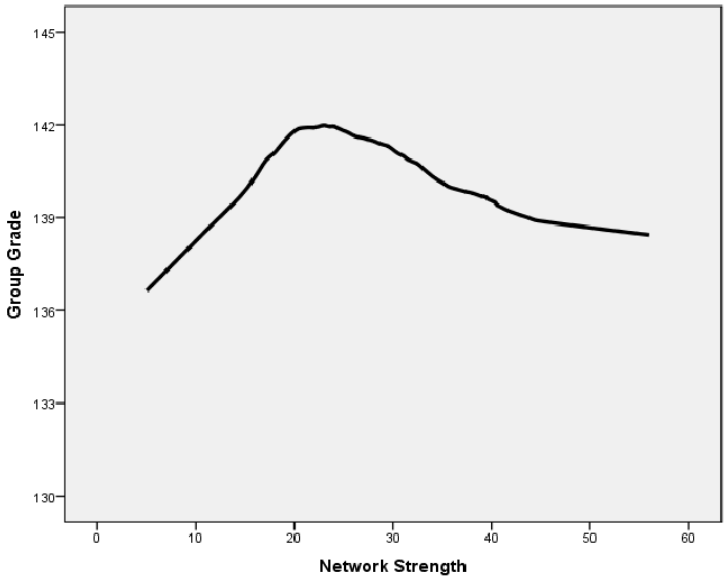
Hypothesis 1 posited that a student's social capital would have a curvilinear (inverted U-shape) relationship with performance on individual tasks. To

test H_1, we used hierarchical regression to test for a curvilinear relationship. We entered the control variables in step 1 (Table 3, Model 1), followed by the independent variable of interest, *network strength*, at step 2 (Model 2), followed by the quadratic term, *network strength*^{2}, at step 3 (Model 3). The baseline model with only control variables (Model 1) reaffirms the importance of individual resources—such as those reflected in one's cumulative GPA (β=0.79; p<.01)—as an important predictor of student performance. However, hierarchical analysis revealed that *network strength* was neither linearly (Model 2: β=0.05; p=.51), nor curvilinearly (Model 3: ΔR^2 = .005; β=0.08; p=.37;) associated with student performance on individual tasks. Thus, the data in our sample did not support H_1.

We further hypothesized in H_2 that student social capital would be curvilinearly (inverted U-shape) related to performance on group tasks, with students performing better at intermediate levels, rather than at high or low levels of social capital. To test H_2, we followed the same hierarchical regression approach outlined previously to investigate the presence of a curvilinear relationship between *network strength* and *team grade*. We tested for a curvilinear relationship by entering the variable of interest in three steps. We began by entering the control variables *gender* and *GPA* at step 1 (Table 4, Model 4), followed by the variable *network strength* at step 2 (Model 5), and the quadratic term *network strength*^{2} at step 3 (Model 6).

Again, the baseline model which included only control variables (Table 4, Model 4) reaffirms the impact of individual student resources, as reflected in GPA (β=0.29; p=.02), on student performance related to group tasks. Additionally, in this context we also found gender (β=-0.27; p=.02) to be a significant predictor of student performance on group tasks in our sample, with females (coded 0) outperforming males (coded 1).

Figure 2
The Curvilinear Relationship between Social Capital and Group Task Performance



Regarding the variables of interest, the hierarchical regression approach used to test the curvilinear relationship between social capital and student performance on group tasks provided strong support for H_2. The change in R^2 from Model 5 to Model 6 associated with step 3 was statistically significant (ΔR^2=.11; p<.01), indicating improved fit for the model with the quadratic term *network strength*^{2} (Model 6) over the model without the quadratic term (Model 5). Additionally, the quadratic term, *network strength*^{2}, was a statistically significant predictor (β= -0.35; p<.01) of *team grade*, indicating a curvilinear relationship between social capital and performance on group tasks as posited in H_2 (Cohen et al., 2003). Finally, to determine the direction of the curvilinearity, we assessed the valence of the coefficient associated with the quadratic term (Cohen et al., 2003). Our analysis indicated that the coefficient for the quadratic term *network strength*^{2} was negative, confirming an inverted U-shaped curve (Cohen et al., 2003), as posited in H_2. As visual evidence, Figure 2 depicts the curvilinear relationship[6] found between *network strength* and *performance,* demonstrating that performance on group-level tasks is highest when a student possesses intermediate levels of social capital, as opposed to either higher or lower levels of social capital. Collectively, these findings provide strong support for H_2, substantiating a curvilinear (inverted U-shape) relationship between social capital and student performance on group tasks in our sample.

[6] We graphed the relationship between *network strength* and *team grade* in Figure 2 using a Loess fit line incorporating a Triweight kernel.

DISCUSSION

Prior research in academic contexts has shown that social capital is an important asset available to students that may complement individual resources. The current study serves to highlight the unique impact of social capital on student performance. We find that a student's social capital impacts academic performance above and beyond other factors. Specifically, the effects of social capital on performance are present even after statistically controlling for the effects of individual student resources, as reflected by a student's prior academic performance (i.e., cumulative GPA). Furthermore, we find in our sample that the performance-enhancing effects of a student's social capital (1) are evident in group tasks, rather than in individual tasks; and (2) that the effect of social capital on performance in group tasks may be best viewed as a curvilinear effect, such that students' performance is enhanced as social capital increases, but may exhibit declines if students over-invest in the development of their social capital.

Implications for Marketing Educators

While the results of this study corroborate the impact of individual student resources on student performance—which may come as no surprise to educators—the principal outcome of this study is to highlight the value of a student's social capital. What, therefore, might marketing educators do to actively manage the development of social capital and leverage its impact for student performance? As a starting point, we encourage educators to consider strategically measuring and monitoring the social capital of students to assemble teams that optimize the social capital of group members. Applying the same class roster method used in this study would allow educators to quickly and accurately measure each student's level of social capital in the classroom network, and then assign students to groups accordingly. In this regard, educators could level the playing field by creating teams with balanced levels of social capital and limiting the creation of teams at a significant disadvantage due to suboptimal levels of social capital.

Given the nature of our findings, we also encourage educators to take a more deliberate role in helping students optimize their social relationships in the classroom (Gonzalez et al., 2004). To encourage all students to develop their network strength to a level sufficient to enjoy performance benefits, one practical method is to provide students with opportunities to interact inside and outside of the classroom. This might include in-class activities that are dedicated to facilitating interaction, such as break-out sessions in which students are able to meet and work with new students. Other alternatives might involve in-class team building activities or activities outside of class in which students are required to interact and get to know each other at a deeper level. Educators might also consider measuring each student's social capital early in the semester to help pinpoint individual students whose network strength may be low and, thus, may be at risk when it comes to performance on group assignments and projects. This activity would provide faculty members with valuable information that may be used to counsel a student on strategies for increasing the number and/or emotional closeness of a student's ties to classroom peers. More generally, measuring and managing classroom settings based on student social capital provides educators with tools to address students' deficiencies in so-called "soft skills" that have been demonstrated to impact their lives and future careers.

At the same time, our findings suggest that performance on group tasks may also suffer for students with overly high levels of social capital. Students with excessive network strength likely face the practical challenges—especially time and mental effort—of managing ties to too many peers, while also managing their academic responsibilities. This possibility again highlights the potential value of monitoring students' social capital and offering one-to-one counseling. A number of counseling options may be considered. One option is to help a student comprehend their high level of social capital and heighten their awareness of its impact on performance. Naturally, since the number of ties to peers is a contributor to social capital, instructors may be tempted to encourage some students to "prune" ties or limit interactions in their network. The pitfall, however, is that this approach may be too drastic. Instead, we encourage educators to seek to understand a student's specific situation and to offer more individualized guidance. Might the student be spreading herself/himself too thin with a focus on building or maintaining the largest possible network? Alternatively, might the student be seeking to develop too many emotionally close relationships with classroom peers? A personalized examination of a student's unique situation provides a starting point for educators to help students manage the number and strength of their relationships with peers.

Implications for Marketing Education Research

A novel contribution of this study to the marketing education literature lies in the finding that social capital plays a unique role in its impact on student performance. Gonzalez et al. (2004) first introduced the potential value of a social capital perspective in the classroom. Here, we extend their work by presenting and empirically testing a set of hypotheses that speaks to the performance-enhancing effects of a student's social capital. Specifically, our results suggest that social capital is most beneficial to students when participating in group tasks, and that this effect follows a curvilinear (inverted U-shaped) pattern such that initial efforts to develop social capital lead to performance gains, but that performance may decline at increasingly high levels of social capital. To date, direct tests of the value of a student's social capital have been rare in the education literature. Baldwin et al. (1997) were unable to support a posited linkage between social capital and student performance on

group tasks. By examining a curvilinear conceptualization of the effect of social capital on student performance, we offer the marketing education literature a fresh understanding of the role of social capital in the classroom. This finding extends the work of McFadyen and Cannella (2004)—who found a curvilinear relationship between performance and network strength—to a student setting. And although Ellison et al. (2011) find evidence of a point of diminishing returns on social capital development, we offer an important extension of their work by demonstrating the effect on student performance.

Given that prior research has frequently shown a positive link between social capital and performance on individual tasks, the absence of a relationship in this study between network strength and a student's grades on individual tasks was surprising. In hindsight, we speculate that the effect of social capital on performance may be contingent on the precise nature of an individual task. Specifically, individual tasks seem to vary in the degree to which a person may benefit from the help of others, such as the need for advice, input, collaboration, and coordination; as well as emotional or political support. For example, in Seevers et al. (2010), the nature of the individual task—purchasing of retail products—benefited from advice from industry peers, and the ability to leverage one's political influence. In the current study, however, performance on the primary individual task—exam grades—may simply reflect a test of intellectual ability. (Furthermore, the high average GPA [3.45 out of 4.00] within the student sample may have also contributed to the students' reduced dependence on others for the completion of individual tasks.) We encourage future research to consider the need for support from others (i.e., peers, classmates, instructors) as a variable that may moderate the impact of social capital on individual tasks.

Additionally, we encourage readers to consider how the design of this study may limit its generalizability. First, the specific design of the course under investigation may contribute to the need for and impact of a student's social capital. Future researchers may wish to consider the impact of course designs in which group tasks constitute different proportions of a student's overall grade. Future studies might also test the unique impact of social capital on various formats for individual tasks and group tasks. Second, future research may wish to design a study to distinguish between the impact of social capital on individual-level performance in a group setting—as we have done—and group-level performance, the latter of which may better reflect dynamics within the group. Third, in an optimal setting, researchers would be able to collect relationship data repeatedly over time and track participants over an extended timeframe. Our data, however, are cross-sectional and were collected based on approximately three months of interactions among students. This approach places a limitation on our findings since student tasks were completed and graded throughout the term. Furthermore, a cross-sectional approach does not fully account for the effects of students' relationships outside of the data collection window. Future researchers may wish to extend our research by following cohorts of students over longer periods of time and across multiple courses to examine the long-term impact of social capital on various aspects of academic performance.

Ultimately, the findings of our study point to several promising avenues of future research for marketing education scholars. First and foremost, the impact of social capital found in our study suggests the possibility that other types of networks may also impact student performance in academic circles. While we examined classroom networks as a starting point, scholars may wish to investigate how other types of social networks, such as friendship networks or professional networks, impact student performance. Additionally, scholars may wish to extend our research by examining how the social networks developed in academic contexts impact students' performance as they enter the business world. Doing so could help to further explain how academic relationships pave the way for future professional success.

REFERENCES

Aggarwal, P., Vaidyanathan, R., & Rochford, L. (2004). ACT/SAT scores and academic performance: Are marketing majors different? *Journal for Advancement of Marketing Education*, 4(Summer), 16-24.

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage Publications, Thousand Oaks, CA.

Bacile, T.J. (2013). The klout challenge: Preparing your students for social media marketing. *Marketing Education Review*, 23(Spring), 87-92.

Bacon, D.R., Stewart, K.A., & Stewart-Belle (1998). Exploring predictors of student team project performance. *Journal of Marketing Education*, 20(Spring), 63-71.

Baldwin, T. T., Bedell, M. D., & Johnson, J. L. (1997). The social fabric of a team-based M.B.A. program: Network effects on student satisfaction and performance. *Academy of Management Journal,* 40(6), 1369-1397.

Balkundi, P., & Harrison, D. A. (2006). Ties, leaders, and time in teams: Strong inference about network structure's effects on team viability and performance. *Academy of Management Journal,* 49(1), 49-68.

Bevelander, D., & Page, J.P. (2011). Ms. trust: gender, networks and trust—implications for management and education. *Academy of Management Learning & Education*, 2011(4), 623-642.

Boostrom, R.E., Jr., Kurthakoti, R., & Summey, J.H. (2009). Enhancing class communication through

segregated social networks. *Marketing Education Review*, 19(Spring), 37-41.

Borgatti, S.P., Everett, M.G., & Freeman, L.C. (2002). Ucinet for Windows: Software for Social Network Analysis, Harvard: Analytic Technologies.

Brass, D.J., Butterfield, K.D., & Skaggs, B.C. (1998). Relationships and unethical behavior: A social network perspective. *Academy of Management Review*, 23(January), 14-31.

Brown, J.J., & Reingen, P.H. (1987). Social ties and word-of-mouth referral behavior. *Journal of Consumer Research*, 14(December), 350-362.

Burt, R. S. (1992). *Structural holes: The social structure of competition*. Cambridge, MA: Harvard University Press.

Burt, R. S. (1997). The contingent value of social capital. *Administrative Science Quarterly,* 42(2), 339-365.

Burt, R. S. (1998). The gender of social capital. *Rationality and Society,* 10(1), 5-46.

Burt, R. S. (2004). Structural holes and good ideas. *American Journal of Sociology, 110*(2), 349-399.

Camey, J.P., Gray, G.T., & Wert-Gray, S. (2008). Evaluating the impact of student response systems on student performance. *Journal for Advancement of Marketing Education*, 13(Winter), 1-7.

Cohen, J., Cohen, P., West, S.G., & Aiken, L.S. (2003) *Applied Multiple Regression / Correlation Analysis for Behavioral Sciences.* Lawrence Erlbaum Associates, Mahwah, New Jersey.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology,* 94, S95- S120.

Corbin, S. (2002). Improving group collaboration and student teams' understanding of responsbility through a three-phased classroom assessment technique. Journal for Advancement of Marketing Education, 2(1), 37-49.

Dess, G. G., & Shaw, J.D. (2001). Voluntary turnover, social capital, and organizational performance. *Academy of Management Review,* 26(3), 446-456.

Dunbar, R.I.M. (1996). *Grooming, gossip, and the evolution of language*. Cambridge, MA: Harvard University Press.

Ellison, N. B., Steinfield, C., & Lampe, C. (2011). Connection strategies: Social capital implications of facebook-enabled communication practices. *New Media & Society,* 13(6), 873-892.

Foley, M.W., & Edwards, B. (1999). Is it time to disinvest in social capital? *Journal of Public Policy*, 19(2), 141-173.

Freeman, L. (1979). Centrality in social networks: Conceptual clarification. *Social Networks*, 1(February), 215-239.

Freeman, L., Romney, A.K., & Freeman, S.C. (1987). Cognitive structure and informant accuracy. *American Anthropologist*, 89(June), 310-325.

Frenzen, J., & Nakamoto, K. (1993). Structure, cooperation, and the flow of market information. *Journal of Consumer Research*, 20(December), 360-375.

Gamarnikow, E. (2011). *Social capital and human capital*. Thousand Oaks, CA: Sage.

Gneezy, U., Niederle, M., & Rustichini, A. (2003). Performance in competitive environments: Gender differences. *Quarterly Journal of Economics*, *118*(3), 1049-1074.

Gonzalez, G. R., Ingram, T. N., LaForge, R. W., & Leigh, T. W. (2004). Social capital: Building an effective learning environment inmarketing classes. *Marketing Education Review*, 14(2), 1-7.

Granovetter, M.S. (1973). The strength of weak ties. *American Journal of Sociology*, 78, 1360-1380.

Haab, T. C. & McConnell, K.E. (2003). *Valuing Environmental and Natural Resources: The Econometrics of Nonmarket Valuation*. Edward Elger, Cheltenham, UK.

Hannan, M. T., & Freeman, J. (1988). Density dependence in the growth of organizational populations. In G. Carroll (ed.) *Ecological Models of Organizations*. Ballinger Books, Cambridge, MA.

Hansen, M.T. (1999). The search-transfer problem: the role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 44(March), 82-111.

Hoffmann, J.P. (2004). *Generalized Linear Models*. Boston, MA: Pearson.

Hwang, A., Kessler, E. H., & Francesco, A. M. (2004). Student networking behavior, culture, and grade performance: An empirical study and pedagogical recommendations. *Academy of Management Learning & Education,* 3(2), 139-150.

Inkpen, A. C., & Tsang, E. W. K. (2005). Social capital, networks, and knowledge transfer. *Academy of Management Review,* 30(1), 146-165.

Israel, G. D., Beaulieu, L. J., & Hartless, G. (2001). The influence of family and community social capital on educational achievement. *Rural Sociology,* 66(1), 43-68.

Jaramillo, F., & Spector, P. (2004). The effect of action orientation on the academic performance of undergraduate marketing majors. *Journal of Marketing Education*, 26(3), 250-260.

Kennett-Hensel, P.A., Hensel, P.J., & Dellande, S. (2010). The marketing research portfolio: A pedagogical alternative for improving student performance. *Journal for Advancement of Marketing Education*, 16(Summer), 27-35.

Kilduff, M., & Krackhardt, D. (1994). Bringing the individual back in: A structural analysis of the internal market for reputation in organizations. *Academy of Management Journal*, 37(1), 87-108.

Krackhardt, D. & Kilduff, M. (1990). Whether close or far: Social distance effects on perceived balance in friendship networks. *Journal of Personality and Social Psychology*, 76pun(5), 770-782.

Laird, K., Prince, M., & Spence, M.T. (2003). Inter-group communication among cross-disciplinary student teams: An exploratory study of processes and effects. *Journal for Advancement of Marketing Education*, 3(1), 26-39.

Lakon, C., Hipp, J.R., & Timberlake, D.S. (2010). The social context of adolescent smoking: a systems perspective. *American Journal of Public Health*, 100(7), 1218-1228.

Lin, N. (1999). Social networks and status attainment. *Annual Review of Sociology, 25*, 467-488.

Lin, N. (2001). *Social capital: A theory of social structure and action.* New York: Cambridge University Press.

Lin, N., & Dumin, M. (1986). Access to occupations through social ties. *Social Networks*, 8, 365-385.

Marsden, P.V., & Campbell, K.E. (1984). Measuring tie strength. *Social Forces*, 63(December), 482-501.

McFadyen, M. A., & Cannella Jr, A. A. (2004). Social capital and knowledge creation: Diminishing returns of the number and strength of exchange. *Academy of Management Journal,* 47(5), 735-746.

Mehra, A., Kilduff, M., & Brass, D. J. (2001). The social networks of high and low self-monitors: Implications for workplace performance. *Administrative Science Quarterly,* 46(1), 121-146.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(April), 242-266.

Nelson, R.E. (1989). The strength of strong ties: social networks and intergroup conflict in organizations. *Academy of Management Journal*, 32(June), 377-401.

Nowell, A., & Hedges, L. V. (1998). Trends in gender differences in academic achievement from 1960 to 1994: An analysis of differences in mean, variance, and extreme scores. *Sex Roles*, 39(1-2), 21-43.

Pil, F. K., & Leana, C. (2009). Applying organizational research to public school reform: The effects of teacher human and social capital on student performance. *Academy of Management Journal,* 52(6), 1101-1124.

Poropat, A.E. (2009). A meta-analysis of the five-factor model of personality and academic performance. *Psychological Bulletin*, 135(2), 322-38.

Rindfleisch, A., & Moorman, C. (2001). The acquisition and utilization of information in new product alliances: A strength-of-ties perspective. *Journal of Marketing*, 65(April): 1-18.

Russell, M., Fischer, M.J., Fischer, C.M., & Premo, K. (2003). Exam question sequencing effects of marketing and management science student performance. *Journal for Advancement of Marketing Education*, 3(1), 1-10.

Seevers, M.T., Skinner, S.J., & Dahlstrom, R. (2010). Performance implications of a retail purchasing network: The role of social capital. *Journal of Retailing*, 86(December), 356-367.

Seibert, S.E., Kraimer, M.L., & Liden, R.C. (2001). A social capital theory of career success. *Academy of Management Journal*, 44(2), 219-237.

Seidel, M.L., Polzer, J.T., & Stewart, K.J. (2000). Friends in high places: The effects of social networks on discrimination in salary negotiations. *Administrative Science Quarterly*, 45(March): 1–24.

Shaw, J. D., Duffy, M. K., Johnson, J. L., & Lockhart, D. E. (2005). Turnover, social capital losses, and performance. *Academy of Management Journal,* 48(4), 594-606.

Tom, G., & Calvert, S. (1984). Learning style as a predictor of student performance and instructor evaluations. *Journal of Marketing Education*, 6(2), 14-17.

Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal,* 41(4), 464-476.

Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42(March), 35-67.

Vander Schee, B.A. (2009). Test item order, academic achievement and student performance on principles of marketing examinations. *Journal for Advancement of Marketing Education*, 14(Summer), 23-29.

Wasserman, S., & Faust, K. (1994). *Social Network Analysis: Methods and Applications*. New York: Cambridge University Press.

Appendix
Individual and Group Task Descriptions

Individual Tasks

Written Exams
Multiple written exams were administered at regular intervals during the course. Each exam was independent, i.e., no exam was comprehensive. The exams were designed to be representative of the material from assigned readings and instructor lectures. The exam format included multiple choice, true/false, and short answer questions. Written exams accounted for 55% of a student's overall grade for the course.

Class Participation
The instructor assigned participation grades according to a student's level of involvement in and contributions to class discussion throughout the course. In general, participation was graded to reward quality over quantity. Students were informed that high quality contributions were those that provided unique insight, relevant personal experience, or outside material. Class participation accounted for 10% of a student's overall grade for the course.

Group Tasks

Case Analysis Report
Throughout the course, multiple case studies were assigned for class discussion. The instructor assigned student groups to complete and submit a written analysis of one case study. Typical group size was five students. Average length of report was 10 pages. The case analysis report accounted for 15% of a student's overall grade for the course.

Research Report & Presentation
Students worked in groups to complete a report that required significant research to develop a deeper understanding of a topic related to course material. Typical group size was five students. The average length of the reports was 10-12 pages, plus reference materials. The task concluded with each team presenting its findings to classmates. The research report and presentation accounted for 20% of a student's overall grade for the course.