Incoming Leadership-Oriented Differences between Students in a Leadership Studies Course and a Team-based Project Course

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Abstract

This study examined the incoming leadership-oriented differences between students (*N*=166) enrolled in either an elective leadership studies course (n=50) or an elective team-based engineering projects course (n=116) to determine significant predictors of transformational leadership behavior. Participants completed measures of leadership-oriented behaviors, self-efficacy, and motivation. Students enrolled in the leadership studies course scored higher on measures of both transformational and transactional leadership behaviors, as well as motivation to lead based on affective identity and social-normative motivation. For students in the leadership course, the only significant predictor of transformational leadership was leadership-self-efficacy score. For students interested in team-based projects, the significant predictors included affective-identity and social-normative motivation to lead, as well as leadership self-efficacy. While women displayed higher motivation to lead across all motivation categories, neither race nor gender emerged as a significant predictor of leadership behaviors. These findings suggest the importance of self-efficacy in predicting behavior and the need to attend to students' internal and external motivations in creating pathways to leadership practices.

Introduction

Formal leadership education programs represent a growing academic field (Dugan & Komives, 2007) reflecting the shift in mission and objectives of higher education to train responsible, team-based leaders (Spralls, Garver, Divine, & Trotz, 2010). In fact, a recent study (Riggio, Ciulla, & Sorensen, 2003) determined that more than 1,000 higher education institutions offer leadership education programs of some sort, while many of these take the form of for-credit academic courses (Sessa, Matos, & Hopkins, 2009). Although the evaluation of success of these programs is often justifiably focused on pedagogical methods (Eich, 2008; Moore, 2010; Spires & Hervey, 2011) or on the leadership paradigms utilized (Owen, 2012; Posner, 2009), very little focus has been afforded to the incoming attributes of students who enroll within these courses. Given that many programs continue to be elective in nature (Owen, 2012), a better understanding of students who elect to participate in the broad portfolio of leadership development courses is necessary to more fully understand the effects of particular aspects of leadership education on student development of their leadership skills. Presumably, the more educators can understand about the types of students who elect to participate within their courses, the better they will be able to help them learn. Understanding the pathways to effective leadership for all students is necessary for educators to expand their influence to broader populations of students than those currently being reached.

Past research indicates that students may be in different stages of identifying and engaging in the leadership process. Although some students may be aware of surrounding leadership practices they may not be confident enough to explore and engage in the process (Komives, Longerbeam, Owen, Mainella, & Osteen, 2006). Shertzer and Schuh (2004) found that students who occupy formal positions of influence within student groups possess higher self-esteem and consider themselves leaders among their peers to a greater extent than students without such formal positions. Others reveal that student positional leaders are more committed to tasks (Ricketts, Bruce, & Ewing, 2008) and the individualized responsibilities of the leader (Stedman, Rutherford, & Roberts, 2006). However, this line of research has not yet been extended to include a more nuanced study that examines the practice of leadership beyond assigned positions. Our research focused on two different types of students – those who elect to take academic courses in leadership education and those more interested in developing skills for team success, where leadership is not a specific focus within the curriculum. Such an examination on these two groups of students is aligned with an emerging emphasis in leadership education in understanding the differences between leader development and leadership development programs (Day, 2001). Do students who can choose between courses focused on these two concepts differ in their capacity, self-efficacy, and motivation to lead? Moreover, do they differ in the factors that predict their capacity as a leader?

Leader Versus Leadership Development

An emerging consideration in the study of leadership education programs often pertains to the difference between leader development and leadership development (Day, 2001). Using Day's language, leader development refers to the idea of inculcating knowledge and skills *in particular individuals* so they can make effective decisions and perform correct actions (Murphy & Johnson, 2011). Leadership development, by contrast, is more focused on skill-building and relationships at a *team or organizational level* and recognizes that leadership is something that occurs in the process of individuals working within those groups for common goals (Komives, 2011). Said another way, some aspects of leadership education programs focus on individual skills – leader development – such as self-awareness and self-management (Murphy & Johnson, 2011), while other aspects focus on team skills – leadership development – such as developing a common purpose or managing group conflict, that directly benefit an entire team and its process of achieving group goals. Recent calls have been made to consciously attend to these differences in building more integrative theories for how leaders grow in their skills and benefit the teams to which they are a part (Avolio, 2007). Because modern organizations are both flatter (Friedman, 2007) and more transparent than in the past (Seidman, 2007), leaders and the educational programs that train them must focus on training at both levels to attain maximum success (Posner, 2009; Ricketts et al., 2008).

Our focus on both aspects of leadership capacity-building is necessary given the current emphasis within college campuses (Owen, 2012) on transformational leadership (Bass, 1998) as the conceptual framework utilized within their programs. Described as post-industrial (Rost, 1993) in its emphasis on personal influence, complexity, and creating authentic relationships to obtain desired outcomes (Northouse, 2010), models of transformational leadership have become one of the most popularly studied and taught models of leadership in the world (Gardner, Lowe, Moss, Mahoney, & Cogliser, 2010). Transformational leaders encourage the creation of environments where followers buy in to a shared goal or mission and perform tasks that enhance the team environment while minimizing focus on personal gain (Groves & LaRocca, 2011). Transformational leaders invest time in building accepting environments that allow individuals to trust each other and push members to perform beyond minimal standards (Antonakis, Avolio, & Sivasubramaniam, 2003). Recent research indicates transformational environments increase levels of team performance and motivate team members to excel beyond expectations (Wang, Oh, Courtrigh, & Colbert, 2011). Such focus on team dynamics and success requires educational programs that train emerging leaders to attend to aspects of leadership development at least as often as leader development.

Transformational leadership theorists also describe a contrasting style of personal influence labeled transactional leadership. A transactional leader encourages the use of rewards, incentives, and positive reinforcement for compliance of the followers. These leaders will work towards the

interests of the group if doing so serves their self-interests (Bass, Avolio, Jung, & Berson, 2003). Followers of the transactional model agree to the leader's terms to complete tasks for promised benefits (Jung & Avolio, 2000). Transactional leader behavior is not necessarily detrimental to group performance or effectiveness when individual or group goals are aligned. However, because of its lack of emphasis in ethical practices and authentic relationship-building, it is not considered as essential for success by current leadership educators as are transformational leadership behaviors (Faris & Outcalt, 2001).

Individual Factors Associated with Leadership Capacity

While several individual capacities and traits have been connected to transformational and transactional leadership, including emotional intelligence (Côté, Lopes, Salovey, & Miners, 2010; Harms & Crede, 2010), ethical practices (Bass & Steidlmeier, 1999), and servant leader styles (Barbuto & Wheeler, 2006), surprisingly little research has been conducted connecting leaders' transformational and transactional styles to their self-efficacy in leading and specific degree of motivation to engage in leadership behaviors. Leadership self-efficacy, defined as students' perception of their capacity to lead others or engage with others in the leadership process (Murphy, 2002) has been shown to predict increased interest in leadership positions, and higher ratings of performance of leaders by group members (Hannah, Avolio, Luthans, & Harms, 2008). The measurement of leadership motivation was first systemically described by Chan and Drasgow (2001), who posited three separate types of motivation that leaders typically possess: Affective-Identity, where leaders are motivated to lead based on their self-concept as a leader of their peers; Non-Calculative, where leaders are motivated to lead based on an avoidance of a logical cost-benefit analysis of benefit to them personally; and, Social-Normative, where motivation to lead stems from a feeling of responsibility to the group and messages from others that their leadership is required for group success. Similar to leadership self-efficacy, motivation to lead has been under-examined in leadership education in the higher education environment.

Past research (Dugan & Komives, 2007) has shown that male students report higher levels of leadership self-efficacy than their female peers, potentially owing to gender differences in how leader actions would be interpreted by group members (Kezar & Moriarty, 2000). However, women have reported more engagement in transformational leadership behaviors (Eagly & Carli, 2007) and score higher on measures of leadership using a transformational frame (Dugan & Komives, 2007; 2010). These findings suggest that while women behave more often as transformational leaders, men seem more confident when leading. Differences have also been found when examining the effect of race in leader behaviors (Arminio et al., 2000), where students of color feel they lead differently than Caucasian students. Clearly, gender and racial demographics may play a significant role in leader self-efficacy, motivation to lead, and leadership behaviors. However, research currently examining the structure of these differences is "scant" (Dugan, Komives, & Segar, 2008, pp. 478-479).

Presumably, the degree of skill and time required to create authentic, trusting relationships would be affected by the degree to which prospective leaders feel they can be successful in the activity and motivated to engage in it. This is supported by emerging research (Dugan, 2011; Lester, Hannah, Harms, Vogelgesang, & Avolio, 2011) that indicate more attention should be paid to leader self-efficacy and its effects on leader behaviors. Moreover, the differing types of motivation leaders possess may lend them to act more or less often in a transformational manner.

Framework for the Study

The research we conducted focused on incoming individual differences between students who elected to register for a leadership theory course focused mainly on leader development – developing skills for individual success – and students who registered for an elective teams-based project management course focused on leadership development – team-building and group success. See Table 1 for a summary of learning goals for each course. Our research seeks to inform leadership educators about the incoming differences in transformational and transactional behavioral styles, as well as leadership self-efficacy and motivation to lead, between students who elected to register for a leadership studies course and those who registered for a teams-based project management course which did not include anything explicitly about leadership within its syllabus or curriculum. Moreover, we sought to determine how leadership self-efficacy and motivation to lead, in addition to students' race and gender, might differently predict transformational leadership styles across the two samples.

Table 1

Learning Goals For Leadership and Teams Courses

Course	Focus	Learning Goals
Leadership Studies Course	Leader Development	1) An explicit study of leadership practice and models 2) Personal value clarification and goal-setting 3) Self-awareness and reflective practitioner skills
Teams-based Project Management Course	Leadership Development	1) Project planning and management skills, especially regarding unstructured problems 2) Application of knowledge to solve real-world problem chosen by team 3) Team final demonstration

Research Questions

Given our interest in understanding diverse pathways to effective leadership practices, we posed the following research questions:

- Do students who elect to register for a leadership theory course differ from students who elect to register for a team-based project course in their:
    - Leadership self-efficacy?
    - Motivation to lead?
    - Transformational leadership capacity?
    - Transactional leadership capacity?
- Do differences exist between the two groups of students in the factors that predict transformational leadership behaviors?

Methods

Population and Sample

The study was conducted at a large, public, research-extensive university in the Midwestern United States. The researchers focused on two courses within the college of engineering. The first course, an Introduction to Leadership Studies class, was designed to focus on the study of leadership and leader capacity-building in an engineering context. The second course, a Teams-based Projects Management class, was designed with a practical focus to teach teamwork skills in project planning and management to students entering a four-year curriculum emphasizing such skills in an engineering context. While the course included training in strategic planning, goal setting, and intergroup communication, an explicit study of leadership was absent from course descriptions available to students during course registration periods and within the course syllabus registered students received at the beginning of the semester.

Both courses were elective in nature and open only to first-year students matriculated within the college of engineering. Most students registered for the courses during a day-long orientation program the summer prior to the courses being offered. The two courses were part of a larger menu of elective courses offered to first-year students in their fall semester, all designed to provide non-technical skill development and advertised as such during the orientation program. Two students were enrolled in both courses, and were not included in the study. Of the 54 students in the Leadership Studies course, 50 (93%) participated in the research, while 116 of 125 (93%) participated from the Team-based Project Management course. Approximately 80% (n=133) identified as male, while within the Leadership course 70% (n=34) and within the Teams course 88% (n=97) so identified. Both differences represent small but statistically significant effects regarding gender spread expected and measured. Across both courses 56 % (n=93) identified as Caucasian-American; 18% (n=30) as Asian-American; 15% (n=25) as international students; 4% (n=6) as African-American; 4% (n=7) as Latino/a; and, 3% did not identify their race. Both courses were filled to over 80% of capacity; the disparity in size was based on available classroom space.

Data Collection

As the study was designed to measure the pre-existing leadership capacities of students interested in the two separate courses, data were collected within the first week of the course to ensure that course material would not unduly influence responses. Students completed a paper-based survey within the classroom environment, where researchers shared that participation was optional and course instructors would not know who participated and who did not. Collected data was then entered into a spreadsheet for analysis.

Variables and Instrumentation

We utilized a 60-item survey that included established scales of transformational and transactional leadership behaviors, leadership self-efficacy and motivation to lead, as well as two items asking students to identify their race and their gender. To measure transformational and transactional leadership, we used two scales totaling 27 items taken from the Transformational Leader Index (TLI) (Podsakoff, MacKenzie, Moorman, & Fetter, 1990), an instrument designed to measure leader behaviors that align to transformational or transactional values. Within the TLI, an item measuring transformational behaviors was, "I help other group members develop a team attitude and spirit among ourselves." An item measuring transactional leadership was, "I always give positive feedback when other group members perform well." Item responses include a 5-point Likert scale ranging from "Strongly agree" to "Strongly disagree." The TLI represents one of the most widely-used measures of transformational and transactional leadership (Yukl, 2010), owing, in part, to its inclusion of a broader range of leadership behaviors than is found on another popular measure of transformational leadership, the Multi-factor Leadership Questionnaire (Yukl, 1999). The TLI was utilized within this study not only for its prominence, but because of its language focus of organizational citizenship (Podsakoff, MacKenzie, Paine, & Bachrach, 2000) rather than a more explicit focus on leadership vocabulary, which otherwise might have caused students within the Leadership course to respond differently than students within the Teams course. Cronbach's alpha within this study for the transformational leadership scale was strong (.87), while the alpha score within the transactional leadership scale was acceptable, but marginally low at .63.

The survey also included a 4-item scale of Leadership Self-Efficacy (LSE) which is utilized within the Multi-Institutional Study of Leadership (MSL) and has been used in studies of college student leadership in the past (Dugan & Komives, 2010). An item within the scale is, "How confident are you in being successful at leading others?" Item responses include a 4-point Likert-scale ranging from "Not at all confident" to "Very-confident." Internal validity within the national MSL sample of students was high, at .87 (Dugan & Komives, 2010). Cronbach's alpha within this study was also strong, measured at .80.

A student's motivation to lead was measured using the Motivation To Lead (MTL) scale (Chan & Drasgow, 2001), which included 27 items divided equally across three subscales, Affective-Identity (AI) Motivation, Social-Normative (SN) Motivation, and Non-calculative (NC) Motivation. The AI scale measures the degree to which a person is attracted to being within a leadership role when involved with others, and includes items such as, "Most of the time, I prefer being a leader rather than a follower when working in a group." The SN scale determines the degree to which a person leads from a sense of responsibility or duty to others, and includes items such as, "People should volunteer to lead rather than wait for others to ask or vote for them." The NC scale measures the degree that a person avoids rationally calculating the individual costs and benefits accrued from occupying a position of leadership within a group, and includes items such as, "I never expect to get more privileges if I agree to lead a group." Possible responses fall within a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." Internal reliability from previous research for the scale has been acceptable, ranging from .65 to .91, while the three-factor model itself has been found robust through confirmatory factor analysis (Chan & Drasgow, 2001). Within this study, Cronbach's alpha for each sub-scale fell within acceptable ranges, varying from .73 to .89. A summary list of independent variables within the study can be found in Table 2.

Table 2

Significant Variables Included in Research

Independent Variables (IV)	Dependent Variables (DV)
Student Gender	Transformational Leadership (TF)
Student Race	Transactional Leadership (TA)
Leadership Self Efficacy (LSE)	
Affective-Identity Motivation to Lead (AI)	
Social-Normative Motivation to Lead (SN)	
Non-Calculative Motivation to Lead (NC)	

Data Analysis

Sample-wide means and standard deviations were calculated with regard to each scaled IV (LSE and each of the three MTL subscales) and DV (TF and TA). Because race and gender have been shown in the past to mediate scores on quantitative instruments of leadership development (Dugan & Komives, 2007; Kezar & Moriarty, 2000), we performed *t*-tests using each scale as a

dependent variable with regard to race and gender. An independent samples *t*-test was also conducted for each scale variable to ascertain differences between students enrolled in the two courses. To analyze which IVs might predict transformational leadership behaviors within each course, we conducted a hierarchical multiple regression analysis for each, where we entered race and gender in Step 1, and LSE and the three MTL subscale scores in Step 2, using TF scores as the DV.

Results

We based our study on investigating two primary research questions. First, do students who elect to register for a leadership theory course differ from students who elect to register for a team-based project in: (a) leadership self-efficacy, (b) motivation to lead, (c) transformational leadership capacity, and (d) transactional leadership capacity. Second, do differences exist between the two groups of students in factors that predict transformational leadership behaviors?

Differences in Capacity, Efficacy, and Motivation

Basic descriptive statistics for survey responses are provided in Table 3. Means and standard deviations are listed for all students within the overall sample, as well as for the two sub-samples – students enrolled in the Leadership class and those enrolled in the Teams class. It should be noted that while Leadership Self-Efficacy (LSE) scores seemed lower for both groups relative to the other scales, LSE scores ranged only from 1 to 4, not 1 to 5 as other scales within the survey.

Table 3

Means and Standard Deviations for Overall Two-class Sample, Leadership course, and Teams Course

	Overall		Leadership Course		Teams course		Women		Men	
Variable	μ	*SD*	μ	*SD*	μ	*SD*	μ	*SD*	μ	*SD*
LSE^	3.17	0.64	3.30	0.65	3.11	0.65	3.30	0.59	3.15	0.66
AI*#	3.55	0.72	3.72	0.77	3.47	0.69	3.87	0.69	3.49	0.72
SN*#	3.63	0.49	3.77	0.45	3.57	0.49	3.81	0.42	3.60	0.49
NC#	3.62	0.56	3.65	0.66	3.61	0.52	3.87	0.54	3.59	0.55
TF*	3.84	0.42	3.96	0.39	3.80	0.42	3.95	0.39	3.84	0.42

TL*	4.01	0.45	4.13	0.45	3.96	0.44	4.05	0.52	4.01	0.42

^ Using a 4-point Likert-scale
* Significant differences ($p<.05$) between Leadership Course and Teams Course students
# Significant differences ($p<.05$) between Women and Men

Because the Leadership course sample and Teams course sample were differently sized (n=50 and n=115, respectively), Levene's test for equality of variances (Hinkle, Wiersma, & Jurs, 2002) was conducted with respect to each variable as a check for whether t-tests could be conducted. No statistical differences were found within any scale ($p < .05$), meaning variance differences across groups was not significant. To determine if score differences between the two courses with respect to each IV and DV scale were significant, we conducted an independent samples t-test for each variable. Significant differences were found in transformational leadership behaviors ($t(164)=2.24$; p=.03); transactional leadership behaviors ($t(164)=2.31$; p=.02); AI motivation to lead ($t(164)=2.12$; p=.03); and, SN motivation to lead ($t(164)=2.50$; p=.01). The effect sizes (measured by Cohen's d) for these differences were moderate, ranging from .34 to .43. No significant differences were found in LSE scores ($t(164)=1.64$; p=.10) or NC motivation to lead ($t(164)=0.52$; p=.60).

To determine if significant differences existed between males and females, we performed t-tests for each leadership scale. Significant differences emerged with respect to all categories within the motivation to lead scale: AI, $t(158)=-2.54$, p=.01; SN, $t(158)=-2.04$, p=.04; and NC, $t(158)=-2.45$, p=.02. Effect sizes (measured by Cohen's d) ranged from .46 to .54, meaning that females displayed moderately higher motivation to lead within all three scales than males. No significant differences were found in either transformational or transactional leadership behaviors, or in LSE. To conduct an analysis of differences in scale scores by race, we performed a series of ANOVA tests using each scale as a DV. No significant differences in scores on any scale emerged using racial grouping as a criterion variable, thus follow-up t-tests were not conducted.

Differences in Predictors of Transformational Leadership Capacity

To determine if different significant predictors of transformational leadership skills existed between the two samples of students, we conducted two separate two-step hierarchical multiple regressions – one for each course sample. We entered race and gender in the first step, and then the four scale scores (LSE, AI, SN, and NC) in the second step. The results of this analysis can be found in Table 4 for Leadership course students and Table 5 for Teams course students. For students in the Leadership course, the only significant predictor in either step of the analysis was LSE score, while the overall model predicted 18% of the variance in transformational leadership behavior scores. For students within the Teams class, LSE score also emerged as a predictor, and AI and SN motivation to lead did as well. The overall model for the Teams course predicted 31% of the variance in transformational leadership behavior scores.

Table 4

Predictors of Transformational Leadership within Leadership Course Students

	B	*SE B*	*B*	P
Step 1				
Race	.07	.06	.15	.29
Gender	.06	.12	.08	.58
Step 2				
Race	.02	.05	.06	.60
Gender	-.01	.09	-.01	.97
LSE*	.26	.10	.43	.01
AI	.09	.08	.18	.28
SN	.18	.11	.20	.11
NC	.05	.07	.09	.46

* Significant at $p<.05$

Table 5

Predictors of Transactional Leadership Behaviors within Teams Course Students

	B	*SE B*	*βB*	*P*
Step 1				
Race	.03	.04	.13	.50
Gender	-.03	.08	-.04	.67
Step 2				
Race	.05	.03	.13	.09
Gender	-.04	.06	-.05	.47
LSE***	.20	.06	.30	.001

AI***	.17	.06	.28	.004
SN***	.25	.07	.28	.001
NC	.04	.06	.05	.52

*** Significant at $p<.01$

Discussion and Implications

Our research questions led us to investigate overall leadership-oriented differences between engineering students enrolled in a leadership studies course and students enrolled in a teams-based project management course, and then to examine the factors that predict transformational leadership behaviors between the two groups. In regards to overall differences, students in the leadership studies course possessed a higher degree of affective-identity and social-normative motivation to lead, in addition to reporting higher degrees of both transactional and transformative leadership behaviors. Unsurprisingly, our data imply that students enrolled a course involved in the explicit study of leadership may be more motivated to lead based on both an internal identity of themselves as leaders and because they feel more of a sense of responsibility to lead their peers than students more interested in working in a group on goals-based projects. In addition, students explicitly studying leadership reported higher levels of reported transformational and transactional leadership behaviors. Somewhat counter-intuitively, however, no difference in leadership self-efficacy emerged between the two groups. This finding is noteworthy, in that students who explicitly study leadership seemed similar in their confidence in practicing leadership to students who do not.

Surprisingly, female students self-reported higher motivation to lead across all categories of motivation compared to their male peers and equal degrees of leadership self-efficacy, which indirectly contradicts past research showing women report lower levels of leadership self-efficacy (Dugan & Komives, 2007) and do not as often envision themselves in leadership positions (Killeen, Lopez-Zafra, & Eagly, 2006). No significant predictors of leadership behavior emerged in regards to race, which conflicts with previous research suggesting the effect of race on leadership self-efficacy (Dugan, Garland, Jacoby, & Gasiorski, 2008), motivations (Arminio et al., 2000), and behavior (Dugan & S. Komives, 2007). These contradictory findings related to social identity, however, may be a result of the specialized population chosen for the study. Both courses were housed within the college of engineering, where men typically outnumber women; within the two courses in particular, the ration was four to one. While our results regarding gender are interesting and deserving of further study, they may not generalize to a larger population without replication and population expansion.

Regarding our second research question, the factors that predicted transformational leadership behaviors differed across the two groups. The only variable that served as a significant predictor

for students in the leadership course was students' leadership self-efficacy. While leadership self-efficacy also predicted transformational behaviors in the teams-based course, affective-identity and social-normative motivation to lead did as well, reflecting the potentially more complicated pathway to leadership development for students who may not be explicitly interested in studying leadership but are engaged in teamwork and collaboration. These findings are noteworthy, in that examining only four variables (gender, race, motivation to lead, and leadership self-efficacy) explained 18% and 31% of the variation in transformational leadership score, respectively, within the leadership studies course students and teams-based projects course students.

Implications

Several implications arise from the findings within this study related to the pathways to effective leadership for different groups of students. These results suggest that for students interested in studying leadership through academic coursework, while they outdistance their peers in motivation to lead and leadership capacity, leadership self-efficacy (i.e., confidence in leading) is a powerful gateway to effective leadership practices. For students who might not explicitly study leadership but engage in leadership development through work on a team to accomplish a project, their pathway to effective leadership may be more complex, involving a combination of motivation and efficacy.

Within courses where leadership development is an explicit focus, these courses should include several opportunities to deeply engage in the practice of leadership and receive clear feedback to aid in their sense of efficacy. In addition to the review of formal theory and case study within formalized classrooms, including a leadership laboratory section, where students can make individualized practical sense of the theory they learn in the classroom, may aid students in practicing skills necessary for their success. For students more interested in studying and practicing teamwork without explicit regard for leadership, educators may need to focus on helping students understand their responsibility to the group (i.e., social-normative leadership motivation) and how they can each be successful influencing its process (i.e., affective-identity motivation) without regard for individual costs and benefits (non-calculative motivation). Within program and courses focused on teamwork, students may benefit from a deep analysis of the processes that lead to success, with particular focus on their own individual contributions and how their actions led to success or failure. This may be particularly noteworthy in teambuilding activities that take place with structured experiences such as ropes courses and weekend teambuilding retreats that take place at the beginning of a group's process.

Limitations and Suggestions for Further Research

Our results suggest further study in the overlapping constructs of leadership self-efficacy, motivations to lead, and the transformational behaviors of leadership. This exploratory research

suggested that the pathways to transformational leadership may be different for students who enroll in courses explicitly focused in studying leadership than the pathways for students interested in serving on teams but not necessarily in a leadership role. Further study into these differences is warranted, specifically in areas that may help determine if these findings are generalizable, such as with populations of students that include more than engineering majors. However, a limitation of our research was that it was conducted with engineering-specific students in their first semester in college. Would differences emerge after students have become more embedded in campus life and involved in both formal and informal leadership development opportunities? Would the gender differences that emerged in this study be replicated in more experienced students, or in populations that are more gender-diverse?

Our research was limited by utilizing a single wave of data collection examining incoming differences in students. Utilizing a pre-/post-test design with similar instrumentation to examine the effects that different types of leadership courses have on student leadership development is also warranted. Moreover, a focus on outgoing differences may extend our knowledge of how students progress through formal leadership programs.

The sample utilized in this study was too small for adequate statistical power to be exercised in a structural equation model or multi-level model methods of analysis. Further research with larger samples that utilize these methods would help better determine the role that motivation to lead and leadership self-efficacy has on transformational behaviors, as well as how these constructs are affected within particular environments.

Conclusion

Given the growing interest in leadership education and the study of its effectiveness (Spralls et al., 2010) this research described the incoming leadership-oriented differences between students interested in the explicit study of leadership and students interested in teams-based projects where leadership was practiced but not an explicit focus. The findings served to highlight the important role that efficacy and motivation play in the practice of leadership, and how more research is necessary to better understand the complex interplay between efficacy, motivation, and behavior in a leadership context. In addition, the results suggested the need to better understand the diverse pathways to effective leadership taken by students.

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