Changes in Leadership Attitudes and Beliefs Associated with the College Experience:
A Longitudinal Study

Donald V. Fischer, MSPT
Associate Professor of Exercise Science & Sport Studies
College of Saint Benedict/Saint John's University
dfischer@csbsju.edu

Richard M. Wielkiewicz, Ph.D.
Professor of Psychology
College of Saint Benedict/Saint John's University
rwielk@csbsju.edu

Stephen P. Stelzner, Ph.D.
Professor of Psychology
College of Saint Benedict/Saint John's University
sstelzner@csbsju.edu.

Maribeth Overland, M.S., Director
Student Activities and Leadership Development
College of Saint Benedict/Saint John's University
moverland@csbsju.edu

Alyssa S. Meuwissen
Department of Psychology
College of Saint Benedict / Saint John's University

Abstract

Incoming first-year college students completed a leadership survey prior to any formal leadership education. These students were reassessed during the spring of their senior year; 386 students completed both surveys. The differential effect of 33 leadership and demographic variables on change in hierarchical and systemic leadership beliefs were examined with stepwise regression analyses. Completion of a leadership certificate intended for students in supervisory student employment positions and racial/ethnic background were the only variables predicting changes in leadership beliefs. Results are discussed relative to Leadership Identity Development theory (Komives, Owen, Longerbeam, Mainella, & Osteen, 2005) and ecological leadership theory (Wielkiewicz & Stelzner, 2005).

Introduction

Fueled by the understanding that leadership can be learned (Avolio & Hanna, 2008; Dugan & Komives, 2010; Zimmerman-Oster & Burkhardt, 1999), institutions of higher learning have been called upon to provide effective curricular and co-curricular leadership development

programs (Astin & Astin, 2000). However, the leadership development of college students does not occur exclusively within formal leadership development programs. Leadership development has also been associated with a variety of college experiences, including participation in campus clubs and organizations (Dugan & Komives, 2007; Kezar & Moriarty, 2000; Thompson, 2006), volunteering and community service (Astin & Sax, 1998; Cress, Austin, Zimmerman-Oster, & Burkhardt, 2001; Dugan, 2006; Dugan & Komives, 2007, 2010; Thompson, 2006), holding leadership positions (Dugan & Komives, 2007; Dupuis, Bloom, & Loughead, 2006; Hall, Forrester, & Borsz, 2008), participation in intercollegiate or intramural athletics (Thompson, 2006), engagement in socio-cultural conversations (Dugan & Komives, 2007, 2010), and mentoring relationships with peers and/or faculty (Dugan & Komives, 2007, 2010; Thompson, 2006). Additionally, demographic variables such as gender (Dugan & Komives, 2010; Eagly, Johannesen-Schmidt, & van Engen, 2003; Fischer, Overland, & Adams, 2010; Wielkiewicz, 2000, 2002; Wielkiewicz, Fischer, Stelzner, Overland, & Sinner, 2012) and ethnicity (Dugan & Komives, 2007, 2010; Grahn, Swenson, & O'Leary, 2001) have been purported to influence leadership development. Therefore, it appears colleges and universities have a number of factors to consider in planning where and how to effectively implement leadership development programming in order to enhance the leadership capacities of their students.

To aid colleges and universities in developing effective leadership development programs, there has been a call for research to examine the effectiveness of formal leadership programs (Ayman, Adams, Fisher, & Hartman, 2003), particularly the differential impact of leadership programs relative to other college experiences (Dugan, Bohle et al., 2011; Fischer et al., 2010). The current longitudinal study sought to investigate changes in the way students think about leadership as an indicator of leadership development during college, and to examine the relative contribution of participation in a leadership certificate program, common college experiences, and demographic factors in facilitating changes in leadership thinking. Because of the wide variety of college experiences that have been associated with leadership development, and the dearth of research examining the differential impact of these activities in facilitating leadership development, an exploratory approach was utilized with this study.

Defining Leadership and Leadership Development

For this study, leadership is defined as an emergent process characterized by the tension between systemic (relational) and hierarchical (positional leader) processes (Wielkiewicz & Stelzner, 2005). The leader's role is to optimize or balance the tension between the traditional hierarchical approach and the systemic approach. Neither approach can be pursued exclusively. Instead, leaders must strive to balance these processes according to the circumstances in order to effectively respond to adaptive challenges and ensure the long-term sustainability of the organization (Wielkiewicz & Stelzner, 2005).

Leadership development is a long-term process that involves the assimilation of life experiences into one's understanding of leadership and the promotion of one's overall leadership capacity (Komives, Owen, Longerbeam, Mainella, & Osteen, 2005; McCauley, Moxley, & Van Velsor, 1998). However, life experiences alone are not sufficient to promote leadership development. Life experiences must be analyzed and interpreted relative to previous experience and the individual's conception of effective leadership (Mumford & Manley, 2003).

Furthermore, the process of leadership development is not slow and steady; rather, it is marked by periods of rapid development catalyzed by "trigger events" that challenge the individual to reconsider and broaden his or her leadership beliefs and leadership self-construct (Avolio & Hanna, 2008, p. 341). The product of leadership development is an enhanced leadership capacity, which enables the individual to better adapt to new or more complex situations and to better respond to a wider variety of unforeseen leadership challenges (Day, 2001).

Komives, Longerbeam, Owen, Mainella, and Osteen (2006) have proposed a six-stage Leadership Identity Development (LID) model characterized by a linear, yet cyclical, progression through six stages of leadership development: *awareness*, *exploration and engagement*, *leader identified*, *leadership differentiated*, *generativity*, and *integration/synthesis* (Figure 1). Five types of influences contribute to changes in leadership identity, including developmental influences, developing self, group influences, changing view of self and others, and broadening view of self and others (Komives et al., 2006). Progression within the LID model is strongly influenced by environmental factors, such as meaningful group involvement, supportive and mentoring relationships with adults, peer relationships, and opportunities for critical reflection (Komives et al., 2006). However, it is the change in leadership thinking that signals the transition from stage to stage, with the concept of leadership generally progressing from noninvolvement in leadership to positional, hierarchical leadership to non-positional, process oriented, systemic leadership (Komives et al., 2006; Komives et al., 2005). The most effective leaders within the LID (*integration/synthesis stage*) are characterized in part by a confidence in one's ability to adopt a positional, hierarchical *or* a non-positional, process oriented, systemic style of leadership based on the context of the situation (Komives, 2011).

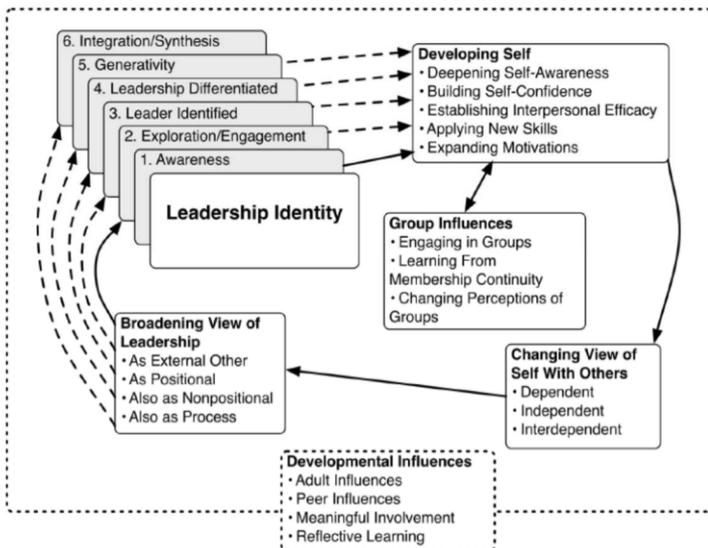Figure 1: A Grounded Theory of Leadership Identity Development

Figure 1: A Grounded Theory of Leadership Identify Development. From Leadership identity development: Challenges in applying a developmental model, by Komives, Longerbeam, Mainella, Osteen, and Owen, 2009, *Journal of Leadership Education, 8*(1), 11-47. Copyright by

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Leadership Thinking Assessment

The Leadership Attitudes and Beliefs Scale (LABS) is an instrument which assesses the strength of one's thinking about hierarchical and systemic leadership processes (Wielkiewicz, 2000, 2002). The LABS consists of two orthogonal scales: the Hierarchical Thinking scale consists of 14 items, tailored to the belief that organizational leadership should be allocated by position, and positional leaders are responsible for the success or failure of the organization. The Systemic Thinking scale also consists of 14 items, tailored to the belief that organizational leadership should be every individual's responsibility, and the idea that open communication and adaptability provide a stronger chance for an organization's success (Wielkiewicz, 2000, 2002). Since the LABS assesses the strength of one's thinking about hierarchical and systemic leadership, the scale can be used to assess progression from the *leader identified* stage to the *leadership differentiated* stage within the LID model (Komives et al., 2005). The current study used the LABS as the primary assessment device.

Development of Leadership in College Students

Students tend to enter college with a hierarchical view of leadership, believing the concepts of "leadership" and "leader" are synonymous (Komives et al., 2006; Komives, Lucus, & McMahon, 2007; Renn & Ozaki, 2010; Wielkiewicz et al., 2012). Thus, according to the LID model, the ability of colleges and universities to facilitate progression in leadership thinking from a leader-centric approach to systemic approach, and therefore from the *leader identified* stage to the *leadership differentiated* stage within the LID model, is critical in developing highly effective leaders (Komives, 2011; Komives et al., 2006; Komives et al., 2007; Renn & Ozaki, 2010; Wielkiewicz et al., 2012).

Effectiveness of Leadership Programs in Developing Leaders

Many colleges and universities utilize formal leadership development programs to help develop the leadership capacities of students; however, the effectiveness of these programs varies. While short- and moderate-term leadership programs have been found to enhance students' leadership capacity (Dugan & Komives, 2010), long-term programs, such as majors, minors, and certificate programs, are shown to have no significant effect (Dugan, Bohle et al., 2011) or even a negative effect on students' leadership capacity development (Dugan & Komives, 2010). However, these findings may not be due to the type of leadership program, but rather an incongruence between the leadership outcomes assessed and the type of leadership being taught (Dugan, Bohle et al., 2011) and/or the degree to which high-impact methods, such as reflective learning and mentorship, were utilized within those experiences (Dugan, Bohle et al., 2011; Dugan & Komives, 2010).

Inspiring Leaders Certificate Program

The Inspiring Leaders Certificate Program (ILCP), established at the College of Saint Benedict and Saint John's University in 2006, is the focus of this study (College of Saint Benedict & Saint John's University, n.d.). This program is best classified as a campus-wide comprehensive student leadership program, as described by Haber (2006). Consistent with best practices in leadership program design (Haber, 2006), the ILCP has a clear mission and set of core values, which are consistent with the mission and values of the College/University. Additionally, the ILCP is theoretically anchored in the ecological model of leadership development (Allen, Stelzner, & Wielkiewicz, 1998; Wielkiewicz & Stelzner, 2005), a model developed at the College of Saint Benedict and Saint John's University. Finally, the ILCP identifies specific learning outcomes, implementation strategies, and assessment methods to help ensure success of the program.

The ILCP offers students the opportunity to earn seven leadership certificates, including four themed certificates and three sequenced certificates. Three of the themed certificates, Intercultural Competency, Gender and Leadership, and Civic Leadership, are open to all students. The fourth certificate, Professional Development, is intended for students in student employment leadership positions. Each of these certificates is intended to promote self-awareness, develop understanding of self in relationship to others, and enhance communication and relationship building skills. The classes associated with each certificate utilize traditional cognitive methods of teaching and learning, including lecture and discussion, and incorporate some active learning methods, such as role playing. However, Professional Development is unique in that it provides greater experiential learning opportunities for students. Since almost all of the students are in student employment leadership positions, they have the opportunity to apply their newly acquired leadership knowledge and skills in real world situations with a supervisor to mentor them. As a result, this certificate, in collaboration with the Office of Student Employment, provides greater opportunity for assessment, challenge, and support, three important teaching components associated with high quality leadership development programming (McCauley et al., 1998).

The Life Skills, Practicing Leadership, and Personal Leadership Model Certificates are sequential and designed to promote: 1) self-awareness as a leader, 2) an understanding of self as a leader in relation to others, and 3) an understanding of self as a leader within the context of a larger community. The capstone to the Personal Leadership Model Certificate is a self-designed leadership project that demonstrates the student's personal value-based leadership philosophy at the level of the campus or greater community (for example, a student-designed and implemented 360-degree leadership development survey for resident assistants). Self-reflection on both the process and outcome of the project are part of the final summary report.

In order for a student to earn a particular certificate, the student must complete six or seven non-academic classes from a list of required and optional classes for that particular certificate. Each class is approximately an hour in length. While the content and teaching methods vary, the participants are consistently provided informal feedback regarding their leadership knowledge and skills. Upon completion of the specified classes, the student must submit a formal reflective essay that is evaluated by the program director using a standardized

rubric. The student receives feedback regarding their leadership development and, if judged to be sufficient, the student is granted the certificate. If the reflection is not sufficient, the student is advised to think about the formative comments provided and seek additional support as necessary. The student may then revise and resubmit the reflection essay.

While the specific content and structure of the ILCP may be unique to the College of Saint Benedict and Saint John's University, the general structure of the program is consistent with best practices in leadership development, as described by Haber (2006). Furthermore, the program's implementation strategies and intended outcomes are likely similar to leadership development programs at other colleges/universities. As an example, the ILCP uses a multi-method approach to leadership development, incorporating both cognitive and experiential methods, to help students broaden their understanding of leadership, better understand themselves in relationship to others, and develop the skills necessary to effectively engage in the process of leadership, consistent with LID theory (Komives et al., 2005). Finally, the ILCP provides adult mentorship, peer interaction, and reflective learning opportunities for students, again consistent with LID theory (Komives et al., 2005). Therefore, we believe the results of this study can be generalized to leadership development programs at other colleges/universities.

Purpose

The purpose of the current exploratory research study is two-fold: 1) examine the overall changes in leadership attitudes and beliefs of students during their four-year college experience; 2) examine the differential impact of participation in a leadership certificate program, common college experiences, and demographic factors in bringing about desired changes in students' leadership attitudes and beliefs during their four years of college.

Method

A prospective pre-test/post-test quasi-experimental design was used to assess the effect of participation in a leadership certificate program on students' leadership attitudes and beliefs. The study compared data collected in the fall of the students' first year of college (T1), prior to any formal college leadership development activities, to data collected in the spring semester of the students' senior year (T2). In addition, changes in leadership attitudes and beliefs were compared across student participation in a wide variety of curricular, co-curricular, and volunteer activities, as well as demographic characteristics, to identify factors influencing leadership development.

Participants

Participants were students at two private, Catholic, single-sex, liberal arts institutions that share a single integrated academic curriculum. While the men and women reside on separate campuses, the co-educational programs consist of both integrated and gender specific experiences. In the fall of 2007, incoming first-year students at the two institutions were surveyed regarding their leadership beliefs and attitudes (Fischer et al., 2010).

Procedure

Baseline data were collected prior to the start of the 2007-2008 academic year and prior to any formal discussion of leadership during first-year orientation activities (Fischer et al., 2010). Nine hundred and eight ($N = 908$) of the 1055 incoming first-year students (86% of the incoming first-year class) completed and returned the questionnaire (Fischer et al., 2010). In the spring of 2011, the graduating seniors were asked to complete a follow-up electronic questionnaire that took approximately 20 minutes. Students who completed the follow-up survey were entered into a drawing for one of two $100 gift cards and four $50 gift cards to a local electronics store as participation incentives.

Of the 812 (females: $n = 425$; males: $n = 387$) students who graduated from the two institutions in the spring of 2011, 423 students completed the follow-up questionnaire, a participation rate of 52.1 % for the two graduating classes according to official Registrar data. Of the 423 students who completed the follow up survey, 386 (females: $n = 238$; males: $n = 148$) had also completed the baseline (T1) questionnaire. The final sample of 386 senior students represented 42.5% of the students who completed the survey as first-year students. The 37 students that completed the T2 survey but did not complete the T1 survey were excluded from the analysis. A summary of participant characteristics is provided in Table 1.

Table 1
Frequency of Demographic Characteristics of Study Participants

Characteristic	Males (n = 148)	Females (n = 238)	Total (N = 386)
First Generation College Student[a]	39	69	108
Race/Ethnicity:			
American Caucasian Student	139	228	367
American Student of Color	3	6	9
International Student	4	4	8
Positional Leadership Roles (Y/N):			
Student Senate	9	12	21
ROTC[b]	3	5	8
ILEAD Program[c]	1	6	7
Orientation Leader	26	18	44
Alternative Break Experience Leader	4	10	14
Resident Assistant	9	14	23
Captain Intercollegiate Athletics	26	23	49
Captain Club Sport	9	14	23
Student Employment Manager	35	71	106
SAAC Member[d]	7	12	19
Student Organization Officer	39	74	113
Participation in… (Y/N)			
Study Abroad	57	111	168
Club/Organization	80	162	242
Intercollegiate Athletics	56	49	105
Institute for Women's Leadership	0	9	9
Service Learning	63	151	214
Internship	48	62	110
Nursing Practicum	1	26	27
Teaching Practicum	15	34	49
Other Academic Service Activity	45	84	129
Completed the ILCP… (Y/N)			
Life Skills Certificate	6	30	36
Practicing Leadership Certificate	1	16	17
Personal Leadership Model Certificate	1	5	6
Professional Development Certificate	4	15	19
Intercultural Competency Certificate	2	13	15
Gender and Leadership Certificate	1	0	1
Civic Leadership Certificate	0	1	1

[a]First Generation College Student is defined by the institutions as a student whose parents did not graduate from college; [b]ROTC = Reserve Officers' Training Corps; [c]ILEAD Program = Intercultural Leadership, Education and Development Program; [d]SAAC = Student Athlete Advisory Committee

Instruments

The primary assessment device for the baseline questionnaire was the LABS, which consists of 28 statements related to leadership and organizational adaptability. It has two orthogonal subscales, Hierarchical Thinking (14 items) and Systemic Thinking (14 items), with alpha coefficients of .88 and .84 respectively (Wielkiewicz, 2000). Response options were *strongly agree* (1 point), *agree*, *neither agree nor disagree*, *disagree*, and *strongly disagree* (5 points). Consequently, lower scores in Systemic Thinking and Hierarchical Thinking are associated with stronger beliefs in each area. The convergent and discriminative validity of the Systemic and Hierarchical Thinking scales have been established (Wielkiewicz, 2002).

The follow-up questionnaire included the LABS and demographic questions pertaining to gender, culture, and first generation college student status. The survey also included a series of dichotomous (Yes/No) questions regarding participation in curricular and co-curricular activities. These activities were included in the survey because they were linked with leadership development on campus or were similar to the types of activities associated with leadership development in the literature. Table 1 identifies the activities included in the survey.

The follow-up questionnaire also included the Lifelong Learning Scale (LLS) (Wielkiewicz & Meuwissen, in press). The LLS consists of 16 items designed to assess the attitudes and behaviors associated with learning over the lifetime, particularly reading, critical thinking, and curiosity. Response options are *never* (1 point), *rarely*, *sometimes*, *often*, and *always* (5 points). Thus, higher LLS scores reflect a more positive orientation toward lifelong learning. The reliability of the LLS was found to be .915 (Wielkiewicz & Meuwissen, in press).

A change in Hierarchical Thinking score was calculated for each participant by subtracting the T1 Hierarchical Thinking score from the T2 Hierarchical Thinking score. Therefore, a negative change in Hierarchical Thinking score indicates a greater affinity for hierarchical leadership at T2 compared to T1. Similarly, a change in Systemic Thinking score was calculated for each participant by subtracting the T1 Systemic Thinking score from T2 Systemic Thinking score. Again, a negative change in Systemic Thinking score indicates a greater affinity for systemic leadership at T2 compared to T1.

In addition to survey data, information pertaining to each student's cumulative grade point average at graduation and study-abroad participation was obtained from the Registrar's Office. Data regarding participation in the ILCP classes and ILCP certificates earned was obtained from the Department of Student Activities and Leadership Development.

Results

Analysis

Using SPSS 19.0 for Windows with alpha set at .05, this longitudinal study employed stepwise regression to explore the differential effect of 33 independent variables on changes in students' thinking about hierarchical and systemic leadership from the days prior to the start of the students' first year of college to spring semester of the students' senior year. A stepwise

regression was utilized due to the large number of independent variables and the limited empirical evidence regarding the differential impact of student experiences and student characteristics on leadership development. Additionally, mixed-design analysis of variance tests, dependent *t*-tests, and Cohen's *d* effect size measures were used to examine how the dependent and select independent variables changed over the course of the students' college years. Finally, Fisher's *Z*-transformation was used to test the hypothesis that the correlation between Systemic and Hierarchical Thinking would decline from the start of the students' first year of college to spring semester of the student's senior year, thus indicating the development of a more sophisticated understanding of leadership over the students' college years.

Demographic Information

A chi-square goodness of fit test revealed significant differences in the culture ($p = .011$) and gender ($p < .001$) composition of the study participants compared to the expected composition of the group based upon official Registrar data. Male students, American Students of Color, and International students were underrepresented in the study relative to the actual graduating classes at the two institutions. Table 1 shows the frequency of participants' demographic characteristics.

Reliability of Measures

Cronbach's alphas for Hierarchical Thinking, Systemic Thinking, and LLS scales at T2 were .824, .831, and .902, respectively. The reliabilities of the Hierarchical Thinking and Systemic Thinking measures associated with the baseline questionnaire were .827 and .824, respectively (Fischer et al., 2010).

Analysis of Leadership Scores

Dependent *t*-tests revealed significant differences in aggregate Systemic Thinking scores at T1 ($M = 28.02, SD = 6.516$) and T2 ($M = 25.13, SD = 5.063$), $t(355) = 7.355, p < .001; d = 0.50$ and significant differences in aggregate Hierarchical Thinking scores at T1 ($M = 39.70, SD = 6.583$) and T2 ($M = 41.70, SD = 6.838$), $t(344) = -5.030, p < .001; d = 0.30$, indicating stronger beliefs in Systemic thinking and a weakening of beliefs in Hierarchical thinking across time.

Fisher's *Z*-transformation was used to test the hypothesis that the correlation between Systemic and Hierarchical Thinking would decline from T1 to T2. A decline in the correlation would indicate students viewed the two dimensions of leadership as more independent of each other at T2 compared to T1. Hierarchical and Systemic Thinking scores were correlated at T1, $r(363) = .283, p < .001$, and at T2, $r(347) = .165, p = .002$. The difference between these correlations was statistically significant for a one-tailed test, $Z = 1.650, p = .05$, thus supporting the hypothesis.

Predictors of Change in Hierarchical Thinking Scores

A stepwise multiple regression analysis was performed to determine the most important influences upon changes in Hierarchal Thinking scores. Twenty-nine dichotomous variables

(gender, first generation college student status, and the 27 dichotomous variables presented in Table 1) and four quantitative variables (LLS, GPA, number of semesters the student engaged in service activities associated with academic courses (SAAAC), and number of ILCP classes completed) were entered into the analysis. In addition, Culture data were transformed to create a linear variable relative to the mean change in Hierarchal Thinking scores for each cultural group and was included in the regression analysis. The final model to emerge from the stepwise multiple regression analysis contained only one predictor variable for the change in Hierarchal Thinking scores, Culture ($\beta = .137$), which accounted for 1.6% of the variance (Adjusted $R^2 = .016$; $F_{1, 331} = 6.378$, $p = .012$).

Analysis of Hierarchical Thinking Scores by Culture

A 2x3 mixed ANOVA (Time x Culture) revealed a significant main effect for the change in Hierarchical Thinking scores over time [$F (1,341) = 25.459$, $p < .001$], but no significant main effect for Culture [$F(2,341) = 1.045$, $p = .353$]. A significant interaction between Culture and Time was found [$F(2,341) = 3.083$, $p = .047$]. Follow-up dependent t-test results are shown in Table 2. These results indicate the hierarchical leadership beliefs of American Caucasian students became slightly to moderately weaker, American Students of Color became moderately stronger, and International students remained essentially unchanged from T1 to T2.

Table 2

Comparison of Mean Hierarchical (HIER) and Systemic (SYST) Thinking Scores at T1 and T2 – Culture Group Classification

Race/Ethnicity		T1		T2				
		M	SD	M	SD	t	p value[a]	Effect Size
Amer Cauc[b]	HIER	39.70	6.598	41.90	6.720	5.435	$p < .001$	$d = 0.33$
Amer SOC[c]	HIER	40.56	6.327	37.00	8.367	1.931	$p = .090$	$d = 0.48$
International	HIER	38.86	7.537	38.43	8.848	0.120	$p = .909$	$d = 0.05$
Amer Cauc[b]	SYST	28.09	6.414	25.15	4.959	7.484	$p < .001$	$d = 0.51$
Amer SOC[c]	SYST	29.56	9.876	22.33	4.924	1.663	$p = .135$	$d = 0.93$
International	SYST	25.25	6.089	27.50	8.435	0.928	$p = .348$	$d = 0.31$

[a]Two-tailed dependent t-test; [b]Amer Cauc = American Caucasian; [c]Amer SOC = American Students of Color

Predictors of Change in Systemic Thinking Scores

A stepwise multiple regression analysis was used to determine the most important influences upon the change in Systemic Thinking scores. Twenty nine dichotomous variables (gender, first generation college student status, and the 27 dichotomous variables presented in Table 1) and four quantitative variables (LLS, GPA, number of SAAAC semesters, and number of ILCP classes completed) were entered into the analysis. In addition, Culture data were transformed to create a linear variable relative to the mean change in Systemic Thinking scores for each cultural group and was included in the regression analysis. The final model to emerge from the stepwise multiple regression analysis contained only one predictor variable for the

change in Systemic Thinking scores, Completion of the Professional Development ILCP Certificate (β = -.115), which accounted for 1.0% of the variance (Adjusted R^2 = .010; $F_{1, 340}$= 4.581, p = .033).

Analysis of Systemic Thinking Scores by Completion of Professional Development Certificate

A 2x2 (Certificate Completion x Time) mixed ANOVA revealed a significant main effect for the change in Systemic Thinking scores over time [$F(1,353)$ = 53.731, $p < .001$], but no significant main effect for completion of the Professional Development Certificate [$F(1,353)$ = 1.410, p = .236]. A significant interaction between completion of the Professional Development Certificate and Time was found, $F(1,353)$ = 4.132, p = .043. Follow-up dependent t-tests revealed a significant difference in Systemic Thinking scores at T1 (M = 28.53, SD = 10.091) and T2 (M = 21.87, SD = 4.470), $t(14)$ = 2.512, p = .025; d = 0.85 for the students that completed the Professional Development Certificate and a significant difference in Systemic Thinking scores at T1 (M = 27.96, SD = 6.305) and T2 (M = 25.25, SD = 5.039), $t(339)$ = 6.890, $p < .001$; d = 0.47 for the students that did not complete the Professional Development Certificate. The systemic leadership beliefs of those students who did and did not complete the Professional Development Certificate became stronger, but this change was much stronger for those who did complete the certificate.

Discussion

Overall Changes in Leadership Attitudes and Beliefs

Incoming first-year college students hold predominantly hierarchical views regarding leadership, identifying with the *exploration/engagement* or *leader identified* stage of the LID model (Komives et al., 2006; Wielkiewicz et al., 2012). Incoming first-year college students also have difficulty distinguishing between systemic and hierarchical leadership styles, as shown by the significant correlation between Systemic Thinking and Hierarchical Thinking scores at T1. During college, students develop a more sophisticated understanding of leadership as evidenced by the significant decline in the correlation between Systemic Thinking and Hierarchical Thinking scores at T2 compared to T1. In other words, by the time the students graduated from college, they were better able to differentiate between systemic leadership and hierarchical leadership and thus, had made significant progress toward *leadership differentiated* stage and possibly, the *generativity* stage, within the LID model. Similarly, the shift toward stronger systemic leadership beliefs and weaker hierarchical leadership beliefs is considered progress within the ecological leadership model (Allen et al., 1998; Wielkiewicz & Stelzner, 2005). However, the results also indicate there is room for additional improvement; skilled leaders within ecological leadership theory are characterized by strong beliefs in both hierarchical and systemic forms of leadership (Wielkiewicz & Stelzner, 2005).

Leadership Programming in Predicting Leadership Development

Prior research suggests long-term leadership programs, such as certificate programs, have no significant effect on leadership development (Dugan, Bohle et al., 2011) or, even worse, a

negative effect on students' leadership development (Dugan & Komives, 2010). The results of the present study indicate certificate programs can have a positive effect on leadership capacity development, and more importantly, they can have a greater impact on leadership development than other college experiences. Of the 33 independent variables examined, completion of the Professional Development Certificate was the only factor to significantly contribute to students' systemic leadership development, which indicates progression toward more advanced stages of leadership development within the LID model (Komives et al., 2006).

An equally important finding is six of the seven leadership certificates did not predict students' systemic leadership development. In examining the structure and content of the seven leadership certificates, we found, to a greater or lesser degree, all the certificates addressed the critical elements purported to enhance leadership development within LID theory (Komives et al., 2005). Each of the certificate programs were designed to promote leadership capacity by developing self-awareness, communication and relationship building skills, enhanced understanding of self in relationship to others, and understanding of the importance of balancing hierarchical and systemic leadership approaches based on the needs of the situation. Active learning methods encouraged students to apply newly developed leadership skills to novel situations, engaged students in group discussions about leadership, and enabled students to view themselves as capable of making a positive change in the world. Finally, instructors and program leaders encouraged students, provided feedback, and facilitated reflective learning. However, the Professional Development Certificate, through its collaboration with the Office of Student Employment, provided students a richer and more meaningful set of group and developmental influences. In addition, while this certificate is open to all students, participation was strongly encouraged or required as a condition for some student employment hires. As a result, there was likely greater participation by students who otherwise would not have participated in leadership development programming.

Based on anecdotal information, students who completed the Professional Development Certificate were more likely to have a close working relationship with a student development staff person, such as their direct supervisor, who was familiar with the content of the certificate and valued the leadership development of their student staff. Participation in the Professional Development Certificate classes then provided students with leadership education, including awareness of self, understanding of self in relation to others, and a broadening understanding of balanced leadership. However, unlike the other certificates, the leadership positions provided students greater opportunity to struggle with meaningful leadership challenges while being mentored or coached by an adult staff member. By creating a culture of leadership development, these supervisors were positioned to guide students through the "trigger events" that, in turn, may have led to accelerated leadership development (Avolio & Hanna, 2008, p. 334). Komives et al. (2005, p. 596) describe this type of environment as having positive "developmental influences," while Avolio and Hanna (2008, p. 341) describe the nurturing environment as an "organizational developmental readiness" climate.

It is important to note, when examined in isolation, holding a resident assistant or student employment manager position was not significantly related to change in Systemic Thinking scores. Therefore, the combination of the Professional Development Certificate and the positional leadership experience was necessary to promote significant systemic leadership

development. These findings support the assertion that developing leadership capacity is a function of embedding "high impact learning strategies" into leadership experiences rather than the specific type of leadership experience (Dugan, Bohle et al., 2011, p. 76). Therefore, we believe a collaborative relationship between departments responsible for leadership development programming and departments that provide leadership opportunities for students, such as student employment, can be an effective model for facilitating the development of college students' leadership capacity.

The Professional Development Certificate program also differs from the other leadership certificate programs in that student participation was not purely voluntary. As a result, the baseline leadership characteristics of the students completing the certificate were similar to the students who did not complete the program. More specifically, students who completed the Professional Development Certificate had T1 Systemic Thinking scores that were similar to the students who did not complete the certificate. However, students who completed the other certificates, tended to have stronger beliefs in systemic thinking at T1 compared to students that did not complete these certificate programs, and therefore, were more advanced in their leadership development entering college. This distinction is important because previous research suggests students who self-select into leadership development programs tend to view themselves as leaders, be more developed in their leadership capacity, and benefit the least from leadership programming (Astin & Astin, 2000; Dugan, Bohle et al., 2011; Dugan & Komives, 2007; Thompson, 2006).

Demographic Variables and Student Experiences in Predicting Leadership Development

Other than the Professional Development Certificate, cultural background was the only variable to significantly predict leadership development. At baseline, incoming first-year American Caucasian, American Students of Color, and International students were similar in hierarchical and systemic leadership beliefs. The college experience, as a whole, influenced students' systemic leadership beliefs similarly. However, the college experience had a significantly different effect on the students' attitudes and beliefs regarding hierarchical leadership. American Caucasian students developed slightly to moderately weaker hierarchical leadership beliefs compared to baseline, while American Students of Color became moderately stronger in their hierarchical leadership beliefs, and International students remained essentially unchanged. The reason for the differential impact is unclear and previous research regarding the effect of cultural background on leadership development during college is scarce.

When viewed within the context of the LID model, the strengthening of both hierarchical and systemic views of leadership may indicate American Students of Color made significant progress toward the *leadership differentiated* stage within the LID model, but were cycling back through the *leader identified* stage. However, when viewed within the context of the ecological model of leadership, the results indicate American Students of Color more fully embraced both hierarchical and systemic approaches to leadership, indicating a more advanced leadership capacity compared to American Caucasian students (Wielkiewicz & Stelzner, 2005). The notion American Caucasian students' leadership capacity is not as developed as students from other cultures is not unprecedented. Dugan, Rossetti Morosini, and Beazley (2011) found Mexican students left college with greater leadership capacity than their peers in the United States.

Clearly, more research is needed to identify and explain potential cultural differences in college students' leadership development.

Limitations

Readers should recognize and remember three important limitations when interpreting the results of this study. First, the students surveyed for this study were from two colleges with unique institutional profiles and a coordinated relationship. This may limit the generalizability of the findings. However, research by Wielkiewicz et al. (2012) indicates incoming first-year students' leadership attitudes and beliefs at the two colleges are similar to students at other colleges in the United States. Second, as noted previously, the subject population is small and not representative of overall enrollments with women and American Caucasian students being overrepresented. Finally, the clustering of non-American Caucasian students into two broad culture categories (International students and American Students of Color) limits the ability to generalize the findings of this study. Since the exact racial/ethnic makeup of the students is unknown, the ability to generalize the findings to a specific race/ethnic group (for example, Asian Americans) or to another group with diverse ethnic backgrounds was limited.

Conclusion

In recent years, there has been a call for research to examine the effectiveness of formal leadership programs (Ayman et al., 2003), particularly the differential impact of leadership programs relative to other college experiences (Dugan, Bohle et al., 2011; Fischer et al., 2010). This study utilized a prospective pre-test/post-test quasi-experimental design to assess the differential effect of participation in a leadership certificate program and of common college experiences purported to be associated with leadership development on students' leadership attitudes and beliefs over time. The results indicate the overall college experience strengthens students' belief in systemic leadership and weakens their belief in hierarchical leadership, indicating progression from hierarchical dominant stages to systemic dominant stages within LID theory (Komives et al., 2005). Completion of a comprehensive leadership certificate intended for students in student employment leadership positions predicts systemic leadership belief development; however, completion of similar leadership certificates open to all students did not predict development of students' systemic leadership beliefs. We believe two primary factors led to the differential effect. First, due to the collaboration of the leadership program professionals and the student employee supervisors, students in the leadership positions were provided a richer and more meaningful environment for leadership development, which facilitated the development of their systemic leadership beliefs. Second, participation by students holding student employment leadership positions was not completely voluntary, and this may have led to students in student employment leadership positions holding less developed leadership beliefs at the beginning of the study. The implication is that students participating in voluntary leadership programs may already be fairly sophisticated in their leadership thinking and therefore are not affected as greatly by leadership development activities.

The results of this study support the need for a critical self-assessment of leadership programs, as suggested by Dugan, Bohle et al. (2011), in order to identify methods and strategies that are effective in facilitating the leadership development of college students. The practice of

critical self-examination through empirical research will allow leadership development professionals to better make prudent decisions regarding resource allocation in leadership programming and reduce the perpetuation of untested "best practices" in leadership development. Future research should look to replicate the prospective, longitudinal design of the current study, utilize assessment tools that are consistent with the theoretical framework of the particular program, and provide perspective regarding the relative impact of the program, compared to other common college experiences, in developing leadership capacity. Furthermore, particular attention should be paid to the impact of leadership development programs on students within subpopulations. The results of the current study indicate ethnic differences may exist. However, the small number of non-Caucasian students participating in this study and the broad classification method utilized limits the robustness of this finding.

Finally, we found the LID model to be useful in conceptualizing the process of leadership development and, therefore, of great potential value in evaluating the effectiveness of leadership development programs. Future research should look to establish objective, valid, and reliable measures that can be used to classify students within each LID stage. This will allow leadership development professionals to more accurately and efficiently track students' development over time. Additionally, the results of the current study indicate the methods and strategies employed by the ILCP may be more effective with students who have a stronger hierarchical and less systemic view of leadership, compared to students with a more developed set of leadership attitudes and beliefs. This finding suggests the ability to accurately and efficiently classify large numbers of students within the LID model may allow researchers to identify effective stage-specific methods and strategies for developing the leadership capacity of college students.

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Author Biographies

Donald V. Fischer, MSPT, is an associate professor of Exercise Science and Sport Studies at the College of Saint Benedict and Saint John's University. His research interests include sport performance and injury prevention, and leadership development in college students.

Richard M. Wielkiewicz, Ph.D., is a professor of psychology at the College of Saint Benedict and Saint John's University. He teaches courses in the principles of learning, statistics, and tests and measures. His main research interests include lifelong learning and leadership development in college students.

Stephen P. Stelzner, Ph.D., is a professor of psychology at the College of Saint Benedict and Saint John's University. He teaches courses in organizational, community, and developmental psychology. His scholarly work has focused on using social ecological principles to change social systems, including the development of ethical and sustainable leadership.

Maribeth Overland has a M.S. in Communication and Leadership and is Director of Student Activities and Leadership Development at the College of Saint Benedict and Saint John's University. She also directs the ILCP program described in the present paper and she should be contacted regarding questions about the program.

Alyssa S. Meuwissen earned her B.A. from the College of Saint Benedict and Saint John's University in the spring of 2012. She is attending graduate school at the University of Minnesota, Institute for Child Development.