

How Are We Educating Agricultural Students? A National Profile of Leadership Capacities and Involvement in College Compared To Non-Agricultural Peers

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Given the importance of leadership development within the various agricultural professions, a national sample (n=461) of students with agriculture-related majors from 55 colleges was compared to a similarly-sized random peer group from the same institutions. The data were analyzed to compare the agricultural student sample to their peers with respect to a variety of social identities (e.g. race, gender, political leanings); high school and college involvement and leadership positions held within co-curricular activities and organizations; and scores from several measures of leadership-related outcomes. These outcomes included socially responsible leadership practices, leadership efficacy, social change behaviors, cognitive complexity, and the degree to which students participate in socio-cultural discussions. Findings suggest that while agricultural students display similar levels of involvement and leadership in high school and higher levels in college, they do not make some of the same leadership outcome gains in college as the comparison population. These findings hold important implications for the way agricultural educators structure classroom environments and how they advise student organizations.

Keywords: college students, student leadership skills, student involvement

Institutions of higher education have exhibited a strong commitment to leadership development since their inception, preparing professional and societal leaders for many years (Astin & Astin, 2000). Marcketti and Kadolph (2010) stressed, “The importance of leadership education for today’s undergraduate students cannot be underestimated” (p.131). As both future educators of agricultural students and contributors to the agricultural industry as a whole, colleges of agriculture play an important role in preparing students to take on these roles. Schumacher and Swan (1993) recommended the further development of leadership programs for colleges of agriculture, as “students indicated both a strong need and willingness to participate in leadership development programs” (p. 8). A recent study showed that over 1,000 higher educational institutions currently offer

leadership development programs of some form (Riggio, Ciulla, & Sorensen, 2003). Part of this increase is attributed to a shifting definition of leadership from a hierarchical, narrow conception to more strongly underscore the importance of developing relationships (Komives, Lucas, & McMahon, 2007) while acting ethically and congruent with one’s personal values (Kouzes & Posner, 2010). These skills are what many describe as necessary for success in contemporary organizations (Friedman, 2007; Seidman, 2007). Leadership and other transferable skills are developed through various means, including training, personal experience, observation and reflection, and education (Brungardt, 1996; Marcketti & Kadolph, 2010; The National Academies, 2009).

Regardless of the continuing shift in definition, “leadership skills” is a general trait

desired by employers seeking job candidates (National Association of Colleges and Employers, 2011; Astin & Astin, 2000). Moreover, the training of a “scientific and professional workforce that addresses the challenges of the 21st century (Doerfort, 2011, p. 9) is one of the six key research priorities of the American Association of Agricultural Educators (AAAE). Powell and Agnew (2007), writing for agricultural educators, emphasized, “leadership is a valued attribute for employers and for society in general, one which is expected of university students upon graduation” (p. 11). Birkenholz and Schumacher (1994) reported a strong need for future agricultural leaders, where educators must develop and implement strategies that develop the future of the field. Ewing, Bruce, and Ricketts (2009) noted the collegiate environment as ideal for leadership development with ample opportunities such as student service programs, collegiate student organizations, and service learning projects. To meet this expectation of leadership attributes, students must be engaged in the numerous opportunities available during their collegiate experience.

Students who participate in co-curricular opportunities available on campus have a clear advantage over students who choose not to engage in these means of leadership development (Astin, 1999; Foubert & Grainger, 2006; Kuh, 1995); Freeman and Goldin, 2008). Additionally, Ewing, Bruce, and Ricketts (2009) noted, “leadership skill and ability may be perceived as higher for members of collegiate organizations when compared with non-members” (p.120). Despite its perceived benefits, student engagement and involvement in leadership development through coursework, programming, and student organizations can be a challenge at colleges and universities. Powell and Agnew (2007) emphasized, “Since student participation in these organizations is usually not required, faculty and organizational advisors often struggle with how to increase student participation in leadership development activities through these organizations” (p. 11). Discovering why some students choose not to participate in such beneficial experiences is an area in need of further exploration (Ewing, Bruce, & Ricketts, 2009). Although Shertzer and

Schuh (2004) found that, “student leaders generally will emerge without needing to be pushed and can be trusted to serve in their roles without much supervision because of their leadership experience” (p.127), additional opportunities would continue to deepen the leadership capacity of these students. Connors, Velez, and Swan (2006) observed there may be a gap in student awareness of leadership development opportunities on campus (formal and informal). Investing in student leadership development at all levels of experience and involvement can positively impact both the current and future roles of these young leaders.

Although collegiate student leadership development tends to be a focus for career preparation, it has been well established that leadership development begins prior to college enrollment (Park & Dyer, 2005; Allen, Ricketts, & Priest, 2007). Several researchers have suggested the positive impact of high school or agricultural organization involvement (FFA, 4-H, etc.) on leadership development and preparation in students (Allen, Ricketts, & Priest, 2007). Based on Ajzen’s (1991) Theory of Planned Behavior, Allen, Ricketts, and Priest (2007) inferred “one could predict that students who serve as officers in high school organizations (intention) develop self-efficacy about leadership (perceived behavioral achievement) and will serve as officers and/or in other leadership roles in collegiate and professional organizations (behavioral achievement)” (p. 57). Allen, Ricketts, and Priest (2007) challenged educators to continue asking, “Does the pre-college leadership education experience have any effect on a college student’s involvement in leadership roles while enrolled in college or after graduation?” (p. 56). Transitions in maturity and leadership experience occur from high school involvement to leadership opportunities in collegiate organizations. Connors, Velez, and Swan (2006) stressed that “it is critically important that faculty, advisors, researchers, and administrators in land-grant university colleges of agriculture pay close attention to the leadership development of the undergraduates in their institutions” (p. 95).

Leadership Education in Agricultural Education

Agricultural students, in particular, are no exception to the increasing need for prepared graduates with the skills necessary to lead in their respective communities and careers. Leadership has been associated with agricultural and extension education for decades (Connors & Swan, 2006). The AAAE has joined the call for graduates prepared for positions of influence in their communities, adding 21st Century workforce preparation, the influence of social structures within agricultural education programs, and the creation of engaged, vibrant communities to its current national research priorities (Doerfort, 2011). Based upon the National Standards for Teacher Education in Agriculture adopted by the American Association for Agricultural Education (AAAE), education programs are to develop the skills and knowledge for all content areas teachers may be expected to teach, including the content area of leadership (Simonsen & Burkenholz, 2010). Connors, Velez, and Swan (2006) stressed that “agricultural businesses, commodity organizations, non-profit groups, and government agencies need competent leaders who will provide direction and vision for the future of the agricultural industry (p. 94). The National Academies’ 2009 *Transforming Agricultural Education for a Changing World Report in Brief* highlighted, “This agricultural workforce must constantly respond to changes in the physical, economic, and social environment surrounding agriculture” (p.1), and that “academic institutions with programs in agriculture are in a perfect position to foster the next generation of leaders and professionals needed to address these challenges” (p.1). Course development within colleges of agriculture reflects the realization of leadership as an important skill for undergraduate students (Park & Dyer, 2005). Allen, Ricketts, and Priest (2007) noted, “There is a need for strong leaders in the agricultural industry, and organizations are looking for college of agriculture graduates who demonstrate strong leadership abilities” (p. 56). Therefore, colleges of agriculture should “position themselves at the cutting-edge and offer students the opportunity to learn about the

complexities of agriculture, grapple with its emerging challenges, and find their opportunity to contribute as leaders and participants” (The National Academies, 2009, p. 1). Considerable ground has been made in colleges of agriculture to develop leadership courses and programs; however, continued assessment and development of courses must occur to maintain content reflective of prior student experiences and industry needs for graduates (Park & Dyer, 2005; Engbers, 2006; Ewing, Bruce, & Ricketts, 2009; Dugan & Komives, 2007). This transformation and adaptation will take time, but it must begin now in order to reflect the needs of the agricultural industry and engage students entering colleges of agriculture from the first day they step on campuses.

Theoretical Framework

The theoretical frame employed within this study is founded upon Astin’s Input-Environment-Output (I-E-O) model of student learning (Astin, 1993), in which students enter the college environment with certain personal characteristics and past experiences. While there, they interact with the college environment, and the combination of inputs and the environments lead to certain outcomes. This frame was designed to measure the varying effects of involvement and positional leadership within student organizations, as well as participation in structured leadership trainings, on leadership-related outcomes while adjusting for personal differences and pre-college experiences in students. Within this study, a framework of leadership was used that is described as “a purposeful, collaborative, values-based process that results in positive social change” (Komives & Wagner, 2009, p. xii) and serves as the definition of leadership within the Social Change Model of Leadership Development (Higher Education Research Institute, 1996), an increasingly popular model of leadership taught on college campuses. This style of leadership has been described as “post-industrial” in nature (Faris & Outcalt, 2001; Kezar, Carducci, & Contreras-McGavin, 2006; Rost, 1993) in that its less hierarchical nature emphasizes personal self-knowledge and values, collaboration and social skills, and positive

social change. This can be contrasted with what has been described as “industrial” leadership, in which control, uniformity, and supervision is stressed (Faris & Outcalt, 2001).

The Social Change Model (SCM) posits that emerging college student leaders should demonstrate capacity to lead in three separate areas: an individual domain, in which they are conscious of their values and personal attributes, and exercise these attributes consciously; a group domain, in which they collaborate gracefully with others and help their groups reach common purpose; and community domain, in which they lead to create positive social change (Astin, 1996; Higher Education Research Institute, 1996). The SCM served as the model of leadership utilized within this study.

Purpose of the Study

The purpose of this study was to explore differences in involvement and leadership capacities between a group of students who identify “agriculture” as their primary major and a comparison group of students who did not identify agriculture as their primary major. Given our theoretical frame, our research questions were:

1. Do agriculture students differ from non-agriculture students with regards to personal characteristics such as race, gender, and political orientation, and if so, to what extent is the difference?
2. Do agriculture students differ from non-agriculture students in the degree of involvement they report in both high school and college involvement and leadership opportunities, and if so, to what extent is the difference?
3. Lastly, do agriculture students differ from non-agriculture students in scores of leadership capacity and efficacy, and in scores of related measures such as cognitive complexity, social change behaviors, and the degree to which they participate in socio-cultural discussion with peers? If there are differences, to what extent?

Methods

Population

This study used data collected in the spring of 2009 as part of the Multi-Institutional Study of Leadership, which included a total of 55 colleges and universities that were selected from a sample of over 150 that had responded to a call for participation (Dugan & Komives, 2010) and were included due to their diversity in Carnegie classifications, selectivity, geography, size, control, and populations of students served. From these institutions, 155,716 students were invited to participate, and 56,854 completed surveys, for a 37% response rate (Dugan & Komives, 2010).

Data Collection and Sample

All data collection was conducted during the spring 2009 semester through emails sent with links to the online survey. Simple random samples of students were invited at institutions with undergraduate enrollments greater than 4,000. For smaller institutions, their entire undergraduate population was invited. Students received an email invitation and up to three reminders.

An item on the MSL invited students to identify their “primary major” from a list of 21 options, of which an option was “Agriculture.” A total of 461 students (0.5%) selected this option – this collection of students served as the sample of interest within this study. A total of 262 (57%) identified as female, 401 (87%) as Caucasian/White, 7 (2%) as African-American/Black, 14 (3%) as Asian-American or with Asian descent, 13 (3%) as Latino/Hispanic, while 26 (5%) either identified as multi-racial or did not identify. A comparison sample should optimally be of similar size and variability to the sample of interest (Miles & Shevlin, 2004), so rather than compare the Agriculture students to the remainder of the national sample of non-Agriculture students, a simple random sample (n=461) was selected from within this group to meet the requirement of homogeneity of variance in outcome variables across both samples. Within the comparison sample, 299 (65%) identified as female, while 341 (74%)

identified as Caucasian/White, 26 (5%) as African-American/Black, 35 (8%) as Asian-American/Asian, and 19 (4%) as Latino/Hispanic, while 40 (8%) identified as multi-racial or did not identify. The gender and racial demographics for the comparison group were not statistically different from the overall profile of the national sample.

Instrumentation and Variables

The MSL was designed to reflect Astin's (1993, 1999) I-E-O model. Therefore, students were invited to respond to items regarding their personal and pre-college characteristics (Inputs), as well as their current involvements while in college (Environment). Outcomes were measured using a number of scales associated with leadership development.

Input and Environmental Variables

Students were asked to report their gender, race, and political orientation (a five-point scale from "very liberal" to "very conservative"). Demographic information regarding gender and race for the two samples were described earlier in the previous section. With regard to political orientation, 35% of the group of Agriculture students reported themselves as "conservative" and 11% as "very conservative," compared to 17% and 5%, respectively, within the peer group. Approximately 16% identified as "liberal" and 6% as "very liberal" compared to 32% and 10%, respectively, within the peer group. Approximately 32% of the agriculture students reported themselves as "moderate" compared to 36% of their comparison peers.

Students were also asked to report their remembered level of involvement in and leadership of student groups in high school ("HS Involvement" and "HS Leadership," respectively). HS Involvement was measured by a scale with a range of 4 – 16, incorporating four items focusing on governance organizations, spirit groups, performing arts organizations, and academic clubs, respectively. Students were then asked to rate their remembered leadership capacities while in high school, using a condensed version of the Socially Responsible

Leadership Scale ("SRLS Pre-test"), which will be described later. Using a "recollection proxy pre-test design," where students evaluate their remembered competencies from periods in their past, is not necessarily a valid measure of competency at the time students were asked to recall. However, it can serve as a valid means of measuring students' perceived growth in the area of interest, especially when students are asked to rate their current competencies using the same measure (Trochim, 2006). The SRLS Pre-test included nine items, with scores ranging from 1 -5. In addition, students were asked to report the current extent of their involvement in and leadership of student organizations in college. Lastly, students were invited to share the extent of their participation in leadership development training programs while in college ("COL Lead Training"), including both curricular (e.g. a leadership class) and co-curricular (e.g. a retreat or conference). Involvement and leadership in high school and college organizations were measured on four-point scales ranging from "never" to "very often," while participation in leadership trainings was measured on a five-point scale ranging from "never" to "much of the time."

Outcome Variables

The Socially Responsible Leadership Scale (SRLS) was utilized as the outcome variable measuring leadership capacity within the theoretical frame of the SCM. It has been shown to possess acceptable levels of reliability and validity (Dugan & Komives, 2007; Dugan & Komives, 2010; Slack, 2006). Also included was a scale of Leadership Self-Efficacy (LSE), designed using Bandura's model of self-efficacy (Bandura, 1997) to measure one's confidence in leading others. Scales measuring indirect leadership capacity contained within the MSL included measures of Cognitive Complexity ("CC," measuring the degree that students report growth in critical thinking skills), Social Change Behaviors ("SCB," measuring the degree to which students engage in community-minded change actions), and Socio-Cultural Discussions ("SCD," measuring the degree to which students engage in discussion with peers around topics of personal and societal differences). Each of these

scales were borrowed from the long-standing National Survey of Living Learning Programs (Inkelas, 2004; Inkelas, Vogt, Longerbeam, Owen, & Johnson, 2006). A sample item from the Cognitive Complexity scale is, “To what extent have you grown while in college in your ability to critically analyze ideas and information?” A sample item from the Social Change Behaviors scale is, “How often have you

been actively involved with an organization that addresses a social or environmental problem?” A sample item from the Socio-Cultural Discussions scale is, “How often have you discussed major social issues such as peace, human rights, and justice?” All scale items other than the LSE ranged from 1 to 5, while the LSE ranged from 1 to 4. A summary of significant variables in this study can be found in Table 1.

Table 1
Variables Examined Within This Study Collected as Part of the Multi-Institutional Study of Leadership

Input Variables	Environmental Variables	Outcome Variables
Gender	COL Involvement	Leadership capacity (SRLS)
Race	COL Leadership	Leadership Self-Efficacy (LSE)
Political orientation	COL Lead Training	Cognitive Complexity (CC)
HS Involvement		Social Change Behaviors (SCB)
HS Leadership		Socio-cultural Discussions (SCD)
SRLS Pre-test		

Data Analysis

This research was designed to investigate differences between students who report “Agriculture” as their primary major and those that do not. To compare the personal demographic data for the Agriculture students with the comparison sample, chi-square analyses were conducted for each variable. To determine the size of effect for each finding of statistical significance, Cramer’s phi was calculated (Ellis, 2010). To examine potential differences between the two groups with respect to the chosen environmental and outcome variables, T-

tests were conducted, while Cohen’s d (Hinkle, Wiersma, & Jurs, 2002) was calculated to determine the effect size of significant findings.

Results

Means and standard deviations for each scale variable were examined, and are included in Table 2. In general, Agriculture students’ scores were higher on measures of involvement compared to the random sample, and were lower on outcome measures of leadership capacity and related competencies.

Table 2
Means and Standard Deviations for Scaled Input, Environmental, and Outcome Variables

Variable	Agriculture Students (n=461)		Comparison Group (n=461)	
	μ	SD	μ	SD
INPUTS				
HS involvement	11.54	3.61	11.44	3.50
HS leadership	2.85	1.22	2.76	1.19
SRLS Pre-test	3.87	0.55	3.91	0.50
ENVIRONMENT				
COL Involvement	3.41	1.41	3.13	1.47
COL Leadership	2.27	1.51	2.09	1.46
COL Lead Training	1.64	0.48	1.72	0.45
OUTCOMES				
SRLS	3.87	0.52	3.97	0.40
LSE	3.05	0.67	3.08	0.65
CC	2.98	0.52	3.10	0.59
SCB	2.45	0.70	2.51	0.78
SCD	2.81	0.81	3.04	0.76

To determine if statistically significant differences existed between the two samples with regard to gender, race, and political orientation, a chi-square analysis was conducted for each variable. Cramer's phi was calculated to determine the effect size of any significant differences ($p < .05$). A significant difference with a small effect was found with regard to gender ($\chi^2(2, N=922) = 7.85, p = .02, \phi = .09$). Significant differences with moderate effects were found for race ($\chi^2(25, N=922) = 48.91, p = .003, \phi = .23$), and political orientation ($\chi^2(4, N = 920) = 71.20, p < .0001, \phi = .28$). An interpretation of these results is that the sample of Agriculture students contained more male students, more Caucasian students, and more students who identified as "conservative" or "very conservative" than the random sample of college students used as a comparison. No significant differences were found with respect to SRLS Pre-test score, $t(920) = 0.83, p = .40$.

The degree to which students reported being involved in and leaders of high school organizations was analyzed using T-tests. Students across the two samples did not differ in the degree to which they were involved in high school student organizations, $t(920) = -.4, p = .67$; nor in the degree to which they reported occupying positions of leadership within these organizations, $t(920) = -1.20, p = .23$.

The Environmental variables examined in this study were students' reported involvement in and leadership of student organization, as well as the extent to which they participated in leadership training programs. T-tests were calculated, while Cohen's d was examined if significant differences were found ($p < .05$). Agriculture students reported being more involved in college organizations than their non-Agriculture peers, $t(919) = -2.94, p = .003$; with a small effect size ($d = .11$). Moreover, they held leadership positions within these organizations to a greater extent, $t(920) = 2.76, p = .006$, with a small effect size ($d = .09$). However, agriculture students participated in leadership training events at marginally the same rate as their peers, $t(920) = -1.82, p = .07$.

Outcome variables for this study were leadership capacity measured through SRLS score, leadership self-efficacy (LSE score), and scores from measures of cognitive complexity, social change behaviors, and socio-cultural discussion participation. T-tests were conducted, while Cohen's d was calculated if significant differences were found. Agriculture students' SRLS scores of leadership capacity were lower, $t(920) = 3.07, p = .002$; with a small-to-moderate effect size ($d = .19$). Agriculture students did not differ from the comparison sample with regard to LSE score, $t(920) = 0.89,$

$p = .23$; nor did they differ on a measure of social change behaviors, $t(918) = 1.07$, $p = .28$. However, significant differences were found in measures of cognitive complexity, $t(920) = 2.89$, $p = .004$; and socio-cultural discussions, $t(920) = 4.57$, $p < .0001$. Small-to-moderate effect sizes

were observed with regard to cognitive complexity ($d = .18$) while moderate effects were seen in socio-cultural discussion scores ($d = 0.29$). A summary of findings can be found in Table 3.

Table 3

Summary of findings: A Comparison of Agricultural Students with Comparison Group

Variable	p Value	Effect Size
Gender	.02	.09
Race	.003	.23
Political orientation	< .0001	.28
High school involvement	.67	
High school leadership	.23	
College involvement	.003	.11
College leadership	.006	.09
College leadership training	.07	
SRLS pre-test	.40	
SRLS score	.002	.19
LSE score	.23	
Cognitive complexity	.004	.18
Social change behaviors	.28	
Socio-cultural discussions	< .0001	.29

Note: significant differences ($p < .05$) in **bold**

Discussion

The results revealed that the group of students who reported “Agriculture” as their primary major included slightly more males, was moderately less racially diverse, and reported as moderately more politically conservative than a comparison group of students from the same institutions. Agriculture students and their comparison peers were involved in and led student organizations to similar degrees while in high school. While in college, agriculture students reported slightly higher degrees of involvement with college organizations, and held slightly more leadership positions within them, than the comparison group. However, they did not participate in leadership training events on campus to a greater degree. Perhaps most noteworthy for a study of student leadership outcomes, agriculture students displayed moderately lower levels of leadership capacities in college – while not significantly differing on a “recollection pre-test” of the same capacities in high school. In addition, agriculture students scored moderately lower on

a measure of cognitive complexity and engaged moderately less in socio-cultural discussions with peers when compared to the randomized group of students. The largest differences, measured by effect size, between the two groups were students’ political orientation and the degree of engagement in socio-cultural discussions with peers. No differences were found between the groups on measures of leadership self-efficacy and the degree to which students engaged in social-change behaviors such as political activism or community organizing.

Several studies in the past have shown the positive effects of involvement in student organizations on a variety of outcomes, including leadership development (Astin, 1999; Foubert & Grainger, 2006; Kuh, 1995). These findings suggest that involvement in these organizations may be more nuanced than originally considered, given that agriculture students displayed higher degrees of involvement and less leadership capacity.

Recent prior studies of student leadership capacity have shown that the degree to which

students engage in socio-cultural discussions with peers – that is, how often they discuss issues of personal and social importance or issues in which they differ from others – is an important predictor of the types of post-industrial leadership capacities relevant for professional success in the Twenty-first Century (Dugan & Komives, 2007, 2010). The results of this study show that students primarily situated within the field of agriculture engaged in these discussions less often than their peers, and that the extent of the gap may be potentially large. In addition, agriculture students displayed a small-to-moderate difference in scoring lower on a test of self-perceived cognitive complexity – that is, the degree to which they reported feeling effective in connecting divergent information and engaging in areas in which they knew little but would like to learn more.

Implications

These findings suggest that the act of engaging with peers in an organization, when controlling for other personal and environmental factors, may not be as significant a predictor of leadership development as previously thought. The degree to which students authentically engage with their peers and connect with them around discussions of personal significance may serve as the significant predictor when studying factors within student involvement that lead to increased leadership capacity. As the results are based on a nationally representative sample of students, the findings in this study have important implications for agricultural classroom instructors and advisors of individual students and agriculture-based student organizations.

Those who serve as course instructors might increase both student cognitive complexity and leadership capacity by incorporating important social issues into their classrooms and curriculum, while allowing, expecting, and encouraging dissenting viewpoints from students who engage in the discussion. While these findings suggest that agriculture students may be more homogenous than a random sample, this does not imply strict homogeneity. For example, 22% of agriculture students self-report as “liberal” or “very liberal.” Allowing for

differing perspectives and dissenting viewpoints may yield critical discussion that builds cognitive growth and leadership development opportunities in agriculture-oriented classrooms.

In the same way, advisors to students might provide more encouragement or opportunity for deep and meaningful dialogue amongst peers. Both authors have served in advisory roles to student organizations in the past, and know the pressure that students may feel at times to “get through the agenda.” Such meetings may provide a satisfactory level of task productivity yet not build the type of social atmosphere necessary for authentic engagement in a peer setting (Levi, 2011). Moreover, it may leave students without the opportunity to practice the skills they will need to collaborate with or supervise diverse others in less-structured environments.

Suggestions for Future Research

While recent studies have shown the correlation between socio-cultural discussion and leadership capacity (Dugan & Komives, 2007; Dugan & Komives, 2010), more research must be conducted to examine the relationship between these two constructs, especially in an agriculture-oriented context like Collegiate FFA organizations. For example, how might the participation in socio-cultural discussions lead a student to report higher levels of leadership capacity while not resulting in an increased score for leadership self-efficacy? In what ways does participation in these discussions lead to the ability to collaborate more effectively, or possess a greater capacity to lead a group within the context of a larger organization? Anecdotal evidence may exist, but so far little research has been conducted examining this relationship. In addition, the second-largest difference between the two groups was found in political orientation. More research could be conducted examining the potential mediating or moderating role that political orientation may play in engaging in socio-cultural discussions. Again, anecdotal evidence may exist, but no rigorous research has been conducting examining the two constructs.

Another line of potential research regards the study of agriculturally-based student

organizations. Many of these organizations are some of the oldest organizations on the college campus and exist on the high school level as well. They have been studied extensively in the past with regard to their effect on student leadership development (Anderson, Bruce, & Mouton, 2012; Ball, Garton, & Dyer, 2001; Connors & Swan, 2006; Hastings, Barrett, Barbuto, & Bell, 2011; Park & Dyer, 2010). However, surprisingly little research has been conducted with regard to students' experiences in collegiate agricultural organizations (i.e. CFFA, 4-H, PAS, etc.) or the discipline-based organizations popular in many colleges of agriculture. What themes exist regarding their organizational structures, especially as they may differ from other non-agricultural organizations? How do students interact, set strategic priorities, accomplish goals, and select peers for leadership positions within them, especially compared to other student organizations not affiliated with the field of agriculture?

Another potential direction for research is the degree to which socio-cultural discussion matters to the development of students relates to the internationalization of the agricultural curriculum. Internationalization has been a strong area of emphasis in the past in agricultural education and continues to be a priority area for colleges of agriculture across the nation. *The National Strategic Plan and Action Agenda for Agricultural Education* outlines a vision where, "all people value and understand the vital role of agriculture, food, fiber and natural resources systems in advancing personal and global well-being," with the mission of agricultural education reflecting the preparation of students for that vision (National Council for Agricultural Education, 2000, p. 3). The National Academies (2009) includes this area among their steps for enabling education programs to meet industry expectations, recommending "institutions should increase students' exposure to international perspectives by supporting targeted learning-abroad programs and by incorporating international perspectives into existing courses" (p.2). Additional research is needed to determine if such experiences and cultural awareness at secondary and post-secondary levels may enhance the leadership

capacity of agricultural students to engage in socio-cultural discussions.

Finally, the use of mutually beneficial community organization partnerships should be explored for various colleges of agriculture courses. Strategic partnerships offer students professional experience while making a stronger connection point for community organizations and corporations to communicate needs and expectations for future employees (The National Academies, 2009). Such relationships could offer students the opportunity develop deeper levels of cognitive complexity by promoting agricultural awareness while engaging in rich, socio-cultural experiences with reflection and discussion elements incorporated into the course work.

Conclusion

This study highlighted that agricultural students maintain a strong level of involvement in leadership development throughout their high school and collegiate experience; however, such involvement may not necessarily lead to growth in leadership capacity in comparison to non-agricultural students. These findings may be related to deficits seen in agriculture students' self-reported cognitive capacity and participation in socio-cultural discussions. Our results of this study imply that agricultural educators may benefit their students in providing and designing opportunities for leadership development that include experiences with socio-cultural contexts and reflection. This is reflective of Freeman and Goldin's (2008) findings that leadership programs with intentional design offer students practical experiences to better their leadership capacities for current and future application.

It is clear that change is needed in higher education programs to reflect the expectations of the agricultural industry and growing interdisciplinary collaborations in our global society. The National Academies (2009) emphasizes, "If institutions of higher learning do not address the changes needed, they risk becoming irrelevant. Without significant action, graduates of these programs will have difficulty keeping up with the changing needs of society and building stable careers, and the nation will

miss its opportunity for leadership in addressing the global challenges related to food and agriculture” (p. 2). Although involvement in leadership development at the secondary level may indicate active student involvement in collegiate organizations and in future pro-

fessional opportunities (Allen, Ricketts, & Priest, 2007), further emphasis is needed in leadership development within agricultural classrooms for the agricultural industry to have sustainable leadership for years to come.

References

- Allen, J., Ricketts, J.C., & Priest, K. (2007). Contributions of pre-collegiate and collegiate leadership experiences to alumni leadership development. *NACTA Journal*, September, 56-61.
- Anderson, J., Bruce, J., & Mouton, L. (2010). 4-H made me a leader: A college-level alumni perspective of leadership life skill development. *Journal of Leadership Education*, 9(2), 35-49.
- Astin, A. W. (1993). *What Matters in College?* San Francisco: Jossey-Bass.
- Astin, A. W. (1999). Involvement in learning revisited: Lessons we have learned. *Journal of College Student Development*, 40(5), 587-598.
- Astin, H. S. (1996). Leadership for social change. *About Campus*, 1(3), 4-10.
- Astin, A. W. & Astin, H. S. (2000). *Leadership reconsidered: Engaging higher education in social change*. Battle Creek, MI: W. K. Kellogg Foundation.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211
- Ball, A. L., Garton, B. L., & Dyer, J. E. (2001). The influence of learning communities and 4-H/FFA participation on college agriculture students' academic performance and retention. *Journal of Agricultural Education*, 42(4). doi: 10.5032/jae.2001.04054
- Bandura, A. (1997). *Self-Efficacy: The exercise of control*. New York: W.H. Freeman and Company.
- Birkenholz, R.J. & Schumacher, L.G. (1994). Leadership skills of college of agriculture graduates. *Journal of Agricultural Education*, 35(4), 1-8. doi:10.5032/jae.1994.04001
- Brungardt, C. (1996). The making of leaders: A Review of the research in leadership development and education. *The Journal of Leadership Studies*. 3(3), 81-93.
- Connors, J.J. & Swan, B.G. (2006). A synthesis of leadership development research in agricultural education:1988-2003. *Journal of Agricultural Education*, 47(2), 1-13.
- Connors, J.J., Velez, J.J., & Swan, B.G. (2006). Leadership characteristics of outstanding `seniors in a land-grant university college of agriculture. *Journal of Leadership Education*, 5(3), 93-109.
- Doerfert, D.L. (2011). *National research agenda: American Association for Agricultural Education's research priority areas for 2011-2015*. Lubbock, TX: Texas Tech University, Department of Agricultural Education and Communications.
- Dugan, J.P. & Komives, S.R. (2007). *Developing leadership capacity in college students: Findings from a national study. A Report from the Multi-Institutional Study of Leadership*. College Park, MD: National Clearinghouse for Leadership Programs.
- Dugan, J. P. & S. R. Komives (2010). Influences on college students' capacities for socially responsible leadership. *Journal of College Student Development*, 51(5): 525-549.
- Ellis, P. D. (2010). *The essential guide to effect sizes: Statistical power, meta-analysis, and the interpretation of research results*. New York: Cambridge University Press.

- Engbers, T.A. (2006). Leadership programming model revisited. *Journal of Leadership Education*, 5(3), 1-14.
- Ewing, J.C., Bruce, J.A., & Ricketts, K.G. (2009). Effective leadership development for undergraduates: How important is active participation in collegiate organizations? *Journal of Leadership Education*, 7(3), 118-132.
- Faris, S. K., & Outcalt, C., L. (2001). The emergence of inclusive, process-oriented leadership. In C. L. Outcalt (Ed.). *Developing non-hierarchical leadership on campus: Case studies and best practices in higher education*. Westport, CT: Greenwood Press.
- Foubert, J. D., & Grainger, L. U. (2006). Effects of involvement in clubs and organizations on the psychosocial development of first-year and senior college students. *NASPA Journal*, 43(1), 166-182.
- Freeman, J.P. & Goldin, A. (2008). The increasing importance of student leadership development programs in higher education. *NASPA Net Results*, February 27, 2008.
- Friedman, T. L. (2007). *The world is flat 3.0: A brief history of the twenty-first century*. New York, NY: Picador.
- Gonyea, R. M. (2005). Self-reported data in institutional research: Review and recommendations. *New Directions for Institutional Research*, 127, 73-89.
- Hastings, L.J., Barrett, L.A., Barbuto, J.E., & Bell, L.C. (2011). Developing a paradigm model of youth leadership development and community engagement: A grounded theory. *Journal of Agricultural Education*, 52(1), 19-29. doi: 10.5032/jae.2011.01019
- Higher Education Research Institute. (1996). *A social change model of leadership development (Version III)*. Los Angeles: University of California Higher Education Research Institute.
- Hinkle, D. E., Wiersma, W., & Jurs, S. G. (2002). *Applied statistics for the behavioral sciences (5th ed.)*. Boston: Houghton Mifflin.
- Inkelas, K. K. (2004). Does participation in ethnic cocurricular activities facilitate a sense of ethnic awareness and understanding? A study of asian pacific american undergraduates. *Journal of College Student Development*, 45(3), 285-302.
- Inkelas, K. K., Vogt, K. E., Longersbeam, S. D., Owen, J., & Johnson, D. (2006). Measuring outcomes of living-learning programs: Examining college environments and student learning and development. *The Journal of General Education*, 55(1), 40-76.
- Kezar, A. J., Carducci, R., & Contreras-McGavin, M. (2006). *Rethinking the "L" Word in Higher Education: The Revolution in Research in Higher Education*. San Francisco: Jossey-Bass.
- Komives, S. R., Lucas, N., & McMahon, T. (2007). *Exploring Leadership: For College Students Who Want to Make a Difference (2nd Ed.)* San Francisco: Jossey-Bass.
- Komives, S. R., & Wagner, W. (2009). *Leadership for a better world: Understanding the social change model of leadership development*. San Francisco: Jossey-Bass.
- Kouzes, J. M., & Posner, B. Z. (2010). *The truth about leadership: The no-fads, heart-of-the-matter facts you need to know*. San Francisco: Jossey-Bass.
- Kuh, G. D. (1995). The other curriculum: Out of class experiences associated with student learning. *Journal of Higher Education*, 66(2), 123-155.
- Levi, D. (2011). *Group Dynamics for Teams (3rd ed.)*. Thousand Oaks, CA: Sage Publications.

- Marcketti, S.B. & Kadolph, S.J. (2010). Empowering student leadership beliefs: An exploratory study. *International Journal of Teaching and Learning in Higher Education*, 22(2), 131-139.
- Miles, J., & Shevlin, M. (2004). *Applying Regression and Correlation: A Guide for Students and Researchers*. London: Sage Publications.
- National Association of Colleges and Employers. (2011) *Job Outlook 2012*. Retrieved February 29, 2012, from the University of Northern Colorado. (<http://www.unco.edu/careers/family/pdf/NACEJobOutlookNov2011.pdf>).
- The National Academies. (2009). *Transforming Agricultural Education for a Changing World Report in Brief*. Retrieved February 5, 2012, from the National Academies Press at http://dels-old.nas.edu/ag_education/.
- National Council for Agricultural Education (2000). *The national strategic plan and action agenda for agricultural education: Reinventing agricultural education for the year 2020*.
- Park, T. D., & Dyer, J. E. (2005). Contributions of agricultural education, FFA, and 4-H to student leadership in agricultural colleges. *Journal of Agricultural Education*, 46(2), 83-95. doi: 10.5032/jae.2005.02083
- Powell, D. & Agnew, D.M. (2007). Student leader preferences: What students want from involvement in student organizations. *NACTA Journal*, June, 11-18.
- Ricketts, K. G., Bruce, J. A., & Ewing, J. C. (2008). How today's undergraduate students see themselves as tomorrow's socially responsible leaders. *Journal Leadership Education*, 7(1), 24-42.
- Riggio, R. E., Ciulla, J. B., & Sorensen, G. J. (2003). Leadership education at the undergraduate level: A liberal arts approach to leadership development. In S. E. Murphy & R. E. Riggio (Eds.), *The Future of Leadership Development* (pp. 223-236). Mahwah, NJ: Erlbaum.
- Rost, J. C. (1993). *Leadership for the 21st Century*. Westport, CT.: Praeger Publishers.
- Seidman, D. (2007). *How we do anything means everything: In business and in life*. Hoboken, NJ: John Wiley & Sons.
- Schumacher, L.G. & Swan, M.K. (1993). Need for formal leadership training for students in a land-grant college of agriculture. *Journal of Agricultural Education*, 34(3), 1-9.
- Shertzer, J.E. & Schuh, J.H. (2004). College student perceptions of leadership: Empowering and constraining beliefs. *NASPA Journal*, 42(1), 111-131.
- Simonsen, J.C. & Birkenholz, R.J. (2010). Leadership courses required in agricultural teacher education programs. *Journal of Agricultural Education*, 51(3), 114-124. doi: 10.5032/jae.2010.03114
- Slack, C. (2006). *Socially responsible leadership scale revised version 2: Using the SRLS-R2 for research and assessment* C. Slack (Ed.) College Park, MD: National Clearinghouse for Leadership Programs.
- Trochim, William M. (2006). *The Research Methods Knowledge Base, 2nd Edition*. <http://www.socialresearchmethods.net/kb/> (version current as of October 20, 2006).
- Zimmerman-Oster, K. & Burkhardt, J.C. (1999). Leadership in the making: A comprehensive examination of the impact of leadership development programs on students. *The Journal of Leadership studies*, 6(3/4), 50-66.

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