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NCLCA

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Letter from the Editor

It's two days before my fiftieth birthday, and I'm feeling a lull in my creativity.

For over twenty years, I wrote every day, sometimes writing as much as six hours, but most of the time, I wrote for two-and-a-half hours because work – and life – got in the way. I wrote without stopping, often ignoring my need for sleep, food, human interaction, and the call of nature. I thought about writing much the way an athlete or gym devotee might think about working out. I got up early, showered, ate, and headed into work or sat at my home office keyboard and wrote. At first, I was writing because the job demanded it (I was doing stand-up comedy back then), then for pleasure and to strengthen my skills, and then for my MFA program, only to come full circle and write for work once again (the university is a harsh mistress). I saved whatever I produced, affixing a date to it and dropping it into folders labeled, “Crap,” “Dear God,” “What Was I Thinking,” “Maybe This,” or perhaps simply “Miscellaneous.”

Those folder titles hold meaning to me, but I'll keep those meanings to myself because it ruins the joke when you have to explain it (I didn't say I was good at stand-up, now did I?)

When the fall semester closed in the middle of December, I logged out of my computer, turned off the lights in my office, and went home. In the past, I wrote every day, even during breaks from work and while on vacation. Not this time. I was three days in before I realized that I hadn't opened my laptop, checked my email or messages, or even called my family or friends. I ignored the impulse to rectify my oversight. By the end of week one, there were days when I only wore a tracksuit or pajamas, failed to comb my hair even after I showered, and spoke to only my wife and our cat. I watched Netflix and *Star Trek: Discovery* until my bones ached from sitting too long. I considered watching *The Hobbit* trilogy on Blu Ray, but their running time meant I'd have to plan when I'd watch them, and I didn't want to plan twelve hours of anything.

It was two weeks into my exile from writing words before I reached out to my publishers to tell them that I was taking a break because I think I broke my brain. My publisher with TidalWave Comics, the always genial Darren Davis, said, “I hear you. I’m taking a break, too. I’m tired. Don’t worry. We don’t have anything pressing.” Casey Cowan said, “I feel your pain. I’m in the same boat.” As the Chief Executive Officer of Oghma Creative Media, the home of my graphic novel and where I have contracts for an original novel, a sequel to a Harold Robbins novel, and am writing the introductions for the re-releases of Robbins’ novels, Casey was always thinking of the next project. Both men are workaholics who care about the craft and their brands. Both never seemed to tire. I checked into social media, only to discover other writers and artists I knew were lamenting their lack of progress on various projects, too.

All the creatives I knew were on a mental hiatus or suffering some form of creative vacation. I didn’t feel alone in my aversion to creating the art I loved anymore, despite looking like Howard Hughes.

During the month-long break, my hair grew in direct proportion to my waistline. My normally short-cropped hair stuck out like I’d suffered through a tornado and my jeans (on the rare occasion I put on pants) felt snug. Not snug in that I just washed and dried them, and they may have shrunk a little way; rather, they gripped me in places I’d worked hard to diminish through diet and exercise. My wife, Julia, is an excellent cook. She teaches at a private high school, so she was on break, too. It was nice to get to know her again instead of sitting at a desk gazing at a blinking cursor. We ate whatever she baked in the oven or brewed in a Crock Pot and left classrooms, students, and other people behind us. It was glorious.

And then it was time to come back to work.

I had to train my student staff, plan two classes, and wade through my neglected email inbox. It took almost three full days to answer emails and another day to order food, create an agenda for training, and return missed phone calls. I was forced to be social during meetings, creative while updating websites, and witty while presenting introductory material or study skills workshops. But I still wasn’t writing. I wasn’t *creating*. It took an email from Meghan Smith,

The *Learning Assistance Review*'s brilliant layout designer, to spur me to craft this "Letter from the Editor."

Hoping to find inspiration, I decided to re-read each article accepted for this issue. In these pages, you'll find the well-researched work of Adrian James, Lori Moore, Jack Trammell, Joana Kourtidis, Greta Winograd, Jay Verkuilen, Alison Weingarten, Lucy Walker, Neva Lozada, Ane Turner Johnson, Kirk A. Skogland, Timothy J. Wall, and David Kiene. Reading them again, I felt something stir in me. These dedicated professionals put aside their lives for a little while and created something meaningful. They squeezed writing time between family and work requirements, researched in the early hours of the morning or while their significant others watched *This Is Us*. It all started the same. They filled a blank, white page.

At first, I was dismissing my sabbatical from the screen as a passing thing, rationalizing it. I told myself that I deserved a break. I've produced a lot of stuff in the past few years, and a few days rest would do me good. After a week, I wondered if my advancing age was slowing me down. A month in, I started to believe that the weight of five decades of life was suddenly crushing my youthful creativity.

But writing is never easy. It shouldn't be. If it were, everyone would do it. In the age where easy access to a keyboard can make everyone a writer, few can call themselves authors. It's time for me to stop wallowing and find my way back to the art. Like the brilliant published authors featured in this volume, it's time for me to create.

This letter is a start. Let's see where it goes from here.

Sincerely,

Michael Frizell
January 22, 2018

Understanding the Supplemental Instruction Leader

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Abstract

This article explored the learning styles and leadership styles of Supplemental Instruction (SI) leaders at Texas A&M University, and the impact of those preferences on recurring attendance to their sessions. The Learning Style Inventory, the Multifactor Leadership Questionnaire, and a demographic instrument were administered to SI leaders employed in the fall 2013 semester. This study is of significance to practitioners and researchers by identifying characteristics of SI leaders, one of the key personnel of a higher education learning program.

Keywords: supplemental instruction leader, learning style, experiential learning theory, leadership style, transformational leadership.

In an effort to support the learning needs of students in higher education, institutions have implemented academic support programs (Martin & Arendale, 1993). One successful program being implemented in colleges and universities across the globe is Supplemental Instruction (SI) (Martin & Arendale, 1993). One of the elements central to the success of the SI program lies in the leadership of currently enrolled students, known as SI leaders, to facilitate group study sessions for courses that have been identified as high risk (Arendale, 1994).

Despite the fact that SI leaders are key to the success of the SI program, few researchers have explored their characteristics (Arendale, 1997). One characteristic that warrants further investigation is the learning style of the SI leader. Even though

SI sessions follow a set of guidelines provided by the program, session design and implementation can differ by individual SI leader. Adams (2011) found that SI session designs exhibited characteristics of the SI leader's learning style identified by D. A. Kolb's (1984) Learning Style Inventory (LSI). This is supported by the assertion that instructors teach based on their own learning style preferences (Hawk & Shah, 2007; Marshall, 1991; Wolfe, Bates, Manikowske, & Amundsen, 2005). The LSI identifies learning styles suggested by D. A. Kolb's (1984) experiential learning theory (ELT). As with SI, ELT proposes a framework for learner-centered education with foundations in constructivism (Kolb, & Kolb, 2005).

The leadership style of the SI leader should not be overlooked. The title alone suggests that further investigation of behavior preferences for approaching the leadership of group study sessions is necessary. The SI model asserts that SI leaders are supposed to create a collaborative learning environment in which student attendees feel bonded by a common purpose and motivated to learn (Martin, Arendale & Associates, 1992; McGuire, 2006). As Northouse (2007) asserted, this ability to motivate and create a common bond and purpose is encompassing of a transformational leader. Thus, the argument can be made that SI leaders are, or at least should be, transformational leaders.

Additional responsibilities of the SI leader also appear to overlap with transformational leadership behaviors identified by Bass (1988), a well-known scholar of transformational leadership. However, empirical research about the leadership of SI leaders is generally limited to the skills that they gain in the role (Congos & Stout, 2003; Etter, Burmeister, & Elder, 2000; Lockie & Van Lanen, 2008; Stout & McDaniel, 2006; Zaritsky & Toce, 2006). This study explores the leadership behaviors of SI leaders to determine if there is, in fact, an overlap with their responsibilities and transformational leadership behaviors.

Literature Review

The SI Leader

SI is an academic support program developed in 1973 by Deanna Martin at the University of Missouri, Kansas City (Arendale,

1997). The program is implemented in higher education institutions and utilizes currently enrolled students, called SI leaders, to facilitate group study sessions for select, high-risk, courses. The creation of the program was an effort to improve on traditional one-on-one peer tutoring, which labels students as at high risk (Martin & Arendale, 1993). Instead of labeling the student, the SI program identifies and targets high-risk courses (Blanc, DeBuhr, & Martin, 1983; Martin et al., 1992), that is, entry-level courses in which at least 30% of the students commonly receive a grade of D or F or withdraw from the course (Blanc et al., 1983).

Once a course has been identified as high risk, a student, known as the SI leader, is assigned to the course. To be hired as an SI leader, a student must meet the following minimum requirements: (a) at least a 3.0 grade point average (GPA) on a 4.0 scale, (b) demonstrated interpersonal communication skills, (c) a recorded A or B in the targeted course, and (d) availability to attend training (Peer Academic Services, 2014). In addition, the SI leader must be available to attend the class lectures of the targeted class, take notes, and do the homework and readings (Congos, 1998). Doing so allows the leader to be aware of what concepts were presented in class and how those concepts were presented, which is useful in planning sessions (Etter et al., 2000). This requirement also allows the leader to interact with the students in the course and to encourage them to attend SI sessions (Hurley, Jacobs, & Gilbert, 2006).

The SI leader facilitates group study sessions to help students to learn and apply effective study strategies to achieve the higher levels of learning that are required at the collegiate level (Hurley et al., 2006). The group study sessions are open to all students who are enrolled in the course, and attendance is voluntary (Arendale, 1994; Blanc et al., 1983). SI sessions are held three or four times a week, each lasting 50 minutes (Blanc et al., 1983). During the sessions, the SI leader helps participants to learn effective strategies to succeed in the course (Blanc et al., 1983; Hurley et al., 2006).

Substantial research spanning various course subjects has shown that students who attended at least one SI session had higher course performance than those who did not attend (Arendale, 1997; Blanc et al., 1983; Blanc & Martin, 1994; Congos & Schoeps, 1993;

Hensen & Shelley, 2003; Kochenour, Jolley, Kaup, Patrick, Roach & Wenzler, 1997). Further, there is evidence that attending SI sessions on a regular basis has a greater impact on course performance (Arendale, 1997; Kochenour et al., 1997; McGuire, 2006). Data reported by Peer Academic Services (PAS) at Texas A&M University spanning 10 semesters support this claim (PAS, 2006-2011).

Even with an awareness of its demonstrated effectiveness and ongoing marketing strategies, many students choose not to attend SI sessions (McGuire, 2006). To understand this, researchers have investigated characteristics of students who attend SI sessions (McGee, 2005; Visor, Johnson & Cole, 1992; Warren, 1997). However, research on the impact of the SI leader is limited.

The SI leader is one of the three key personnel of the SI program (Martin et al., 1992). The SI leader is a currently enrolled college student who has excelled in the identified high-risk course (Martin & Arendale, 1994). Before being allowed to facilitate a group study session, the SI leader must attend training provided by the program's supervisor, who is also one of the key personnel for SI (Hurley et al., 2006). During this training, the SI leader is given information on learning strategies, facilitation methods, and techniques to engage students with each other and with the material (Martin et al., 1992).

Learning Styles

As a result of hereditary factors, past experiences, and present environment, people develop preferences about how they prefer to grasp and transform knowledge (Kolb, D. A., 1981, 1984), known as learning styles. D. A. Kolb (1984) identified four learning styles based on his Experiential Learning Theory (ELT): converging, diverging, assimilating, and accommodating. The four styles are identified by assessing a person's preference for modes in the experiential learning cycle (Kolb & Kolb, 2005).

People with a converging learning style have strong problem-solving and decision-making abilities. In formal learning situations, they prefer experimenting with new ideas (Kolb & Kolb, 2005; Kolb, D. A., 1984). People with a diverging style excel at brainstorming and creating new ideas and implications. They prefer to work in groups to gather information and they desire individualized feedback (Kolb & Kolb, 2005; Kolb, D. A., 1984).

People with an assimilating style have strengths that lie in taking a wide range of information and putting it into logical form. In formal learning situations, they prefer readings and lectures and having time to think things through (Kolb & Kolb, 2005; Kolb, D. A., 1984). People with an accommodating learning style have strengths in completing tasks and getting involved in new and challenging experiences. They prefer learning situations in which they can set goals, work with others, and test various approaches to task completion (Kolb & Kolb, 2005; Kolb, D. A., 1984).

To help people to understand their unique approach to the process of learning from experience, D. A. Kolb developed the Learning Style Inventory (LSI) (Kolb & Kolb, 2005) which identifies a preference for one of the four styles. Administration of the instrument has allowed for exploration of demographics. Gender and its relationship to learning is perhaps the most reported demographic characteristic in research using the LSI.

There are studies that support differences in learning styles between males and females. In a study by Philbin, Meier, Huffman, and Boverie (1995) of 45 females and 25 males, a significant difference was found in learning style preferences using the LSI 2. It was reported that the assimilator style was most preferred by males and least preferred by females. Peters (2012) also reported a significant difference between male and female students. In Peters' (2012) study using the LSI 3.1, the difference was found in the accommodating style consisting of 70% females and 30% males.

While there is research to support significant learning style differences by gender, other studies have failed to document significant differences. Demirbas and Demirkan (2007) did not find a significant difference in learning styles in a 3-year sample of 140 female and 133 male freshmen students in an architecture and design department. Similarly, Healey, Kneale, and Bradbeer (2005) did not find a significant difference in learning styles by gender in a study of more than 900 students.

Adams (2011) investigated the relationship between the SI leader learning styles and SI session design. Overall, however, there is a paucity of research related to specific characteristics of SI leaders, including learning styles.

Leadership Styles

Leadership is a complex concept that has been conceptualized, described, and defined in many ways. One definition, which encompasses concepts central to this study is that “leadership is a process whereby an individual influences a group of individuals to achieve a common goal” (Northouse, 2007, p. 3). This process is an interactive event between the leader and the follower(s) and can be approached in various ways (Northouse, 2007). In early years, Burns (1978) asserted that this interaction takes two independent forms: transactional leadership and transforming leadership. Transactional leadership was said to have occurred when there was an exchange of valued things without a purpose that connected the leader and follower (Burns, 1978). In contrast, Burns (1978) said that transforming leadership occurred when people engaged with each other in such a way that they were bound together and higher levels of motivation were achieved.

Expanding on Burns’ work, Bass (1985) proposed that transformational and transactional leadership occurred along a continuum and were not independent of each other. He identified the two as conceptually distinct but asserted that behaviors associated with them could be displayed by the same person, just in different intensities (Bass, 1985). This full range of leadership model was developed to explain leadership behaviors. The model identifies factors that help to identify transformational leadership, transactional leadership, and passive/avoidant leadership (Avolio & Bass, 2004).

Passive/avoidant leadership is essentially the lack of leadership and involves two factors: management-by-exception (passive), and laissez-faire leadership. Leaders displaying management-by-exception (passive) behaviors wait for problems to arise before taking corrective action in the form of job loss, reprimands, or information regarding what needs to be corrected. Laissez-faire leadership is demonstrated when decisions are avoided, the leader is absent when needed, and there is a delay responding to important issues (Avolio & Bass, 2004).

A transactional approach to leadership involves exchanges between the leader and group members. In interactions with followers, a transactional leader exchanges rewards for effort and is more concerned with processes than with ideas (Bass, 1985). Two factors are associated with transactional leadership: contingent reward

and management-by-exception (active; Avolio & Bass, 2004).

Contingent reward is a constructive transaction and is demonstrated when a leader rewards a member for his or her effort. The outline of task or goal is agreed on in advance and rewards are given only if the agreement is met. Management-by-exception (active) is a corrective transaction and is displayed when a leader intervenes to give negative reinforcement or corrective criticism. Active management-by-exception is demonstrated when a leader proactively seeks to identify mistakes made by members (Avolio & Bass, 2004).

The third approach, transformational leadership, is said to be the most effective approach to leadership (Avolio & Bass, 2004). A meta-analysis by Lowe, Kroeck, and Sivasubramaniam (1996) revealed stronger associations between transformational leadership and unit effectiveness than between transactional leadership and unit effectiveness. The full range of leadership model identifies five factors inclusive of transformational leadership: idealized influence (attributed), idealized influence (behavior), inspirational motivation, intellectual stimulation, and individualized consideration.

A transformational leader who possesses idealized influence has followers who idealize the leader and want to emulate the leader. Inspirational motivation is demonstrated by leaders when they provide a clear understanding of shared goals. The leaders' expectations are typically high; however, they provide visions of what is possible and promote the importance of their role within the team (Avolio & Bass, 2004; Northouse, 2007).

A leader who utilizes intellectual stimulation encourages members to think of problems in new and creative ways and even question assumptions of the leader if appropriate. (Avolio & Bass, 2004; Northouse, 2007). Individualized consideration is displayed when each individual is treated uniquely, and the leader strives to create a climate that supports individual growth (Avolio & Bass, 2004; Northouse, 2007).

In an effort to measure and identify transformational, transactional, and passive/avoidant styles quantitatively, Bass (1985) proposed a six-factor model of the Multifactor Leadership Questionnaire (MLQ; Avolio & Bass, 2004). The MLQ has undergone revision and refinement since 1985 (Avolio & Bass,

2004). The instrument has been used in numerous studies across the globe and is the most widely used measurement of transformational leadership (Avolio & Bass, 2004; Northouse, 2007).

Through measurement of transformational, transactional, and passive/ avoidant leadership, relationships between gender and leadership have emerged. As with learning style, results from the studies reveal both significant relationships and lack of relationships.

One variable that has received a great deal of attention in research conducted on leadership style is gender. Results indicating and denying gender as a correlate to leadership styles have been reported. These differences exist in both the self-rating of leadership behavior and ratings by followers or subordinates. In a meta-analysis, Eagly, Johannesen-Schmidt, and van Engen (2003) found significant differences in transformational and transactional leadership behaviors of men and women. Females scored significantly higher than males on idealized influence (attributed), inspirational motivation, intellectual stimulation, and individualized consideration. Females also scored higher on contingent reward. Males scored significantly higher on management-by-exception (passive and active) attributes and the laissez-faire style.

In a study of 74 hall directors employed at one of seven public universities, Komives (1991) found that men and women were similar in their leadership styles as measured by the MLQ self-rater form on all but one subscale: intellectual stimulation. Men scored significantly higher than women on this subscale.

In a study of 47 cooperative extension service leaders, Moore (2003) reported that females had a higher mean score than males for the three leadership styles and eight of the nine leadership scales identified by the MLQ. Management-by-exception (active) was the only scale on which males scored higher than females. However, the only scale with significant difference by gender was idealized influence (attributed).

A key element to the effectiveness of the SI program is the SI leader. This student leads group study sessions that engage attendees with the material and with each other. When exploring responsibilities of their role, comparisons can be made with ELT learning styles and transformational leadership behaviors.

Purpose

The purpose of this study was to explore the learning styles and leadership styles of SI leaders. In addition, the relationship between learning and leadership styles and recurring attendance to SI sessions was investigated. The study was designed to meet four specific objectives:

1. Explore the SI leader's learning style.
2. Explore the SI leader's leadership style.
3. Explore the relationship between SI leader learning styles and recurring attendance to SI.
4. Explore the relationship between SI leader leadership styles and recurring attendance to SI.

Methods

Participants

There were 40 SI leaders who agreed to participate in the study. The participants were undergraduate students employed as SI leaders by PAS at Texas A&M University in the fall 2013 semester. SI leaders were emailed links to the MLQ and LSI which included gender as a demographic. The director at PAS provided the researcher the attendance data for the courses associated with the respondent SI leaders.

Data Analysis

The response rate was 87.50% ($N = 35$) and the usable response rate was 85% ($N = 34$) for the LSI and 80% ($N = 32$) for the MLQ. Of the 34 participants, 64.71% ($n = 22$) were female and 35.29% ($n = 12$) were male.

Missing data were addressed for the MLQ but not needed for the LSI 3.1 or demographic instrument because all items were completed. If a participant failed to complete a statement on the MLQ, the mean score for the associated scale was calculated based on the items that were completed. This followed advice from staff at Mind Garden, Inc. (personal communication, February 10, 2014).

Objectives 1 and 2. The four learning styles: accommodating, diverging, assimilating, and converging and gender were reported for objective 1. The mean scores for the three leadership styles—transformational, transactional, and passive/avoidant—and the nine scale variables associated with those styles—idealized influence

(attributed), idealized influence (behavior), inspirational motivation, intellectual stimulation, individual consideration, contingent reward, management by exception (active), management by exception (passive), and laissez-faire—along with gender were reported for objective 2.

Objectives 3 and 4. For objectives 3 and 4, the dependent variable was attendance as researchers were exploring the impact of SI leader learning and leadership styles on recurring attendance to SI sessions. Because “absenteeism is a nonevent in that no behavior can be observed,” (Latham & Pursell, 1975, p. 369) only students who attended at least one SI session were included in data analysis.

Attendance was reported for the course to which the SI leader was assigned. This variable was computed by dividing the number of times a student attended SI session(s) by the number of SI sessions offered for that student’s course. This produced the percentage of SI sessions that a student attended. This was done to standardize the data because not all SI leaders held the same number of SI sessions. Next, an average of the percentages for the students attending the course was calculated.

The independent variables were the learning styles, leadership styles, and leadership scales. One-way analysis of variance was used to determine whether attendance differed by learning style. Pearson product-moment correlation was used to determine the relationship between attendance and learning styles, leadership styles, and leadership scales.

Results

Objective 1

The majority of participants in this study preferred a diverging or accommodating learning style. This is true of both males and females (Table 1). As shown in Table 1, 20.59% ($n = 7$) of the 34 participants were female accommodating learners and 5.88% ($n = 2$) were males. Diverging females accounted for 23.53% ($n = 8$) and diverging males also accounted for 23.53% ($n = 8$) of total participants. No males showed a preference for the assimilating learning style, and 14.71% ($n = 5$) of the females reported a preference for assimilating. Female converging learners accounted for

5.88% ($n = 2$) of the total participants; this was the same for male converging learners, 5.88% ($n = 2$).

Table 1

Frequencies of Learning Styles of Supplemental Instruction Leader by Gender (N = 34)

Learning Style	Female		Male		Total	
	<i>n</i>	% of total	<i>n</i>	% of total	<i>n</i>	% of total
Accommodating	7	20.59	2	5.88	9	26.47
Diverging	8	23.53	8	23.53	16	47.06
Assimilating	5	14.71	0	0.00	5	14.71
Converging	2	5.88	2	5.88	4	11.76
Total	22	64.71	12	35.29	34	100.00

Objective 2

There were 21 females and 11 males who provided usable responses on the MLQ. Females had a higher mean score for transformational leadership style ($M = 3.02$, $SD = 0.26$) and the scales idealized influence (attributed; $M = 3.01$, $SD = 0.53$) and individual consideration ($M = 3.27$, $SD = 0.43$). Males had a higher mean score for idealized influence (behavior; $M = 2.73$, $SD = 0.49$), inspirational motivation ($M = 3.30$, $SD = 0.44$), and intellectual stimulation ($M = 2.98$, $SD = 0.54$) scales of transformational leadership style. Male participants also had higher mean scores for transactional leadership style ($M = 2.58$, $SD = 0.49$) and its scales, as well as for passive/avoidant leadership style ($M = 0.79$, $SD = 0.56$) and its scales. Mean scores for the leadership styles and scales by gender are presented in Table 2.

Table 2

Mean Leadership Scale Scores and Leadership Style Scores by Gender (N = 32)

Construct	Gender	<i>n</i>	<i>M</i>	<i>SD</i>	<i>d</i>
Idealized Influence (Attributed)	Female	21	3.01	0.53	0.27
	Male	11	2.85	0.66	
Idealized Influence (Behavior)	Female	21	2.63	0.26	0.26
	Male	11	2.73	0.49	

Table 2 Continued					
Construct	Gender	<i>n</i>	<i>M</i>	<i>SD</i>	<i>d</i>
Inspirational Motivation	Female	21	3.25	0.47	0.11
	Male	11	3.30	0.44	
Intellectual Stimulation	Female	21	2.94	0.44	0.08
	Male	11	2.98	0.54	
Individual Consideration	Female	21	3.27	0.043	0.36
	Male	11	3.09	0.56	
Transformational Leadership Style	Female	21	3.02	0.26	0.09
	Male	11	2.99	0.39	
Contingent Reward	Female	21	2.93	0.51	0.17
	Male	11	3.01	0.43	
Management-by-Exception (Active)	Female	21	1.83	0.84	0.45
	Male	11	2.16	0.59	
Transactional Leadership Style	Female	21	2.38	0.55	0.38
	Male	11	2.58	0.49	
Management-by-Exception (Passive)	Female	21	0.58	0.45	0.44
	Male	11	0.80	0.54	
Laissez-Faire Leadership	Female	21	0.48	0.45	0.47
	Male	11	0.77	0.75	
Passive/Avoidant Leadership Style	Female	21	0.53	0.37	0.55
	Male	11	0.79	0.56	

Note: Scores range from 0 to 4. (0 = *not at all*, 1 = *once in a while*, 2 = *sometimes*, 3 = *fairly often*, 4 = *frequently, if not always*)

Objectives 3 and 4

Average recurring attendance ranged from 5.44% to 34.02% for individual SI leaders in this study. Learning style and leadership behaviors were not related to recurring attendance at SI sessions.

Discussion

These findings are encouraging, as the responsibilities of the SI leader that contribute to the success of SI can be seen to overlap transformational leadership behaviors. SI leaders are responsible for creating an environment in their sessions in which students gain skills to be successful, independent learners (Hurley et al., 2006). They incorporate strategies to help attendees with how to learn (Arendale, 1997). This can be seen to interrelate with the intellectual stimulation

scale. Bass (1988) claimed that an intellectually stimulating leader contributes to followers' independence by teaching them how to fish rather than giving them fish. The mean score for intellectual stimulation was 2.95 ($SD = 0.47$), indicating that these SI leaders perceived themselves to engage in this behavior between sometimes and fairly often.

The highest mean score reported by the SI leaders was for inspirational motivation ($M = 3.27$, $SD = 0.76$). Behaviors of leaders engaging in inspirational motivation provide a vision of what is possible and a clear understanding of shared goals. Both of these are responsibilities of the SI leader (Hurley et al., 2006), which SI leaders in this study perceived that they displayed between fairly often and frequently, if not always.

Individual consideration is shown when each individual is treated uniquely and individual support is provided (Avolio & Bass, 2004). The mean score for this scale was 3.21 ($SD = 0.48$). The SI leader can demonstrate individual consideration behaviors by engaging all students in the session, designing sessions that consider a diverse group of students, and delivering learning activities that involve all types of learning.

On the other side of the full range of the leadership continuum are passive/avoidant leaders, who make no effort toward effective leadership behaviors. They do not set goals or clarify expectations (Northouse, 2007). This style has a negative effect on desired outcomes (Avolio & Bass, 2004). The mean score for passive/avoidant leadership for SI leaders in this study was noticeably lower ($M = 0.62$, $SD = 0.45$), indicating that they perceived that they engaged in these behaviors less than once in a while. Low scores for this style signify that these SI leaders believed that they were choosing to utilize effective leadership behaviors.

Adams (2011) found that SI leaders with a diverging learning style reported designing sessions that incorporated brainstorming and gathering information by creating learning games to get the students involved with each other in small groups. Accommodating learners reported designing sessions that relied heavily on student involvement. Those with an assimilating style reported engaging in extensive talking and lecturing during their sessions. Participants with

a converging style reported incorporating a systematic application of tasks.

Almost three-quarters ($n = 25$, 75.53%) of the SI leaders in the present study were either accommodating or diverging learners. Individuals using these two styles tend to prefer to work with others, view situations from different points of view, and learn from hands-on experience. Adams (2011) concluded that SI leaders with these learning styles are more likely to design SI sessions that incorporate more active teaching and/or facilitation strategies that encourage student involvement as opposed to more passive strategies. This becomes important in regard to the foundations of SI for several reasons. For example, SI leaders have the responsibility to involve all attendees in the session with each other and with the material (Hurley et al., 2006). Furthermore, students can be motivated to attend regularly when the SI leader engages them with learning games and other interactive activities (McGuire, 2006), such as those which, according to Adams (2011), are designed by SI leaders with accommodating and diverging learning styles. SI leaders should be open to suggestions from student attendees and consider their needs so that all attendees benefit (Hurley et al., 2006). Thus, while the types of teaching/facilitation strategies incorporated by SI leaders and the impact of the various teaching/facilitation strategies on SI session attendance was beyond the scope of the present study, it is nevertheless encouraging that 25 of the 34 SI leaders in the present study had learning styles shown to be more likely to create interactive learning environments that rely on student interaction and involvement.

Recommendations for Practice

This study adds to the literature base by identifying learning styles and leadership styles of SI leaders. This addition can be of value to the work of practitioners and researchers alike. An awareness of SI leaders' preferences can shape training, recruitment, and evaluation practices. Findings can be used to establish the importance of administering learning and leadership instruments to SI leaders as part of training. When an SI leader completes the instruments, the program administrators and the SI leader gain an understanding of the SI leader's unique approach to learning and leadership. An

awareness of the approaches employed by individual SI leaders allows for individualized guidance related to the complexities of planning and leading sessions that appeal to all students. For example, if program supervisors are aware of the learning style and leadership style of individual SI leaders, they can assign SI leaders to courses that can benefit from the strategies they are likely to employ as a result, if possible, and/or coach SI leaders to be more cognizant of the strategies they employ as a result of their individual styles.

With the understanding that teachers teach as they prefer to learn and that session design can reflect learning style, SI leaders should be given the LSI as part of training. The LSI provides a language for learning preferences that can foster conversations on creating the best learning environment (Kolb & Kolb, 2005). Additionally, administering the MLQ as part of training provides a profile for leadership preferences that can be used by SI supervisors to provide individualized feedback and coach specific behaviors. These conversations can occur between SI leaders or between SI leaders and administrators. An SI leader with an understanding of how personal learning and leadership style impacts teaching sessions is more likely to plan sessions that appeal to all attendees.

Learning preferences and leadership preferences for SI leaders in this study did not have a relationship with recurring attendance. Staff involved with SI should continue ongoing marketing efforts that encourage regular attendance.

Suggestions for Research

SI is implemented in hundreds of colleges and universities across the globe. This study represented a small sample from only one of those universities. A larger, random sample across multiple universities could serve to validate conclusions drawn in this study. Further, a larger sample should be conducted to determine the influence of variables, not just the relationship.

The MLQ leader form was used to obtain information about the leadership behaviors of the SI leaders. The MLQ rater form could be administered to students who attend SI sessions and to the SI supervisor to provide a more comprehensive picture of the SI leader's leadership behaviors.

Students are sometimes enrolled in two courses with SI in the same semester. A study examining their attendance habits in relation to the characteristics of the two SI leaders could be conducted. Although the present study did not find a relationship between the learning or leadership style of the SI leader and recurring attendance of participants, it would be interesting to examine if individual SI participants were more likely to attend SI sessions of one SI leader as opposed to another, and if such attendance was a function of the learning and/or leadership style of a particular SI leader.

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The Impact of Learning Assistance Experience on Teaching Pedagogy

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Abstract

Many administrators in Learning Assistance Programs (LAPs) have teaching duties, or take on teaching duties at some point in their careers. This study was designed to examine the impact of LAP experience on classroom pedagogy. A pilot study was utilized first through listservs and email chains to ask that question of LAP professionals. After significant results in the pilot (all 27 respondents evidenced an important impact of LAP experience on pedagogy), a larger, mixed methods survey design was constructed and administered to participants in a wide variety of settings. The results in a representative sample ($n = 66$) again were consistent: LAP administrators believe their learning support experience has significantly impacted their classroom experiences and pedagogical abilities in positive ways. Taken together with a general lack of teaching instruction in graduate school, as well as the blurred lines between teaching and administrating within some campus roles, this study suggests that LAP administrators also perceive themselves to be undervalued as a resource on campus, and that their teaching experiences should be utilized more effectively.

Keywords: learning assistance programs (LAPs), administrators, mixed methods, survey research, teaching, pedagogy

Learning Assistance Experience and Teaching in Higher Education

Learning Assistance Programs (LAPs) are commonplace on campuses, and there are now thousands of LAP administrators around the county. Despite their having a strong background in

educational theory and very often classroom experience, LAP administrators are not always seen as “teaching faculty” or as having the same pedagogical expertise as full-time faculty. Yet, given that headlines continue to demonstrate that regular faculty themselves are often underprepared for teaching duties (see, for example, “Study: Teaching and Research Not Tied” by Emily Tate (2017), “Teaching Professors to Become Better Teachers” by John Hanc (2016), or “Fear of Looking Stupid” by David Matthews (2017), LAP administrators may constitute a valuable underutilized resource.

Complicating matters, LAP administrators are often seen on one side of the administration/faculty or faculty/staff divide, which in some instances limits the structural pedagogical opportunities they may have. This divide which continues to be omnipresent at many educational institutions of higher learning is a long-standing and pervasive phenomenon that impacts how ownership of pedagogy is perceived. Faculty, charged with instructing their students, may very well own the realm of instruction on campus in curricular terms, but whether or not they have a strong grasp of pedagogy and can work with individual students effectively is an ongoing debate. As Adams (2002) points out, not all graduate students have the same quantity or quality of teaching experience:

Some graduate students have no teaching experience; others have served as a teaching assistant in a couple of different courses; some have taught labs or discussion sections; others have taught a single course, and a few have independently taught several courses. (p. 3)

In order to address this, in 1993 The Preparing Future Faculty program was created by the AAC&U and CGS to outline model programs and curricula to prepare graduate students for careers as faculty (Adams, 2002).

This conversation continues today. In 2012, for example, Harvard held a conference kick-off event for a new Harvard Initiative for Learning and Teaching; as Berrett (2012) points out, the conference content “suggests a growing concern at even the most elite institutions that the classroom experience is not all it could be” (para. 8). Such a need holds with findings from other studies surveying faculty about the need for pedagogical

instruction (Robinson & Hope, 2013), reviewing literature on faculty preparedness at community colleges (Lail, 2009), and interviewing doctoral candidates (Austin, 2002). Even when faculty have instruction in pedagogy, it may not be adequate; Maynard, Labuziński, Lind, Berglund, and Albright (2017) analyzed 24 doctoral social work programs that required courses in teaching from their instructors, but noted that “very few syllabi specifically referenced teaching methods or models that have some empirical support, such as team-based learning or problem-based learning” (p. 106). Likewise, in a 2001 survey of doctoral students enrolled at 27 institutions in 11 disciplines, Golde and Dore (2001) found that there is a “mismatch between the purpose of doctoral education, aspirations of the students, and the realities of their careers,” noting that the focus is on research at the expense of learning about pedagogy or advising roles of faculty. Indeed, citing the National Research Council (2000), Andrews, Leonard, Colgrove, and Kalinowski (2011) argue that without formal instruction in theories like Constructivism, “the active-learning exercises an instructor uses may have superficial similarities to exercises described in the literature, but may lack constructivist elements necessary for improving learning” (p. 400). Though Andrews et al. (2011) did not find that faculty use of active learning pedagogy positively correlated with student gains, the researchers did find a strong correlation between the faculty’s explanation of student misconceptions, as well as faculty use of active learning to change misconceptions. Such a finding underscores the importance of understanding learning theory in the execution of any pedagogical strategy.

Again, though faculty are truly the most prominent practitioners of pedagogy on campus, they are not the only ones with expertise in such matters. While LAP administrators generally work in the following types of programs: tutoring programs, developmental education, mentoring programs, disability support, supplemental instruction, English Second Language services (ESL), retention programs, first year advising, and other related activities, almost all LAP administrators either directly or indirectly (supervising others) work with students in a variety of one-on-one, small group, and skills-oriented settings, including formal classrooms in some

cases. Very often, the practices of LAP professionals are indeed the application of learning theories; for instance, the theoretical framework of tutoring includes such concepts as constructivism, scaffolding, metacognition, and active learning (Sheets, 2012; Dvorak, 2004). Such proficiencies clearly overlap to a great degree with skillsets associated with effective postsecondary instruction, and can include such well-known techniques as active learning, problem-based learning, individualized or differentiated instruction, re-teaching material in different formats, and multi-sensory learning, to name just a few (Trammell, 2005). Adams (2005) points out that faculty are increasingly asked to develop curricula for general education that emphasizes “multicultural, international, interdisciplinary, and service learning..Yet, these issues and aspects of teaching are usually ignored in graduate programs” (p. 3). In addition, LAP professionals are often trained in action research techniques which often produce innovative pedagogy in the classroom and involve very practical interventions (Jaaskela & Nissila, 2015; Keen Wong, 2014).

Furthermore, because one of the primary charges or learning centers is student success and retention, the actions of the center are driven by scholarship which itself tends to focus on the student as an individual. This focus on the individual therefore not only drives the programming in the center, but it may also inform the LAP professionals’ choice of pedagogy. As Tinto (1975, 1993) first pointed out, a student’s sense of belonging is essential in their performance in school and decision to remain enrolled. Indeed, in accordance with Piaget’s understanding that knowledge is socially constructed, a focus on the individual learner has long been a hallmark of learning centers in all of their work, from tutoring (Dvorak, 2001) to academic coaching (Robinson & Gahagan, 2010) to work in first-year seminars (Latino and Unite, 2012). The importance of student belonging created through personal contact with faculty and administrators is tied to academic progress (Meeuwisse et al., 2010) and retention (O’Keeffe, 2013). While an important caveat here is that many services in learning centers are peer-led, the LAP is very rarely without student contact.

Despite this rich experience, faculty members have long seen learning assistance program (LAP) educators as “administrators,” and not primarily as teachers or teaching faculty. The implication of this

label “administrator” is that LAP educators do not understand the roles and business of faculty. As a result, many LAP administrators have felt undervalued by faculty colleagues or under-appreciated for their educational and pedagogical skillsets since they are most closely associated with the LAPs on campus and often do not enjoy faculty rank. Many administrators in Learning Assistance Programs (LAPs) also have some teaching duties or take on teaching duties at some point in their careers. Many are full-time teaching faculty at some point in their careers, or ultimately strive to be for various reasons including possibly the enhanced academic prestige, but also because they enjoy teaching and working with students.

This study began with the premise that the role of an LAP professional develops the very same skills necessary for teaching, which may make LAP professionals beneficial to their faculty peers who may come to the profession underprepared for teaching. This study attempted to understand more closely the LAP administrators’ perceptions of their teaching experiences through the following questions:

- Do administrators who work in LAPs gain useful pedagogical skills as a direct result of their LAP experience? (The literature review suggested they do)
- Do administrators who work in LAPs perceive themselves as better teachers as a result of their LAP experience? (The pilot indicated that they do)
- Does the faculty/staff divide or other related factors result in an underappreciation of LAP administrators’ teaching and pedagogical skills? (The pilot results suggested this might be the case)

The primary research for this study began by pilot surveying several dozen LAP colleagues and asking them some of these basic questions, then correlating the responses. The pilot results were profound in their consistency of reported issues to the point of suggesting that a richer and more in-depth study should be done.

To determine the best avenue for future study, a half dozen in-depth interviews were then conducted with key informants from the pilot group to determine if there was a greater specificity to the perceptions, understand the lexicon, and to develop preliminary

ideas about what survey or future interview questions might be. As a result of this process, a more formal survey was developed, which ultimately became the Learning Assistance Experience and Impact on Pedagogy (LAEIP) Survey (See Appendix).

The informal pilot and subsequent interviews quickly revealed that many LAP professionals considered their teaching to be greatly enhanced (or potentially enhanced, if they weren't currently teaching) by their LAP experience (Trammell, 2016). Typical of comments are these reactions shared by respondents and then transcribed:

I know that what I learned as a Supplemental Instruction leader in undergrad has had a profound impact on how I run my class... Once you understand how students learn then how could you ever go back to the "sage on the stage"?

I feel as though my prior experiences impact the work I do today because I am a firm believer in the value of differentiated instruction and intentional curricular design that includes culturally relevant pedagogical practices and an emphasis on social justice.

Working as a tutor taught me first and foremost the value of being an active listener, guiding students to develop their own lines of inquiry.

The respondents in the pilot phase ($n = 27$) all made strong claims that their learning assistance experience had significantly impacted their pedagogical skills in a positive direction. With rich pilot results indicative of themes and lines of inquiry, the work to design a larger, more complete investigation proceeded accordingly.

Method

Participants

After completion of the pilot interviews and informal surveys ($n = 27$), learning assistance professionals were recruited to complete a more extensive online survey by advertising on five common LAP listservs: LRNASST-L, FYE-LIST, TYE-LIST, SINET,

trio-sss, and wcenter. Snowball sampling was also used with pilot participants. Survey Monkey was utilized to host the online survey. IRB application resulted in exemption for the project. Three separate email calls over the course of a six-month period were used to maximize participation. Ultimately, sixty-six participants successfully completed the survey; roughly a dozen were respondents from the original pilot.

To establish baseline reliability and validity parameters, the sample population demographics in the study ($n = 66$) were compared closely to membership demographics information from one of the largest professional organizations in the field of learning assistance, the College Reading and Learning Association (CRLA). Simple t-tests (on gender, for example, with no significant statistical differences) and other meaningful comparisons (nature of home institutions; public/private; four year/two year; etc.) were conducted to ensure that the sample population was reflective of the general learning assistance staff population.

The respondents were representative of a variety of roles and levels of experience in learning assistance programs, ranging from veteran learning center directors to new faculty in developmental education, and all roles and levels of experience in-between. The complete demographics for the study ($n = 66$) and a comparison to the membership in one of the largest professional organizations are reported in the results section.

Materials and Procedure

The final LAEIP survey consisted of nineteen items; the first six were demographic in nature, and the remainder consisted of a variety of open-ended questions, Likert-type items, and checklists from which to select responses. Several of the questions subtly asked for similar types of information to enhance internal reliability. The survey followed other classic design elements such as determining a specific sampling frame, and using pilot results and elements confirmed in the literature to revise or include questions (Fowler, 2002; Kalton, 1983). The mixture of items was intentional, allowing for some aspects to be analyzed quantitatively, and for others to be reported more qualitatively in participants' own words, because survey research has traditionally worked effectively in mixed methods

designs. Later, the survey results were checked for instrument sensitivity (allowing enough room for variation but not too much for purposes of defining constructs) and other internal measures of reliability that would be consistent with the results of the earlier “critical systematic review” (Fowler, 2002, p. 108).

Although the content of the survey was initially determined by a pilot survey and the subsequent interviews, it was also reinforced by a review of the literature suggesting that postsecondary instructors are often undertrained and ill-prepared for the classroom. The popular education media, in fact, has reported on this phenomenon for some time, and this reinforced the need for such research to see what kind of pedagogical impact learning assistance actually has on classroom effectiveness (Brandzel, 2017; Patel, 2017; Weimer, 2017). In many cases, innovative pedagogy in higher education may be found in unexpected places that can benefit all classroom instruction (Griess & Keat, 2014); this research in part examined whether LAP administrators are or can be utilized in that role.

The development of the survey followed best practices. First, language used in the development of this survey deliberately tried to mitigate the self-selection bias skew towards a positive response. For example, neutral phrasing of “impacted” was used to ask about the effect of LAP experience on teaching rather than “benefited.” Further, the techniques and terminology of the LAEIP survey were developed directly from the pilot results and the literature on effective LAP administration and effective pedagogy in higher education. For instance, question 8 asked about LAP experience impact on: Understanding individual student learning needs, Embracing diversity of learners, Critiquing own instruction, Designing instruction differently, Designing assessment differently, and Working more with pacing, etc. In another question (16), pedagogical skills were framed as: Seeing how much students can struggle, Understanding developmental aspects of student progress, Seeing students underachieve in spite of working hard, Understanding systematic barriers for some students at the school, and Seeing how characteristics of instructors impact different students. And finally, in question 17, classroom strategies were framed as knowledge of: Active Learning, Service Learning, Flipped

Classroom, Group Learning, and Discussion.

Using snowballing sampling from five common LAP listservs over a period of three months, responses were collected through Survey Monkey (Kalton, 1983). Statistical analysis using basic descriptive statistics and some comparison of means for responses was completed using SPSS and a qualitative analysis was completed using open coding.

Results

The demographics of the respondents ($n = 66$) were consistent with historic profile of learning assistance in higher education (ASHE, 2010). A majority (86.4%) of the respondents identified as female gendered, while only 13.6% identified as male gendered. Although LAP administration has shifted toward greater gender balance in the recent decades, female gendered administrators still represent the overall majority of LAP administrators in higher education. Many respondents viewed their experience through a developmental education perspective as opposed to more traditional lecture style pedagogies. More than half the respondents were educated through the master's level, again very consistent with learning assistance history and practice.

Age and level of education are reported in Table 1 and Table 2, respectively.

Table 1

Responses to Item 2, "What is your age?" ($n = 66$)

Category	Number	Percentage
18 to 24	2	3%
25 to 34	6	9%
35 to 44	21	32%
45 to 54	17	26%
55 to 64	15	23%
65 to 74	5	7%
75 or older	0	---
Choose not to answer	0	---
TOTAL	66	100%

Table 2*Responses to Item 3, "What is your highest level of education?" (n = 66)*

Category	Number	Percentage
4 year undergraduate	5	8%
Master's of equivalent	39	59%
Part of PhD/EdD or equivalent	12	18%
PhD/EdD or equivalent	9	14%
Other (please specify)	1	1%
TOTAL	66	100%

Age and education responses were consistent with the shifting demographics of LAP administrators trending toward younger professionals entering the profession, and LAP administrators tending to be more highly educated in recent decades. The sample was also representative of types of institutions with LAPs in higher education including 4 year public schools (28%), 4 year private schools (38%), and 2 year public schools (community colleges) (32%), the three of which represented 98% of the sample.

Respondents also worked in a wide variety of LAP settings, which is reported in Table 3.

Table 3*Responses to Item 5, "Primary LAP area of most recent responsibility (you can check more than one)" (n = 66)*

Category	Number	Percentage
Tutoring program	43	65.2%
Mentoring program	10	15.2%
Disability support	10	15.2%
Learning center/academic center	44	66.7%
Developmental education	4	6.1%
Reading or writing	14	21.2%
Other	10	15.2%

Fully two-thirds of all participants identified as having a primary administrative role in a learning center or academic center; nearly two-thirds identified as being closely associated with tutoring programs. This data is again consistent with the history of LAPs and

those who have been hired to administer them (ASHE, 2010).

Item 6 in the survey asked respondents about the best characterization of their teaching duties, selecting all statements that applied. Nearly half (48.5%) reported that they currently teach part-time; 6% reported that they currently teach full-time. Exactly half (50%) reported that they had taught in the past, and 15% that they plan to teach in the near future. Taken in summary, this sample represents a significant amount of teaching, with the vast majority of it being part-time.

Following that, respondents indicated on a seven point scale that their work in a LAP setting has had a profound effect on their teaching practices (mean = 6.22, $n = 65$). Nearly half or 49.2% of respondents ($n = 32$) rated this response with the highest numeric score possible (i.e. 7). Later, comments on open-ended items fully confirmed this important data.

Respondents were asked to specify the kinds of impact LAP experience has on pedagogy, which is reported in Table 4.

Table 4

Responses to Item 8, "Ways LAP experience has impacted the most" ($n = 65$)

Category	Number	Percentage
Understanding individual student learning needs	56	86.1%
Embracing diversity of learners	37	56.9%
Critiquing own instruction	43	66.2%
Designing instruction differently	51	78.5%
Designing assessment differently	34	52.3%
Working with more pacing	17	26.2%
Other (please specify)	4	6.2%

The two highest reported categories, Understanding individual student learning needs and Designing instruction differently, are two skillsets that are commonly not taught in non-Education graduate programs, and are therefore more likely to be valued coming out of a LAP experience. After rating the impact LAP has had on their past, present or future teaching, participants were asked to specify the impact. The results in Table 4 reflect aggregate responses, irrespective of the participant's impact rating.

To ascertain the importance of teaching to their roles as LAP professionals, regardless of being assigned a course load, Item 9 asked respondents to weigh on a seven point scale how much their LAP experience was about administering centers as opposed to actually teaching students and working with them. The response (mean = 4.83, $n = 65$) indicated that the perception was skewed significantly (almost two standard deviations) to the teaching side of the equation, indicating that LAP professionals in this sample see their jobs as being more focused on interacting with students than performing administrative duties.

Item 10 which followed then asked to what extent respondents felt their experience interacting with students and teaching could be valuable to their full-time faculty colleagues. Again using a seven point scale, the respondents indicated quite strongly (*mean* = 6.29, $n = 66$) that they believed their experience could be extremely valuable to their full-time teaching colleagues, with more than half (54.5%) rating the item the highest possible score (i.e. 7).

Respondents were asked in Item 11 about what their teaching choice would be if they had flexibility in the future: 57.6% responded that they would choose to teach more; 13.6% would choose to teach less. If the self-assessed values of the LAP professionals' understanding of pedagogy as a result of their experience is correct (questions 7 and 10), then together with LAP professionals' willingness to serve more suggests they are underutilized. However, it is not known, of course, if the LAP professionals themselves meet the requisites for any given course offering on a campus. Even admitting this, however, one could see how the LAP professionals' understanding of pedagogy and willingness to teach could perhaps be aligned with faculty development offerings which both capitalizes on the underutilized resource of LAP as educator and meets the need (as discussed in the review of the literature) of faculty development.

Item 12 asked respondents if they thought that typical full-time teaching faculty were trained enough in pedagogy, course design, and assessment. Nearly 9 in 10 respondents in this sample believed that faculty are not trained enough in those critical areas; more than half (51.5%) said the answer was no, faculty are not prepared enough for teaching, and over one third responded that faculty are prepared

“not at all” (34.9%). The results echo previous studies of faculty preparedness (Maynard et al., 2017; Robinson & Hope, 2013; Berett, 2012; Lail, 2009; Adams, 2002; Austin, 2002).

Items 13 ($n = 63$), 15 ($n = 52$), 18 ($n = 53$), and 19 ($n = 29$) were open-ended questions that allowed for longer narrative responses. They asked about classroom experiences and interactions with full-time faculty colleagues, and will be discussed more fully in the following discussion section.

Item 14 asked if respondents believed that they were better instructors as a result of their LAP experiences. Fully two thirds (66.7%) responded “yes,” and another 25.8% as “probably.” No one chose the answer “probably not.” A small group (6.6%) chose “other,” usually meaning that they were different in some way as a result of the experience. This is a high percentage of respondents answering in the overall affirmative, although the nature of study did have a self-selection bias that could also be manifested here. However, the survey was designed with this in mind, and attempted to use language that didn’t presuppose a positive response.

Item 16 asked respondents to rank five items from the most impactful to the least impactful, as they related to LAP experience when teaching (seeing how much students can struggle; understanding developmental aspects of student progress; seeing students underachieve in spite of working hard; understanding systemic barriers for some students at the school; seeing how characteristics of instructors impact different students). A simple t-test with an expected value of 3 (the mean score of randomly rating 5 items 1 through 5) revealed no significant difference in rankings ($p < .05$), demonstrating that the respondents share belief in relatively equal levels of importance for the items.

Item 17 asked respondents to rate the likelihood of using certain techniques as a result of their LAP experience on a scale of 1 to 5, with 5 being more likely. Respondents were much more likely, for example, to use active learning techniques as a result of their LAP experience. The results are reported below in Table 5.

Table 5

Responses to Item 17, “Rate the likelihood of using this technique as a result of LAP experience”

Category	Number	Mean
Active Learning	66	4.65
Service Learning	66	2.88
Flipped Classroom	65	3.49
Group Learning	66	4.12
Discussion	65	4.48

Discussion

The open-ended response items in the survey offered an opportunity for respondents to enrich their answers and provide concrete examples of how their teaching is informed by their LAP experience. Item 13, for example, asked respondents to give a brief example or anecdote that illustrated how their LAP experience has impacted their instruction. Thirty-seven participants (56%) responded to item 13. Two of the responses were removed from analysis as they were not anecdotes. In an analysis of the responses, 8 major thematic impacts were observed: understanding students (11 responses), change in classroom strategies (10 responses), integration of study skills/metacognition (8 responses), alteration of assessments or assignments (4 responses), improved feedback mechanisms (3 responses), prioritization of outcomes (1 response), and reading additional theory (1 response). Therefore, the largest impacts observed and reported by participants centered around understanding students (31.4%), followed by change in classroom strategies to a more inclusive and active environment (28.6%), and the integration of study skills and metacognition (22.8%). A sample of the responses provides evidence of the impact:

I think more carefully about comments I make on student writing, and I am less likely to assume reasons for students' poor performance.

Using many different methods to convey the same topic, and allowing students to experience to use what they are learning in a 'real world' application.

Understanding how learning occurs, and creating environments that can facilitate learning. Specifically, utilizing active learning classroom techniques (students and teacher are equally engaged in the class/content).

In the “old days” I would rely heavily on text-based assignment sheets, papers and reading, and not varied teaching strategies. Now I incorporate many more activities, presentations, and small group work.

Due to my LAP experiences, I am more able to embrace and understand the characteristics of “at-risk” learners and see students as individuals not just as a whole class. I also know how to build relationship and purposefully incorporate these elements into the entire teaching continuum from syllabus design to grading and more. In my LAP work, I hear and understand common student concerns about their classes and instructors and am able to plan to minimize these in my own classroom.

I taught a college success class, and always invited my students to arrive 10 minutes early to class to discuss challenges they were facing that impacted their ability to be successful. Rather than telling them what to do, I encouraged them to talk out their problems and help each other. This idea came from observing peer tutors and tutees understanding and supporting one another in our learning center. This helped students build relationships with one another, which is so important to retention in a commuter, community college.

Item 15 asked respondents about a time when something happened in class and they recognized that it connected back to LAP experience. Fifty-two (52) participants responded to this question; 20 responses indicated that they could not think of a particular instance, though some of these also indicated that they had not taught recently which may be a factor. Another possibility

for the number of negative responses is that participants felt such information was included in the previous question asking for an anecdote demonstrating impact and did not have an additional one to share. Two participants said that they could not recall a particular time but noted that it had certainly been impactful, one saying “every class.” Thirty (30) responses, therefore were able to be analyzed for this question. In these 30 responses, 5 themes emerged: increased awareness of students’ needs (18 responses), increased study skill use (6 responses), increased awareness and utilization of resources on campus (4 responses), shift in role to facilitator not lecturer (3 responses), and focus on group work (1 response). Analysis of the qualitative responses indicated that LAP professionals have been impacted strongly with regards to their understanding of the student body and their needs, which is also reflected in the quantitative analysis discussed above. That using study skills in the classroom was the second most noted impact of LAP experience on participants’ teaching was unsurprising, given that study skills are so pervasive in any LAP, regardless of its focus or size. A sampling of some responses to illustrate these findings follows:

Yes, several years ago I was facilitating a classroom discussion on Ishmael Beah’s *A Long Way Gone: Memoirs of a Boy Soldier*. As students began to discuss their perceptions of the author’s experiences, I noticed a change in body language in one of my students. I treaded [sic] gingerly, but asked if she would like to share what she was feeling. It turns out that she had experienced a harrowing escape from Liberia during the civil war after suffering the loss of her father and other family members. I immediately felt the change in energy in the room as the class responded to their classmate and thanked her for sharing her perspective. I credit my experiences as a learning professional for teaching me how to respond to sensitive situations and for teaching me how to create safe spaces for learning.

Working in the Academic Advising Center means I am also tied into the resources on campus. In my Seminar

classes, I have nontraditional (more than 3 years out of HS) students that include Veterans, older students, students with other responsibilities, etc. Several times, I have had students dealing with PTSD, addiction issues, and general anxiety & depressive disorders. My job has given me the connections on campus to get these students the assistance they need with a simple phone call. When I was solely an adjunct (or Non-tenure track instructors as they call them here), I didn't know about the resources, never mind who the best offices/people were to call to help students in need. Having those connections with Student Support and Success service offices allows me to be more aware of how to support student needs. It has also given me the opportunity to rethink how to teach to different learning styles and abilities, particularly if being successful in college is being hampered by what's going on outside the classroom.

Following the needs of students - at midterms, I ask students what other information they need/want to cover (that hasn't been addressed yet this semester or something they need more information on), and adjust the semester schedule accordingly to match those needs.

Many times. Even just thinking in terms of student development (Chickering) or andragogy (Knowles) provides a base for considering learning factors. Also, training tutors on information processing, neuroscience of learning, and the role of social interaction shifts the thinking about teaching toward really planning for learning.

I had a student who sat at the back of the class (hat on, looked bored). The next class period I moved everyone around and focused on students connecting with other learners as we discussed content. By the end of the semester, this freshman was contributing to class regularly.

Yes. Being relevant is crucial [to understanding students]. When you see students not participating, you begin to question approach. I co-facilitated a course this semester, and what I noticed is that relevance was required. Once students made that connection to the instructor, participation and engagement resulted.

To further assess the value LAP may have for their institutions, item 18 asked what advice respondents would give to their full-time teaching colleagues. Seventeen participants responded to this section meaningfully (10 additional participants responded with “no” or N/A). Of these 17 responses, 9 thanked the researchers for investigating LAP impact, indicating, perhaps, a strong desire to be validated and appreciated on their campuses for their knowledge in the pedagogical arena. No other strong themes emerged. A short sample follows:

Understanding students, and how they learn, can increase the efficacy of your teaching. It helps in all stages from designing syllabi, building lectures, and crafting assignments--even (and perhaps especially) in giving feedback.

Don't make assumptions about your students, don't be vague in expressing your expectations of students, don't give them unclear assignments or 'extra' reading.

Understanding how to increase student levels of processing is important to teaching. You cannot just teach information without showing students how to process it outside of the classroom.

I'm a big promoter of reflection and metacognition in my classrooms. It is such an important, yet often overlooked, skill. Students having insight about their learning process helps them, but if they can share that with the professor, it also is great feedback for the professor. I would encourage profs to incorporate reflection into their curriculum.

Student learning is the primary focus of teaching. I would ask faculty to consider the following questions. How do you promote student learning? What do you do to consider the learning needs of your students? What resources are available to assist students outside the classroom and how do you facilitate students taking advantage of the resources?

I would tell them that they need to provide a connection with their students. Relationships are crucial. This is why LAP is so effective. It creates a humanistic approach to educational pedagogy that is needed in order to be successful and in order to retain the student with successful progression toward graduation.

In order to fill any possible gaps in the instrument, item 19 asked for any other general comments:

The field of learning assistance has so much to offer the greater community in higher education and is just beginning to be more highly valued by administration as true partners in learning. LAP professionals must learn to be more political in their own institutions as well as nationally. One area we should address directly is the splintering of our national organization into 5 or 6 organizations. It weakens our national voice and interferes with the development of knowledge in our field.

Every faculty member should be taught basic learning strategies so that they can share these with their students.

I'd emphasize the community of practice of LAP professional and para-professionals; one's experience in this field is contributed to by many.

Summary and General Conclusion

This study began with the premise that the role of an LAP professional develops the very same skills necessary for teaching, which may make LAP professionals beneficial to their faculty peers who may come to the profession underprepared for teaching. However, they often perceive themselves as underappreciated by either their institutions and/or faculty colleagues for their pedagogical knowledge, teaching skills, and ability to interact in professionally meaningful ways with full-time, non-LAP faculty members. Both the results of the pilot and the subsequent study confirm underappreciation and underutilization in the sample populations.

Respondents' value of teaching over administration, lessons learned as a result of LAP experience, and perceptions of the preparedness of faculty, all taken together suggest that the LAP professionals may have more to offer their institutions beyond LAP administration and more traditional forms of teaching open to LAP professionals, and that their potential may be vastly underestimated and underappreciated. Nearly half of respondents rated the impact of their LAP experience as high as possible on a 7 point scale, and data further suggested that LAP professionals believe their role is more centered on teaching and working with students than administering the center itself, pointing to a rich body of experience. Indeed, the learning from this experience is widely recognized by LAP professionals; nearly all say that it has impacted what they consider their teaching.

The value of LAP professional work with regards to teaching stems not only from the literature and research necessary to administer LAPs, but from the day to day practices themselves. The qualitative responses likewise show that the experiences are all applied theory, and, notably, those applied theories fall in line with current trending best practices in higher education such as active learning, universal design, and student-centered classrooms. Although this study did not directly address the utilization of LAP professionals on their respective campuses, the data suggests that LAP professionals feel they could be helpful on their campuses (item 10). Further research is necessary to determine the degree to which

universities are utilizing LAP professionals to advance teaching on their campuses, but given the administrative/faculty divide on most campuses and the workload common to LAP professionals, the researchers anticipate such studies will find that LAP are, in fact, underutilized in this regard.

As budgets tighten and workloads shift, this is hardly a call for more work to be placed on the desks of LAP professionals. But it is most certainly a call for much greater appreciation and opportunity. Teaching is often referred to as an art, and in this case LAP professionals are well-versed in theoretical and practical pedagogy and perceive themselves as improved teachers as a result, whether they have a traditional classroom or not. The underutilized and underappreciated skills of LAP professionals could be harnessed, perhaps, with additional money and staff. LAP professionals, given more resources, could certainly offer professional development, lead workshop series, and observe faculty in the classrooms. It must be noted, however, that the administrative/faculty divide is a wide bridge not crossed with funding alone. Although it was beyond the scope of this initial study, a further exploration of the socially constructed roles and understandings is called for.

This study also highlights a paucity of research into the significance of LAP professionals and their unique experiences as it relates to higher education pedagogy. While obtaining valid and reliable results with a relatively simple survey and limited sample size, this study needs to be completed on a larger scale, taking more factors into account such as campus utilization of LAP professionals, in order to increase generalizability. While research has generally focused with great energy on student outcomes, there has not been as much research strategic utilization of human and pedagogical capital. If nothing else, it is hoped that this study and further research will increase the appreciation that other faculty and administrators have for the contributions that LAP professionals can and often do make inside and outside of the classroom.

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Appendix

Learning Assistance Experience and Impact on Pedagogy (LAEIP)

Informed Consent

Many post-secondary learning support administrators (tutoring, mentoring, disability support, developmental courses, first-year advising, etc.) also have part-time or full-time teaching duties. This study attempts to examine the question of how experience with LAPs (learning assistance programs) impacts teaching philosophies and techniques of pedagogy when the same individual moves back and forth between administrating and teaching.

This research, when completed, will be shared with participants and with the larger academic community in the hopes of raising awareness and appreciation for the unique impact such experience has on instruction, and also in the hopes that LAP professionals will be given more appropriate opportunities to teach and to impact the pedagogy of their full-time faculty colleagues.

Completion of the survey is voluntary, and a respondent can close the window or quit the survey at any time and their answers will not be saved. The question items are designed to be anonymous, and demographic data is only gathered to see if trends within the sample are evident that might suggest further lines of inquiry.

The primary investigator is Associate Professor of Sociology Jack Trammell at Randolph-Macon College, who worked in a learning center for 16 years and now is a full-time teaching faculty member. The PI can be contacted at: jtrammel@rmc.edu

Your input in this research is important, and valued. Thank you for taking time to contribute to a better understanding of this phenomenon. The survey will take on average 10 to 12 minutes to complete.

Thank you.

Working more with pacing, Other (please specify)

9. To what extent would you describe your LAP experience as

All about mgmt. and training All about teaching students
0 1 2 3 4 5 6

10. To what extent do you feel that your experience in LAPs (and potentially your teaching experience) could be valuable to full-time teaching colleagues?

Not at all Might be greatly valuable
0 1 2 3 4 5 6

11. If you could choose to, would you

Teach more, Teach less, N/A, Other (please specify)

12. Do you think typical faculty are trained enough in pedagogy, course design, and assessment?

Yes, Mostly, Not really, Not at all, Other (please specify)

13. Can you give a brief example or anecdote that illustrates how your LAP experience has impacted your teaching? (type N/A to skip)

14. Are you a better teacher as a result of your LAP experience?

Yes, Probably, Not sure, Probably not, Other (please specify)

15. Open-ended response: Can you remember a time when something happened in class and you recognized that it connected back to your LAP experience?

16. Rank the following in order from least impactful to most impactful when considering LAP experience impacting teaching

Seeing how much students can struggle, Understanding developmental aspects of student progress, Seeing students underachieve in spite of working hard, Understanding

systematic barriers for some students at the school, Seeing how characteristics of instructors impact different students

- 17. For each of the following items, rate whether you are more or less likely to utilize it in the classroom as a result of your LAP experience**

Less Likely More Likely

0 1 2 3 4 5 6

Active Learning

Service Learning

Flipped Classroom

Group Learning

Discussion

- 18. If you could tell your full-time teaching colleagues something about your LAP experience, what would it be?**
- 19. Are there any general comments you would like to share?**

Educational Opportunity Program (EOP) at a Selective Public University: Initial Findings from a Longitudinal Evaluation Study

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Author Note

This article was adapted from a paper with the same title that was presented at the 2017 *National Symposium on Student Retention* (NSSR) in Destin, FL and appeared in the 2017 NSSR conference proceedings.

Abstract

In this study, we examined academic outcomes among students from low-income and academically disadvantaged backgrounds who participated in the Educational Opportunity Program (EOP) at a selective four-year public comprehensive college in the Northeast. We found that provisionally admitted EOP students earned comparable first-semester grades and had similar first-year retention and continuous enrollment rates to students with far higher admission scores. Disadvantage-associated disparities, however, persisted in two domains: the proportion of credits earned in the first semester and transfer rates to associate- vs. bachelor-degree granting institutions at three-year follow-up. We conclude our paper with policy recommendations for further enhancing academic momentum among EOP students towards timely bachelor-degree attainment.

Keywords: provisional admission, Educational Opportunity Program (EOP), college retention, academic momentum

Students in the United States who are African-American or Latino/a, from low-income backgrounds, or who do not have

a parent who completed college have lower enrollment rates in bachelor degree-granting postsecondary institutions—particularly selective bachelor-degree granting institutions (see Bastedo & Jacquette, 2011 and Douglass & Thomson, 2012)—than other students (Ma, Pender, & Welch, 2016; Musu-Gillette et al., 2016). On average, such students are also less likely to earn a bachelor's degree within six years than students from backgrounds that have been historically well-represented on college campuses (Ginder, Kelly-Reid, & Mann, 2016; Ma et al., 2016; Nichols & Clinedinst, 2013). The goal of the current study was to evaluate the effectiveness of a provisional admission program in mitigating these outcomes among students from underrepresented backgrounds during their transition to college and subsequent three years at a selective public comprehensive college in the Northeast.

Literature Review

Access to Bachelor-Degree Granting Institutions

National data show that college students who are from low-income backgrounds and students who are the first in their families to attend college are far more likely to begin their postsecondary studies at two-year associate degree-granting institutions (community colleges) than students from high income backgrounds and students from homes in which one or more parents attended college or earned a graduate or professional degree (Bozick & Lauff, 2007; Nichols & Clinedinst, 2013). First-generation college students, who are disproportionally from low-income backgrounds, tend to be less knowledgeable about the process of applying to college and for financial aid and score lower, on average, on standardized college entrance tests than their peers (Chun & Evans, 2015). Because both income and standardized admission test scores are directly related to four-year college enrollment, students who are underprepared academically and from low-income backgrounds have the lowest likelihood of enrolling in four-year colleges (Bozick & Lauff, 2007; Ma et al., 2016). Furthermore, students who attend community colleges have much lower rates of earning a bachelor's degree than students who begin their studies at four-year institutions (see Nichols & Clinedinst, 2013), compounding socio-economic disparities in higher educational enrollment and attainment.

Need for Support

Students from economically and educationally disadvantaged backgrounds are less likely to have taken college preparatory courses in high school (Chen, 2005; Rivas-Drake & Mooney, 2008). Correspondingly, first-generation students and students from low-income backgrounds have been found to feel less academically prepared and to perceive their study skills, math skills, and reading skills to be inadequate for college-level coursework (Rivas-Drake & Mooney, 2008; Stebleton & Soria, 2012). According to Collier and Morgan (2008), first-generation students report struggling to master the student role and to meet professor expectations. Students from economically and educationally disadvantaged backgrounds may also struggle with issues such as stereotype threat (Cohen & Garcia, 2005; Massey & Fischer, 2005; Steele & Aronson, 1995), race-related stress (Cokley, McClain, Enciso, & Martinez, 2012), family financial responsibilities (Gloria & Rodriguez, 2000; Phinney, Dennis, & Osorio, 2006), sense of belonging on campus (Walton & Carr, 2012), and teacher misperceptions (Fitzpatrick, Henninger, & Taylor, 2014), all of which can threaten their chances of persisting towards their degree. Ongoing academic support and social integration have the potential to ameliorate these issues (Fitzpatrick et al. 2014; Winograd & Rust, 2014).

Provisional Admission Programs

Provisional admission programs open doors to students who would not typically be admitted to more selective four-year institutions. Under the auspices of such programs, students who demonstrate the potential to succeed academically are admitted despite high school grade point averages and scores on standardized admissions tests that fall below conventional cut-offs for admission. Upon acceptance, students are provided with academic and other types of support to assist them in meeting their potential. Nichols and Clinedinst (2013) found that provisional admission programs help students build relationships with peers, staff, and faculty while strengthening academic skills, study and time management skills, and academic self-efficacy. *Access* and *support* are cornerstones of such programs (Nichols & Clinedinst, 2013).

Rationale and Research Questions

Provisional admission programs are a promising approach to reducing disparities in higher educational achievement and attainment. However, methodologically rigorous longitudinal investigations regarding the effectiveness of such programs at selective bachelor degree-granting colleges and universities in the United States are rare in the published literature. With the goal of contributing to this body of research, we conducted a quantitative evaluation study of the Educational Opportunity Program (EOP), a provisional admission program at a selective public comprehensive college in the Northeast. Using institutional level data, we tracked the 2010 freshman cohort through the fall of 2013, comparing achievement, persistence, and retention between EOP students and non-EOP students. The following research questions were posed:

1. To what extent did the EOP program increase the representation of students from African-American and/or Latino/a, first-generation, and low-income backgrounds?
2. In which domains and to what extent were prototypical (from African-American and/or Latino/a, low-income, and first-generation backgrounds) EOP student outcomes comparable to prototypical (from none of these underrepresented backgrounds) non-EOP student outcomes?
3. In which domains were prototypical EOP student outcomes comparable to nearest non-EOP neighbor (African-American and/or Latino/a non-EOP) student outcomes?
4. In which domains and to what extent were prototypical EOP students' outcomes better than outcomes that would have been predicted based on admission scores alone?

We also traced the educational path followed by students who were not retained to examine the extent to which EOP students differed from other students in terms of: (a) continued pursuit of studies in higher education, and (b) type of institution attended (two-year vs. four-year) post-transfer, if any.

EOP Program Description

The Educational Opportunity Program (EOP) is a provisional admission and educational support program. Its goal is to improve access to postsecondary education and promote retention among students who have been historically underrepresented. Students must be from low-income backgrounds (i.e., federal PELL grant-eligible), qualify as academically disadvantaged (see “Provisional Admissions Programs” section above), and demonstrate the potential to succeed academically to be eligible to participate in the program. Many EOP students are Latino/a and/or African-American and identify as first-generation college students. Students apply to EOP via a separate application, with EOP student admission to the university contingent upon acceptance to the program by EOP staff. Admission to the EOP program is competitive.

A broad range of support services are provided by the EOP program at the institution where the current study took place. Students are required to participate in: an extended summer orientation program prior to students’ first semester; regular meetings (at least three times per semester) with advisors throughout the students’ college years to discuss professional goals, educational experiences, and personal adjustment; a seminar during students’ first semester covering a range of topics including study skills and college student identity; study groups in both English composition and mathematics; and the monitoring of mid-semester academic performance by EOP counselors, who are then equipped to recommend academic support avenues and discuss satisfactory/unsatisfactory grading or withdrawal options for students at risk of failing a course. The program also offers peer mentorship, inducts high-achieving EOP students into an honors society, and hosts a special graduation ceremony. Students can lose their place in the program if they do not abide by a contract stating that they will obtain academic help (e.g., seek tutoring from the Learning Center on campus) when needed. Students must also maintain a grade point average (GPA) that surpasses the level associated with academic probation to maintain their place in the program.

Method

The current study used quasi-experimental methods, comparable to those used in non-equivalent groups pre-test post-test designs, to examine academic and retention outcomes (“post-tests”) relative to admission score (“pre-test”). Non-equivalent groups pre-test post-test designs are appropriate when comparison groups are drawn from different populations or selected into treatment based on different criteria (Shadish, Cook, & Campbell, 2002). While this type of study does not permit us to draw causal conclusions, such a study design has the potential to provide evidence for program effectiveness, particularly if the students who would not have attended this college without the program performed similarly to students who were admitted to the college unconditionally. Similarly, we may draw conclusions about the effectiveness of the program if EOP students had more positive outcomes than would be predicted by local and national benchmarks. We employed linear and logistic regression analyses to look at the extent to which admission scores and participation in the EOP program predicted the outcomes under investigation. All continuous variable scores were standardized prior to analyses so we could interpret statistically significant findings as effect sizes. Results from regression analyses allowed us to compare prototypical EOP students to: (a) prototypical non-EOP students, and (b) non-EOP students who identified as African-American and/or Latino/a (“near neighbors”).

Sample

The sample (see Appendix A, Table 1) consisted of 1085 students who entered the college in the fall of 2010 and completed their first semester. The sample included 121 EOP students (11.1% of the total sample) and 964 non-EOP students (88.9% of the total sample). Among EOP students, 100% received PELL United States federal financial aid, an eligibility requirement for participating in the program, along with not qualifying for admission under typical standards. Also among EOP students, 90.1% identified as first-generation college students and 81% identified as African-American and/or Latino/a. The remaining 19% of EOP students identified primarily as Asian and/or Caucasian. A 74% majority of EOP students in this study were first-generation college students who identified as African-American and/or Latino/a. These students are

referred to as the “EOP reference group” or “prototypical EOP students” in the results of relevant analyses reported below. About a third (33.9%) of EOP students began their first semester with prior college-level course credits.

Non-EOP students were much less likely than EOP students to be from low-income backgrounds, to be first generation college students, and/or to identify as African-American and/or Latino/a. Among non-EOP students, 18.5% received PELL financial assistance, 7% identified as first-generation college students, 12% endorsed African-American and/or Latino/a as a cultural identity, and 6.5% endorsed Asian as a cultural identity. A 71% majority ($n = 681$) of the 964 non-EOP students were neither first-generation college students nor African-American and/or Latino/a, nor did they qualify for PELL financial assistance. These students are referred to as the “non-EOP reference group” or “prototypical non-EOP students” in the results of relevant analyses reported below. Only ten non-EOP students, 1.04% of the total non-EOP sample, identified as first-generation, low-income, and African-American and/or Latino/a. Sixty-seven percent of non-EOP students began their first semester with prior college-level course credits.

Variables

All variable information was accessed from Institutional Research data at the college where the study took place. Background variables included gender, cultural background, socio-economic status, and whether students were first-generation college students. Because we were particularly interested in students from underrepresented backgrounds whose retention and graduation rates tend to be lower and to maximize power to detect smaller effects, we created a combined group of students who self-identified as African-American and/or Latino/a. Students were categorized as “other” if they endorsed neither African-American nor Latino/a. Students were categorized as “low-income” if they received a federal PELL grant. PELL grants are need-based and provided primarily to undergraduate students to increase access to postsecondary education. Finally, students were categorized as first-generation college students if they completed a Free Application for Federal Student Aid (FAFSA) form and reported that the highest level of schooling completed by each

parent/guardian was high school or below.

Admission scores for each student were re-derived by the investigators from total SAT score and high school GPA via the same formula the admissions department at the university used to convert scores and select applicants for admission. This formula weighted overall SAT score and high school GPA equally. A variable that reported if students had earned college credits (yes/no) prior to enrollment was also employed as a predictor of academic outcomes and retention.

Outcome variables in the current study included: first-semester GPA; first-semester number of credits earned; whether students earned all credits attempted in the first semester; continuous enrollment during the first year of college; and first-year retention. Students who were not retained were further categorized into four different groups: returned to college later, transferred to an associate's degree-granting institution, transferred to a bachelor's degree-granting institution, or did not return to a post-secondary degree-granting institution during the time frame of the study (e.g., "stop-out").

Missing Data

Three variables had missing values: sex (two non-EOP values, .18% missing), high school GPA (four non-EOP values, .37% missing), and SAT (72 values, 6.64% missing across the entire sample; EOP $n = 1$ or .8% missing within EOP; non-EOP $n = 71$ or 7.37% missing within non-EOP). Most students who did not take the SAT provided scores from the ACT ($n = 71$), an alternate admission test. The students who provided only ACT scores had, on average, high school GPAs that were 1.26 points higher on a 100-point scale and first-semester college GPAs that were .027 points higher on a 4-point scale than those who provided SAT scores alone. Missing data for SAT scores were therefore, to some degree, directly related to academic achievement at the secondary and postsecondary level.

Multiple imputation procedures (MI) were employed using SPSS 23 (IBM SPSS Statistics for Mac, version 23, IBM Corp., Armonk, N.Y., USA) to estimate probable values for the missing data described above. Before the data to be analyzed were imputed, an exploratory analysis was run to examine Markov Chain Monte Carlo (MCMC) fully conditional specification (FCS) algorithm convergence.

Two imputations with 1000 iterations each were run, and trace plots of means and *SDs* for high school GPA, SAT Math, and SAT Verbal were generated. After this exploratory imputation, we used Enders' (2017) diagnostic macro program to assess convergence. All three continuous variables with missing values (high school GPA, SAT Verbal, SAT Math) converged between 0 and 100 iterations with potential scale reduction (PSR) factors < 1.05. Sample autocorrelation function (ACF) plots for these variables also appeared normal.

After convergence was established and based on Graham (2012) and Enders' (2010) recommended procedures, we ran the MCMC FCS algorithm again to generate 40 data sets with 200 iterations. After imputation, SAT scores were totaled, scores were standardized, and interactions of interest between program participation and continuous variables were created across the new master data set. All subsequent analyses were then carried out via SPSS 23 across each imputed data set. Pooled results across all 40 imputed data sets are presented below.

Results

Representation on Campus

In the freshman cohort under investigation, the EOP program increased the representation of low-income students in the student body from 178 (18.5%) to 299 (27.6%), a 68% increase. The EOP program also increased the representation of students who were raised by parent/guardians without a college degree from 67 (7%) to 176 (16.2%), more than doubling the number of students who were first-generation college students who would have otherwise enrolled. Finally, the EOP program increased the representation of African-American and/or Latino/a students on campus from 116 (12%) to 214 (19.7%), an increase of 84.5%.

Among the 116 African-American and/or Latino/a non-EOP students, 40 (34.4%) received PELL financial aid, and 23 (19.8%) identified as first-generation college students. While less socioeconomically disadvantaged on average than EOP students, these students were about twice as likely to be from low-income backgrounds than the other 848 non-EOP students, among whom only 44 (5.2%) identified as first-generation college students and 138 (16.3%) received PELL financial aid.

Admission Scores and Prior College Credits

EOP students entered college with high school GPAs that were much lower (a difference of 1.569 *SDs*), on average, than those of non-EOP students: the difference between the mid-80s (EOP $M = 83.829$, $SD = 4.95$) and low 90s (non-EOP $M = 91.002$, $SD = 3.84$). EOP students also had total SAT scores that were lower (2.12 *SDs*), on average, than the SAT scores of non-EOP students, a difference of approximately 250 points. Non-EOP students who identified as first-generation ($n = 67$) had total SAT scores that were .378 *SD* lower than non-EOP students who did not identify as first-generation ($n = 897$), a difference of about 40 points. Non-EOP students who identified as African-American and/or Latino ($n = 116$) had SAT scores that were .354 *SD* lower than non-EOP students who did not identify as African-American and/or Latino/a ($n = 848$), also a difference of about 40 points. On average, EOP students had a combined high school GPA/SAT admission score that was 2.25 *SDs* lower than that of non-EOP students. All the differences reported above were statistically significant at a $p = .000$ level.

While 646 (67%) of non-EOP students had earned credits from college-level courses taken prior to starting college (see Appendix B, Figure 1), a much smaller proportion of EOP students had earned such credits, $n = 41$ (33.9%). The odds of an EOP student entering the university with a successful experience in a college-level course were a quarter that of non-EOP students, $OR = .252$ ($.169 = .376$), $p = .000$. More specifically, the odds of an EOP student entering the university with college credits were approximately 1:2, whereas the odds of a non-EOP student entering the university with college credits were approximately 2:1. The proportion of non-EOP students who identified as African-American and/or Latino/a and entered the university with college credits was 57.8%, 10% lower than other non-EOP students and nearly 25% higher than EOP students.

First-Semester Academic Outcomes

The magnitude of first-semester GPA (post-test) differences between EOP students and non-EOP students was much smaller than the magnitude of admission score (pre-test) differences. Reference group EOP students (first-generation, African-American

and/or Latino/a, low-income) earned a standardized first-semester GPA of $-.278$, on average, while reference group non-EOP students (not described by any of the characteristics listed above) earned a standardized first-semester GPA, on average, of $.100$, about the difference between a letter grade and one “step” up from that letter grade (e.g., the difference between a B+ and an A-). As with admission score, typical non-EOP students performed better academically than typical EOP students. However, the difference between average post-test scores, $-.378$, was much smaller ($< 20\%$ of) than the difference between pre-test scores, -1.381 . EOP students who identified as African-American and/or Latino/a had an average first-semester GPA that was only $.13$ *SD* lower than that of non-EOP students who identified as African-American and/or Latino/a ($-.244$), a difference of $.05$ on a 4-point scale. This difference was not statistically significant, $t(212) = .510$, $p = .611$. Furthermore, the small magnitude of this difference suggests that EOP students with far lower admissions scores (-2.217 *SDs*) and greater social disadvantages than non-EOP students from African-American and/or Latino/a backgrounds had almost identical average first semester GPAs.

When the average admission score for EOP students who identified as African-American and/or Latino/a was used to calculate the predicted first-semester GPA for non-EOP students who identified as African-American and/or Latino/a, according to the results from a multiple regression analysis (see Appendix A, Table 2), the resulting predicted GPA was between $-.637$ (female non-EOP students who identified as African-American and/or Latino/a) and $-.997$ *SD* (male non-EOP students who identified as African-American and/or Latino/a) below the average performance of reference group EOP students ($-.278$). This is equivalent to the difference between a B and the C to C+ range. These results suggest that prototypical EOP students performed better than we would have expected “nearest-neighbor” non-EOP students to perform, had they been admitted with similar admission scores but not given EOP program services (a counterfactual scenario).

In their first semester of college, non-EOP students were represented in greater numbers (45%) on the Dean’s list than EOP students (21.5%), $OR = .334$ (.213 - .525), $p = .000$ (see Appendix A,

Table 3). The odds of non-EOP students earning Dean's list status were greater than 2:3, whereas the odds of EOP students earning such status were approximately 1:4. Among non-EOP students, with each standard deviation increase in admission score, the likelihood of achieving Dean's list status doubled: OR = 2.114 (1.708 – 2.615), $p = .000$. Among EOP students, with each standard deviation increase in admission score, the likelihood of achieving Dean's list status increased by approximately 60%: OR = 1.570 (.958 – 2.573), $p = .073$ (see Appendix B, Figure 2). EOP students from African-American and/or Latino/a backgrounds had about half of the odds of non-EOP students from African-American and/or Latino/a backgrounds (37.1%, $n = 43$) of earning a spot on the Dean's list (23.5%, $n = 23$), OR = .521 (.286 - .949), $p = .033$. When the average EOP admission score was entered into the non-EOP model, we found that EOP students, on average, had about the same probability of earning Dean's list status during their first semester as non-EOP students whose admissions scores were essentially at the admissions cut off (+.03 *SD*).

In their first semester of college, students in EOP were more than twice as likely to be placed on academic probation (8.3%, $n = 10$) as students who did not participate in the program (3.8%, $n = 37$), OR = 2.257 (1.092 - 4.664), $p = .028$. Among non-EOP students, with each standard deviation increase in admission score, the likelihood of being placed on academic probation was reduced by approximately half: OR = .467 (.265 - .823), $p = .008$. Among EOP students, higher admission scores did not have a discernible effect on first semester academic probation status, OR = 1.209 (.594 – 2.461), $p = .601$ (see Appendix B, Figure 3). Despite entering college at far greater academic disadvantage, EOP students, on average, had about the same probability of being placed on academic probation as non-EOP students somewhat above (+.21 *SD*) the admission score cut-off. Among non-EOP students, 8.6% ($n = 10$) of those identifying as African-American and/or Latino/a were placed on academic probation during their first semester of college. When we narrowed our analysis to the 214 students identifying as African-American and/or Latino/a, we did not find a statistically significant difference in proportions of students placed on academic probation following the

first semester between EOP students and non-EOP students, $OR = .691 (.242 - 1.975)$, $p = .491$.

First semester credits earned and credits earned/attempted ratio. Prototypical EOP students earned $-.578$ standardized credits during their first semester in school, equivalent to a mean of $12.72 (SD = 2.82)$ credits whereas prototypical non-EOP students, on average, earned $.072$ standardized credits during the same semester, equivalent to a mean of $14.364 (SD = 2.254)$ credits. Prototypical EOP students therefore earned $.67 SD$ fewer credits than non-EOP students, a difference of approximately 1.5 credits, $t(1083) = 2.009$, $p = .000$. While EOP students were shy of a full credit semester (15 credits) by more than 2 credits, prototypical non-EOP students were only about half of a credit shy. This difference in first semester credits earned was partly attributable to EOP students attempting fewer credits, $M = 14.339 (SD = 14.339)$ than non-EOP students, $M = 15.352 (SD = 1.273)$, $t(1083) = 8.094$, $p = .000$.

Among non-EOP students who identified as African-American and/or Latino/a, first-semester number of credits earned ($-.085$, standardized, on average; equivalent to $13.97, SD = 2.89$) was much closer to the number of credits earned by other non-EOP students (only about half of a credit lower) than to the number of credits earned by EOP students who identify as African-American and/or Latino/a. On average, EOP students from African-American and/or Latino/a backgrounds earned 1.25 credits fewer credits ($-.49 SD$) than non-EOP students from African-American and/or Latino/a backgrounds. According to the results of separate multiple regression analyses for EOP and non-EOP students, admission score was a statistically significant predictor of first-semester credits earned (see Appendix A, Table 4). A comparison of these models demonstrates that EOP students from African-American and/or Latino/a backgrounds earned a similar number of credits, on average, to the number we would expect non-EOP students from African-American and/or Latino/a backgrounds (“nearest neighbors”) to earn if they had been admitted to the college with similar admission scores to EOP students yet not provided with EOP support services (a counterfactual scenario).

A smaller proportion of EOP students, 60.3% ($n = 73$), earned all credits attempted during their first semester than non-EOP students, 77.5% ($n = 747$), $OR = .442 (.296 - .655)$, $p = .000$ (see Appendix A, Table 5), further contributing the observed difference in credits earned. The odds of an EOP student completing all credits attempted was approximately 3:2, whereas the odds of a non-EOP student completing all credits attempted was 7:2. Therefore, EOP students had less than half the odds of completing all credits attempted as non-EOP students. With each SD increase in admission score, the odds of EOP students earning all credits attempted in the first semester improved by 60%, $OR = 1.601 (1.048 - 2.445)$, $p = .034$. With each SD increase in admission score, the odds of non-EOP students earning all credits attempted increased by 78%: $OR = 1.782 (1.381 - 2.300)$, $p = .000$ (see Appendix B, Figure 4). When we entered the mean admission score of EOP students into this non-EOP model, we found that EOP students had about the same probability of completing all credits attempted in their first semester as non-EOP students with an admission score $.77 SD$ above their own ($.5 SD$ below the admissions score cut-off).

Among non-EOP students, a smaller proportion of African-American/Latino/a students, 69.8% ($n = 81$), earned all credits attempted (odds of approximately 7:3) than the proportion of non-EOP students who were neither African-American nor Latino/a, 78.5% ($n = 666$; odds of approximately 2:1), $OR = .632 (.412 - .971)$, $p = .036$. The odds non-EOP students from African-American and/or Latino/a backgrounds earning all credits attempted were therefore about 37% lower than those of other non-EOP students. EOP students from African-American and/or Latino/a backgrounds, on average, had a somewhat lower rate, 62.2% ($n = 61$) of completing all credits attempted than their non-EOP counterparts from African-American and/or Latino/a backgrounds, 69.8% ($n = 81$): $OR = .712 (.403 - 1.259)$, $p = .243$.

First-Year Continuous Enrollment and Retention Outcomes

Nearly equivalent proportions of EOP (95.9%) and non-EOP (94.7%) students were continuously enrolled for their first and second semesters of their first year in college, $OR = 1.296 (.507 - 3.313)$, $p = .588$ (see Appendix A, Table 6). EOP students also were

found to have the same continuous enrollment rate as that predicted for non-EOP students who were 1.46 *SDs* above the cut-off for admission, on average. Thus, continuous enrollment rates among EOP students were consistent with continuous enrollment rates among non-EOP students with the highest admission scores. Among non-EOP students, admission score was related to the probability of being continuously enrolled, in that for each *SD* increase in admission score, the likelihood of continuous enrollment increased by 59%: OR = 1.593 (.999 – 2.541), $p = .050$ (see Appendix B, Figure 5). Among EOP students, the probability of continuous enrollment was not associated in a statistically significant manner with higher admission scores, OR = .763 (.285 – 2.043), $p = .590$. Furthermore, no statistically significant differences were found between proportions of students continuously enrolled when non-EOP students from African-American and/or Latino/a backgrounds (94.8%) were compared to: (1) non-EOP students from other backgrounds (94.7%) and (2) EOP students from African-American and/or Latino/a backgrounds (96.9%).

Along the same lines, nearly equivalent proportions of EOP (86%, $n = 104$) and non-EOP (86.8%, $n = 837$) students returned to college in the fall of their second year, OR = .928 (.538 - 1.602), $p = .789$ (see Table 6 in Appendix A). Furthermore, EOP students had the same retention rate, on average, as that predicted for non-EOP students with admission scores that were .78 *SD* above the cut-off for admission (see Appendix B, Figure 6). As above, no statistically significant differences were found between groups when non-EOP students from African-American and/or Latino/a backgrounds (82.8%) were compared to: (1) non-EOP students from other backgrounds (87.4%) and (2) EOP students from African-American and/or Latino/a backgrounds (86.7%).

Stop-out and Transfer Status at Follow-Up

Among the 17 EOP students (14%) and the 127 non-EOP students (13.2%) who were not retained following their first year, similarly small percentages of EOP students (2.5%, $n = 3$) and non-EOP students (1.9%, $n = 18$) were categorized as “stop-outs,” defined in this study as students who neither returned after the first semester of the second year nor enrolled in another institution

by what would have been their fourth year of school. Logistic regression analyses were carried out to examine differences in transfer status (two-year vs. four-year institution) between program and non-program participants who enrolled in another institution by what would have been their fourth year of school. Transfer status information was gathered via the National Student Clearinghouse Student Tracker program.

Similar proportions of EOP students (9.1%, $n = 11$) and non-EOP students (8.6%, $n = 83$) who did not return to the college where this study took place for the first semester of their second year transferred to another institution by what would have been their fourth year of college, $OR = 1.069 (.552 - 2.069)$, $p = .843$. EOP students who transferred had an almost 1.5 SDs lower first semester GPA, approximately the difference between a C- and a B-. This group of EOP students also earned about 2 SDs fewer credits during their first semester, on average (55% of a full-credit load/8.5 credits), than non-EOP students (91% of a full-credit load/13.65 credits).

Correspondingly, as shown in Table 7 (Appendix A), the proportion of EOP students who transferred to another bachelor-degree granting institution by the fall of what would have been their fourth year of college was far lower (18%, $n = 2$) than that of non-EOP students (76%, $n = 63$), with EOP students having about 93% lower odds: $OR = .071 (.014 - .354)$, $p = .001$. Rather, EOP students who transferred out of the institution where this research took place were far more likely (92%, $n = 11$) to enroll in a community college than non-EOP students (24%, $n = 20$). While this pattern of results is quite clear, EOP cell sizes for these outcomes were particularly small. Therefore, the OR reported here should be interpreted cautiously.

Discussion

The goal of the current study was to examine the extent to which the EOP program at a selective four-year public comprehensive college contributed to achievement, persistence, and retention among students from underrepresented backgrounds who were admitted and provided support via a provisional admission policy. In terms of improving access, the EOP program doubled

the number of students from first-generation backgrounds and substantially increased the number of students from low-income and African-American and/or Latino/a backgrounds on campus, thereby contributing to the increased diversity of the student body. Hurtado and Ruiz (2012) have observed direct associations between cultural diversity, more welcoming climates, and improved intergroup relationships on campus. Thus, benefits of improving access to higher education to students from underrepresented backgrounds are likely to extend beyond support services and to the college community at large.

Two distinct patterns emerged in our results. The first pattern indicated domains in which EOP students exhibited outcomes that appeared to “close the gap” and set the stage early in their college career for bachelor’s degree attainment. These included first-semester GPA, continuous enrollment during the first year, and first-year retention levels comparable to those of typical non-EOP students. EOP students also had Dean’s list status and academic probation status rates that were comparable to non-EOP students at or above the admissions cut-off. In each of these domains, average EOP values exceeded the counterfactual values that would be expected for non-EOP students, had non-EOP students been admitted with comparable admission scores to the EOP students. Such findings are not trivial, particularly when we consider the much lower likelihood that EOP students entered the institution with experiences of college-level coursework, and the fact that EOP students would not be enrolled at the college without the EOP program’s existence and support. Given that EOP students, on average, enter college with far greater educational and social disadvantages, these results provide solid quantitative evidence that the program is working.

The other pattern revealed domains in which disparities persisted that had the potential to pose unique challenges to timely graduation among EOP students. Consistent with equity gaps reported by the College Board (2014), EOP students were about half as likely to enter college with college course credits as non-EOP students. Aside from the academic preparation benefits of prior college-level course experience, “extra” college credits provide students with more flexibility/choice to drop or withdraw from

courses or to take a lower course load during selected semesters en route to graduation. This observation is particularly noteworthy given that EOP students were less likely than non-EOP students to earn all credits attempted during the first semester, a finding in line with national data on first-generation college students (see Chen, 2005). Students risk losing financial aid when their ratio of credits earned to credits attempted falls too low. For low-income students, loss of financial aid is equivalent to loss of college access.

When we examined transfer outcomes at what would have been the fourth year of college among the small proportion of students who were not retained following their freshman year, a quite significant disparity was observed. EOP students who left tended to transfer to community colleges, whereas non-EOP students tended to transfer to bachelor's degree granting institutions (non-EOP students from African-American and/or Latino/a backgrounds were in the middle). EOP students who continued their studies in a community college setting tended to have struggled academically during their transition to college.

Strengths of this study include a method of analysis that allowed for precise measurements of the extent to which initial educational disparities were reduced post-college entry and the use of the National Student Clearinghouse Student Tracker program to gather persistence data for students who were not retained following their initial year of college. Limitations included insufficient power to detect differences in outcomes between: (a) students from African-American backgrounds and students from Latino/a backgrounds; (b) EOP students from African-American backgrounds and/or Latino/a backgrounds and a much smaller group of EOP students who identified as Caucasian and/or Asian (despite better academic preparation indicators, the latter group appeared to have less successful achievement and retention outcomes); and (c) male and female students within EOP. Furthermore, we did not examine EOP and non-EOP group differences with regard to first-semester courses taken and patterns of course withdrawal. Results from such an examination could potentially shed light on the role that these factors played in EOP student success during the college transition. Stronger evidence for program effectiveness would result if functional

equivalence across EOP and non-EOP student outcomes could be demonstrated (see Rodgers, Howard, & Vessey, 1993). Further research in this area should use educationally-relevant degrees of functional difference that are defined by policy-makers and/or stakeholders as a basis for such analyses.

Based on the results reported above, we recommend that EOP students and struggling non-EOP students from low-income backgrounds be provided with additional time and resources to fulfill course requirements. With financial aid for summer opportunities to increase the number of credits earned, students can gain additional momentum towards graduation (Attewell, Heil, & Reisel, 2012). Recent revision to PELL grants as of May of 2017 (see https://www.nasfaa.org/legislative_tracker_pell_grants) allow for year-round aid to students from low-income backgrounds, a hopeful step in this direction. For students who leave for community colleges, perhaps program counselors could maintain contact and offer an invitation to return in the future, contingent upon a satisfactory academic record at the transfer institution. We also can envision additional outreach and support for students from African-American and/or Latino/a backgrounds who are not eligible for the kinds of support provided by a provisional admission program, as results reported here indicate that students from these backgrounds were more likely to transfer to community colleges (vs. bachelor-degree granting institutions) than other non-EOP students.

Future research will examine similarities and differences in outcomes between EOP and non-EOP program participants across subsequent semesters. We also will examine graduation rates among this cohort at six-year follow-up, both from the current institution and from institutions to which the students have transferred. Plausible mechanisms (e.g., increased sense of belonging, mastery of student role, utilization of academic support services on campus) by which the program contributes to student achievement and retention will be investigated.

Douglass and Thomson (2012) describe the historical mission of public universities to educate students from a wide range of backgrounds as “a formal mandate or social contract” (p. 68). The combination of access and support provided by provisional

admission programs such as EOP, along with the renewed federal commitment to year-round PELL grants that support academic momentum and reduce disparities in academic attainment (see Attewell et al., 2012) have the potential to help fulfill this social contract.

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Appendices

Appendix A: Tables

Table 1

Background Characteristics by Program Participation

Program Participation	PELL Status, Count (%)	
	PELL	Non-PELL
EOP	121 (100%)	0 (0%)
Non-EOP	178 (18.5%)	786 (81.5%)
Total	299 (27.6%)	786 (72.4%)
	First-Generation Status, Count (%)	
	First-Generation	Non-First-Generation
EOP	109 (90.1%)	12 (9.9%)
Non-EOP	67 (7%)	897 (93%)
Total	176 (16.2%)	909 (83.8%)
	Cultural Background, Count (%)	
	African-American and/or Latino	Other Cultural Background
EOP	98 (81%)	23 (19%)
Non-EOP	116 (12%)	848 (88%)
Total	214 (19.7%)	871 (80.3%)

Table 2
First-Semester GPA

Predictors	First Semester GPA			
	EOP		Non-EOP	
	<i>B</i> (SE)	<i>p</i> -value	<i>B</i> (SE)	<i>p</i> -value
Intercept	-1.343 (.393)	.001	.106 (.045)	.019
Admissions Score	.230 (.111)	.039	.309 (.037)	.000
Gender	-.288 (.211)	.173	-.328 (.060)	.000
Low-Income	---	---	-.036 (.076)	.632
African American or Latino/a	.661 (.252)	.009	-.082 (.088)	.352
First-Generation College Student	1.046 (.323)	.001	.255 (.102)	.012
	$R^2 = .161$		$R^2 = .115$	

Note. Female, non-low-income, non-first-generation college students from Caucasian and Asian backgrounds were the reference group. Because all EOP students received federal PELL grants, low-income was not included as a predictor in regression models for EOP students.

Table 3
Dean's List and Academic Warning

	Count (Percentage)		OR	<i>p</i> -value	95% CI
	EOP (<i>N</i> = 121)	Non-EOP (<i>N</i> = 964)			
Dean's List	434 (45%)	26 (21.5%)	.334	.000	.213 - .525
Academic Warning	10 (8.3%)	37 (3.8%)	2.257	.028	1.092 - 4.664

Note. Among non-EOP students from African-American and/or Latino/a backgrounds, 8.6% ($n = 10$) were placed on academic probation.

Table 4
First-Semester Credits Earned

Predictors	Fall Credits Earned			
	EOP		Non-EOP	
	<i>B</i> (SE)	<i>p</i> -value	<i>B</i> (SE)	<i>p</i> -value
Intercept	-1.209 (.459)	.008	.122 (.046)	.007
Admissions Score	.319 (.130)	.014	.122 (.057)	.032
Gender	-.319 (.246)	.196	-.240 (.057)	.000
Low-Income	---	---	.115 (.076)	.131
African American or Latino/a	.702 (.294)	.017	-.209 (.093)	.025
First-Generation College Student	.765 (.377)	.043	.208 (.118)	.078
Interaction: Admissions x Gender	---	---	.186 (.092)	.045
	R ² = .125		R ² = .047	

Note. Female, non-low-income, non-first-generation college students from Caucasian and Asian backgrounds were the reference group. Because all EOP students received federal PELL grants, low-income was not included as a predictor in regression models for EOP students.

Table 5
All Credits Earned/ Attempted, First Semester;

	Count (Percentage)		OR	<i>p</i> -value	95% CI
	EOP (<i>N</i> = 121)	Non-EOP (<i>N</i> = 964)			
All credits earned/ attempted	73 (60.3%)	747 (75.5%)	.442	.000	.296 - .655

Note. Among non-EOP students from African-American and/or Latino/a backgrounds, 81 (69.8%) earned all credits attempted.

Table 6*First-Year Continuous Enrollment and Retention*

	Count (Percentage)		OR	p-value	95% CI
	EOP (N = 121)	Non-EOP (N = 964)			
Retention	104 (86%)	837 (86.8%)	.928	.789	.538 - 1.602
Continuous Enrollment	116 (95.9%)	913 (94.7%)	1.296	.588	.507 - 3.313

Table 7*Transfer College (2-Year vs. 4-Year)*

	Count (Percentage)		OR	p-value	95% CI
	EOP (N = 11)	Non-EOP (N = 83)			
2-Year College	9 (82%)	20 (24%)			
4-Year College	2 (18%)	63 (76%)	.071	.001	.014 - .354

Appendix B: Figures

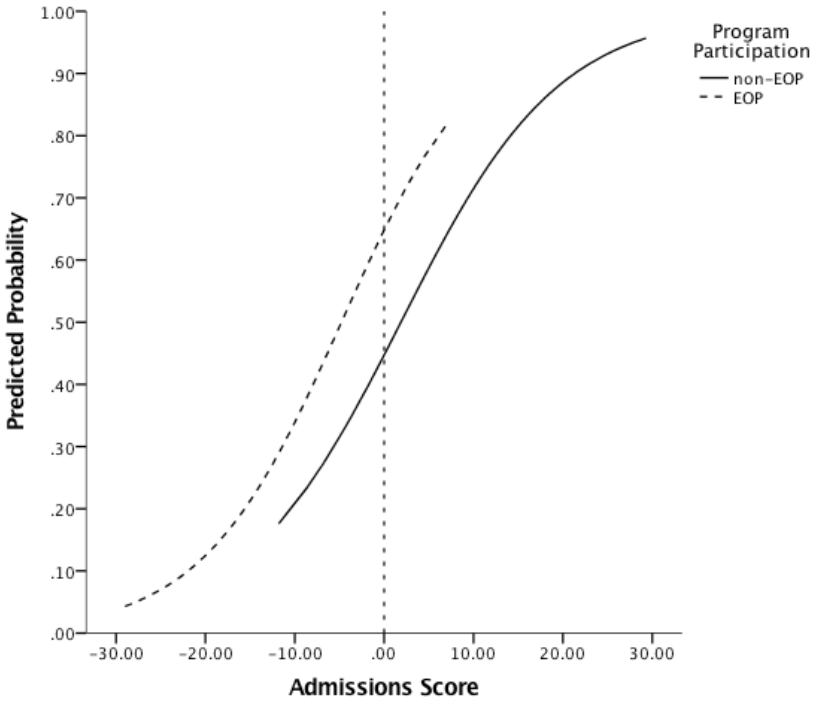


Figure 1. Predicted probability of entering the institution with college credits by admission score (centered at cut-off) and program participation.

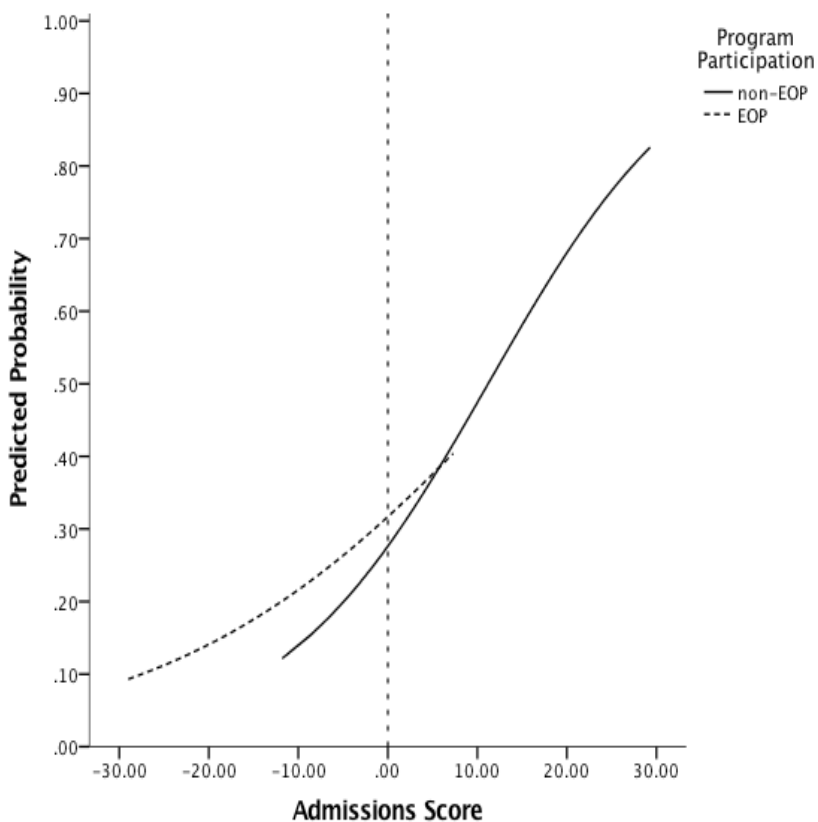


Figure 2. Predicted probability of earning Dean's list status during first semester by admission score (centered at cut-off) and program participation.

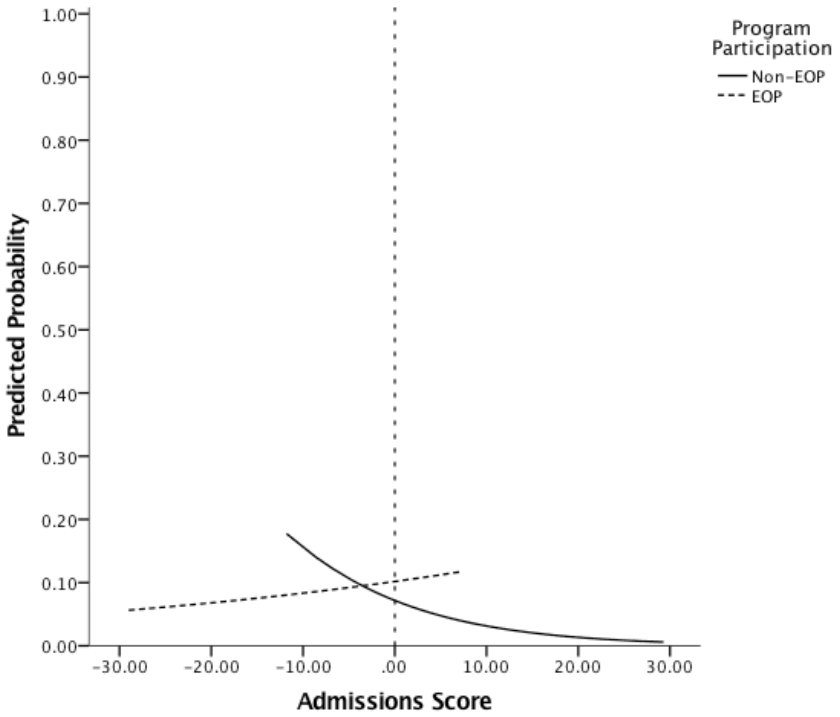


Figure 3. Predicted probability of academic probation status during the first semester relative to admission score (centered at cut-off) and program participation.

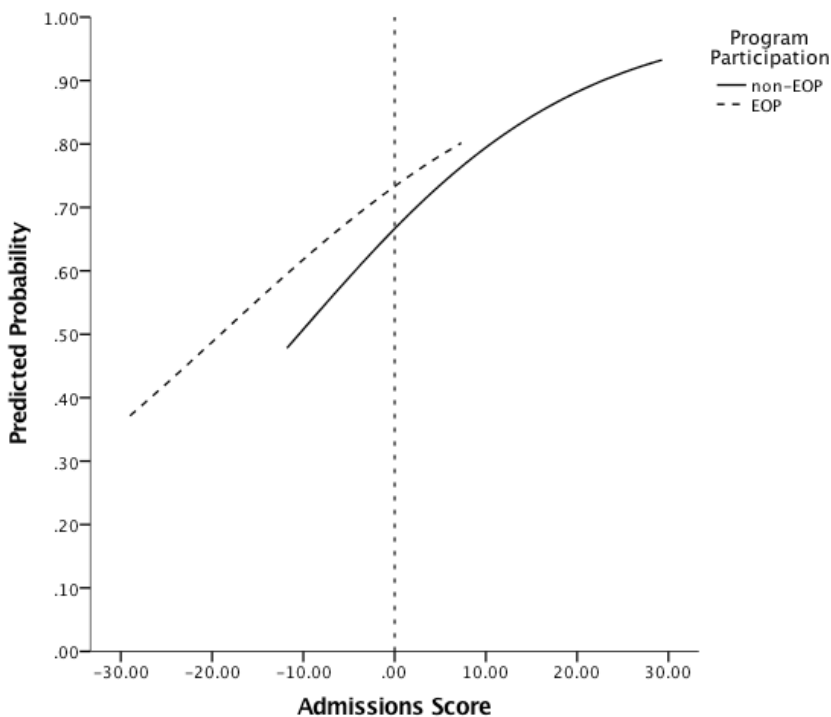


Figure 4. Predicted probability of earning all credits attempted by admission score (centered at cut-off) and program participation.

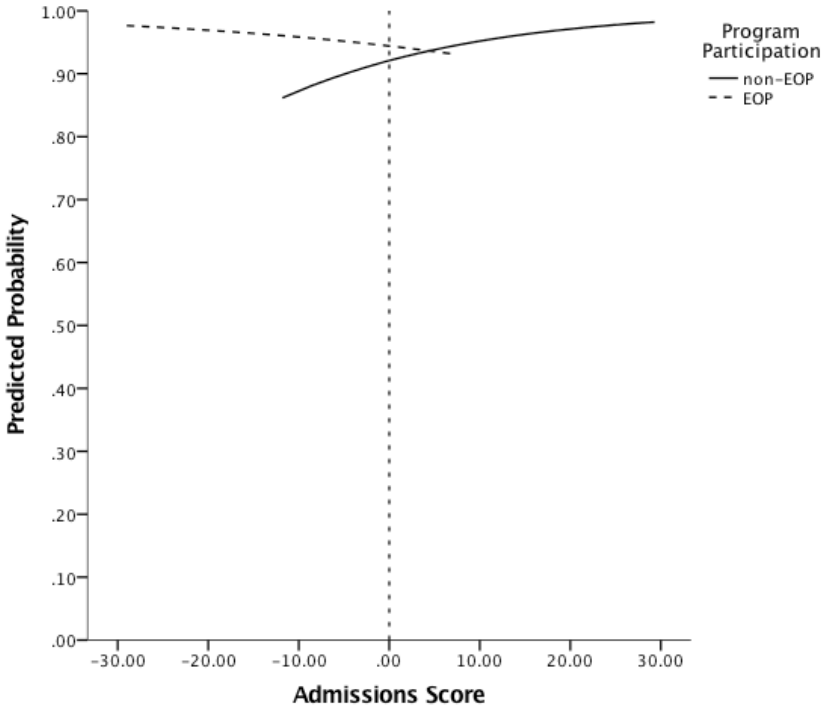


Figure 5. Predicted probability of continuous enrollment by admission score (centered at cut-off) and program participation.

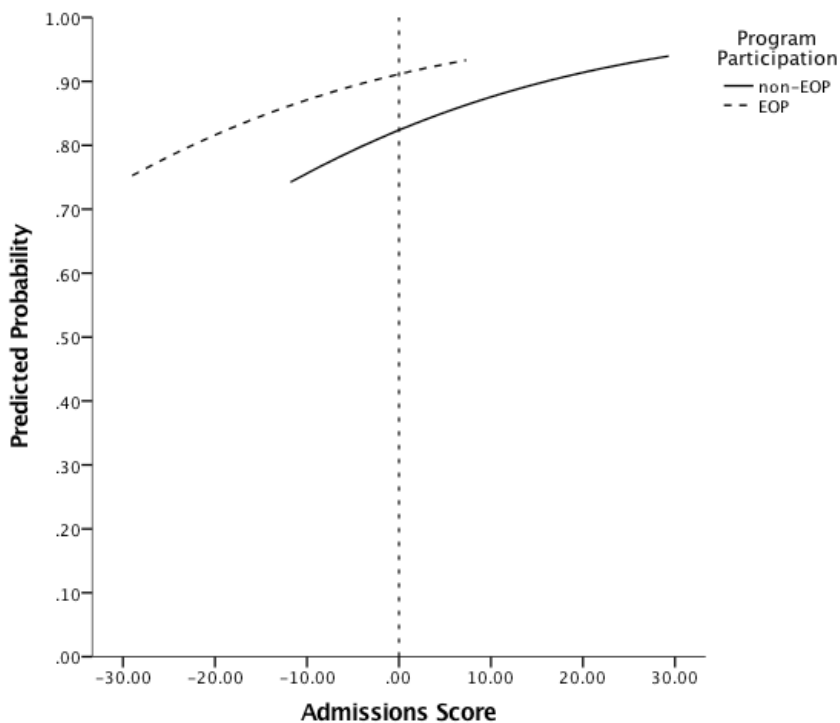


Figure 6. Predicted probability of first year retention by admission score (centered at cut-off) and program participation.

Bridging the Supplemental Instruction Leader Experience and Post-Graduation Life

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Abstract

This qualitative case study explores the experiences of former SI leaders who worked at a four-year, private university in the Mid-Atlantic while completing their undergraduate degrees. The insights offered by participants through interviews and graphic elicitation reveal the ways in which serving as an SI leader prepares students for their post-graduation lives through the transferability of skills. This study also seeks to fill a void in research, as studies on academic assistance programs tend to explore benefits for student participants, such as increased retention and course grades, but fail to explore the development of the programs' student leaders.

Bridging the Supplemental Instruction Leader Experience and Post-Graduation Life

The role of higher education continues to be questioned in today's society due to the lack of engaged American citizenry and the rising cost of a college degree (AASCU, 2017).

According to former college president Brian C. Mitchell, the case for American higher education “shouldn't abandon the idea that colleges exist to educate broadly and to prepare people to be productive citizens—but it also must recognize that students and families do want postsecondary education and training to prepare them for career success” (Lederman, 2017, para. 5). Therefore, in addition to educating, institutions of higher education must provide students the opportunity to develop skillsets that are most desirable by future employers. The National Association of College and University Business Officers has coined this concept “a new way of articulating the value of higher education” (para. 15).

Results from the National Association of Colleges and Employers' (NACE) (2017) *Job Outlook 2016* survey found that more than 80 percent of employers intentionally seek to hire "leaders who can work as part of a team" (n. p.). In addition to academic major and GPA, employers cite graduates' participation in leadership roles as having a significant influence on hiring decisions (NACE, 2017). Studies that focus on the intersection of civic engagement and student leadership in higher education found that students who are engaged in leadership opportunities during their undergraduate years demonstrate improved academic performance, critical thinking skills, communication, and leadership qualities that are transferable to real-world settings, such as post-graduate school and future employment (Cress et al., 2010).

Broadly, student leadership is defined as "students who have been selected and trained to offer educational services to their peers [that] are intentionally designed to assist in the adjustment, satisfaction, and persistence of students toward the attainment of their educational goals" (Ender & Kay, 2001, p. 1). Student leadership within the realm of peer-facilitated academic assistance programs has a long tradition in higher education and has proven successful in promoting student success. (Ning & Downing, 2010). Student leaders "effectively serve as a bridge between course 'experts' with extensive content knowledge and the lived experience of the student body," thus truly functioning as facilitators of learning rather than sources of knowledge (Sloan, Davila, & Malbon, 2013, p. 86). The role of the student leader, in this sense, supports the constructivist paradigm, which serves as the theoretical foundation for all peer-assisted learning. In this framework, student leaders as facilitators assist their peers in constructing their own knowledge rather than merely providing answers, which places the responsibility of learning back on the students themselves (Ning & Downing, 2010). One example of an academic assistance program that fosters peer-assisted learning is Supplemental Instruction.

Supplemental Instruction, or SI, is a free, peer-facilitated academic assistance program developed in 1973 by Dr. Deanna Martin at the University of Missouri-Kansas City with the overall goal of identifying and supporting the most challenging courses for

students. SI sessions are regularly-scheduled, informal review sessions that involve collaborative learning activities through which students can clarify course concepts and practice the types of study strategies that will help them truly master the information and skills required by the target course (Congos & Stout, 2003). The sessions are facilitated by SI leaders—students who have previously done well in the course and who attend all class lectures, take notes, work closely with faculty, and act as model students. Studies have shown that students who attend SI earn higher mean final course grades and graduate at a higher rate than those who do not attend (Hurley, Jacobs, & Gilbert, 2006).

While the majority of research on SI examines increases in participants' course grades and the positive effects the program has on students who attend sessions, few studies set out to examine the additional benefits of the program for the student leaders who are responsible for facilitating the sessions, which may result in increased preparation for future professional and academic aspirations (Lockie & Van Lanen, 2008; Malm, Bryngfors, & Morner, 2012; Skalicky & Caney, 2010; Stout & McDaniel, 2006). These perceived benefits of SI are not widely explored, which is why this qualitative case study seeks to uncover additional insight regarding how the SI leaders' experiences are transferable to their future career and academic goals.

Background

The determination of the college years as a critical period for students' growth has led institutions of higher education to extend learning outside of the classroom in an effort to enrich the overall college experience (Logue, Hutchens, & Hector, 2005). This type of experiential learning is referred to by the Association of American Colleges and Universities (AACU) (2011) as “integrative and applied learning” and has been named one of the four essential learning outcomes of higher education for the twenty-first century (p. 7). One specific area of renewed focus has been on increasing peer leadership opportunities for students.

Studies in the field of peer-led academic support programs explore student leadership as a component of integrative and applied learning (Shook & Keup, 2012; Logue, Hutchens, & Hector, 2005).

Peer-facilitated learning has deep roots in higher education as a means for promoting student learning; collective sense-making and problem-solving among peers foster a sense of belongingness for students and promotes the social and cultural constructivist nature of learning itself (Ning & Downing, 2010). The role of the student leader in any type of peer-led academic assistance program, including SI, is that of a facilitator, assisting learners in the processing, comprehension, and construction of their own knowledge, with the ultimate goal of mutually transforming both their students and themselves into independent learners (Ning & Downing, 2010).

Examination of the current literature on SI programs in regard to student leader development yielded limited results. Most widely cited is a literature review conducted by Stout and McDaniel (2006), which reveals that benefits for SI leaders, in particular, include the following: increased understanding of the course material; improved communication skills; enhanced interactions with faculty, students, and other SI leaders; enhanced personal development; and professional development. Additionally, Malm, Bryngfors, and Morner (2012) explored if serving as an SI leader has had any merit in terms of applying for future employment and if any skills learned as a result of the SI program are transferable to a professional setting post-graduation. Such research has found that students develop the following skills as a result of their SI experience: improved communication skills, the ability to organize collaborative learning groups, a deeper understanding of course content, improved self-confidence, and increased security in a leadership role, all of which are desirable by future employers.

Practical skills notwithstanding, these “‘soft’ social skills and cultural lessons have plenty of value. . . . Employers want people who can write, who can intuit what others are thinking, who can learn from others,” all skills that have become critical “in an economy that is based more and more on social relationships” (Carlson, 2013, n. p.). Therefore, it is necessary to identify ways in which students are gaining practical and social skills during their undergraduate experience, both inside and outside of the classroom, that make them desirable to future employers and prepared for post-graduate academic programs (Peck, et al., 2015). For this reason, the purpose

of the current study is to explore how former SI leaders describe the impact of serving in leadership roles during their undergraduate study and the ways in which they have applied their experiences to their post-graduation lives.

Method

A particularistic case study methodology was chosen for this study to explore how serving as an SI leader prepares students for their post-graduation lives through the transferability of skills. The unit of analysis was a group of former SI leaders who worked in an SI program at a four-year, private university in the Mid-Atlantic.

Context

The university that serves as the context for this study is a private comprehensive, coeducational institution that offers nearly 60 undergraduate and graduate degree programs to approximately 6,000 students, located in the Mid-Atlantic region of the United States. The SI program began as a pilot in fall 2010 to fill a void in academic support services provided by the university to better support historically difficult introductory courses with a DFW rate of at least 20 percent. At the time of data collection, the SI program supported over 60 course sections across multiple disciplines, including biology, chemistry, physics, and accounting, with a staff of 30 SI leaders.

Participants

An SI leader is defined as an undergraduate student (sophomore level or higher) who has successfully completed the SI-participating course with a B grade or better, has a 3.2 or higher cumulative grade point average, has been recommended by a faculty member, sits in course lectures with current students, and facilitates collaborative review sessions outside of the classroom three times per week for all students enrolled in the targeted course. This study concentrated on the experiences of former SI leaders who previously served in the role for at least one year while completing their undergraduate study.

Since SI leaders facilitate sessions across a variety of disciplines, participants were selected through purposeful maximum variation sampling in an effort to capture the heterogeneity of the SI leader population and to ensure that participant responses satisfactorily

represented the range of SI leaders employed by the program (Patton, 2002). Twenty-two of the 31 former SI leaders who met the criteria for the study volunteered to participate. Six of the 22 participants were male, and 16 were female. The participants ranged in age from 21 to 32 at the time of the study. Four participants worked as an SI leader for one year; seven participants served in the role for two years; two participants worked two-and-a-half years; and nine participants maintained the position for three years. Participants ranged from two months to six years post-graduation (see Appendix A). To ensure the confidentiality of respondents, each participant was assigned a pseudonym of which only the researchers were privy.

Procedure

Interviews. Data collection methods chosen for the current study included both individual interviewing and graphic elicitation. A semi-structured, open-ended interview design was employed to allow the former SI leader participants to share as much information as they liked and to fully express their experiences given the nature of the open-ended questions. In addition, this design allowed for follow-up, probing questions when additional information was desired (Turner, 2010; Creswell, 2007). Participants were provided a document of informed consent prior to the start of each interview that stated the nature and purpose of the study, the confidentiality of their responses, the duration of the interview, and how their participation would benefit future student leaders. Participants were also informed that they could decline to answer any of the questions posed by the interviewer and choose to provide as little or as much detailed information as they would like in response to each question. The full protocol can be found in the appendices.

Each interview lasted approximately 30-60 minutes in duration and was audio-recorded (Creswell, 2014). The interviews began with neutral, descriptive information regarding the participant's history with the SI program and continued toward a more conversational format that allowed the former SI leader to describe and interpret his or her own experiences while serving in a student leadership role (Merriam, 2007; Rubin & Rubin, 2012). Through open-ended questioning, respondents had the opportunity to elaborate on their own unique experiences and anecdotes while working as an SI leader, which provided deeper description for data analysis.

Graphic elicitation. At the conclusion of each interview, participants were provided with a graphic elicitation instrument in the form of a participatory diagram and were asked to depict, whether through words or a visual representation, how they conceptualized their leadership role. The inclusion of graphic elicitation in the form of participatory diagramming allowed the respondents an additional opportunity to interpret their own experiences while serving as SI leaders during their undergraduate study. Graphic elicitations are particularly useful when implemented as complementary to another data collection approach, such as interviewing (Copeland & Agosto, 2012). Given the abstract nature of the experience of the SI leader, graphic elicitations assisted in further defining the participants' perceptions of their role after the conclusion of their interviews. The full protocol may be found in the appendices.

Data Analysis

This study employed single-case data analysis that was both inductive and deductive. The analysis of collected data was continuous as data collection and analysis occur simultaneously in qualitative research. During the first cycle of data analysis, the researchers used a combination of process coding and in vivo coding to summarize basic topics of passages as well as to reference particular phrases that came up repeatedly throughout the participants' responses in an effort to create a preliminary categorized inventory of the data's contents (Saldaña, 2016). Through a second cycle of data analysis, the researchers implemented pattern coding, which is "explanatory or inferential" and seeks to "identify an emergent theme" among data (Saldaña, 2016, p. 236). Each preliminary code was clustered together with similar codes in an outline form, which resulted in a list of tentative category names.

In addition, during this second phase, the researchers analyzed the participants' graphic elicitation diagrams for triangulation purposes to determine if any consistent themes were present across the multiple forms of data retrieved for the study. The researchers also extracted passages within both participants' interview responses and graphic elicitation diagrams that exemplified a particular code and recoded the data based on any new emergent SI themes that arose. After the data analysis concluded, four final themes remained as presented below.

Results

When asked to reflect on how their SI leader experience has impacted their lives beyond graduation, participants discussed how the skills they developed during their time as an SI leader have transferred to their current, real-world careers and post-graduate work. The skills with the highest level of transferability that emerged from the research were broken down by participants into the following categories: knowledge skills, interpersonal skills, communication skills, and collaboration skills.

Knowledge Skills

In terms of knowledge, participants expressed that sitting in lectures as an SI leader offered a great review of the material needed for medical school as well as provided a solid foundation of key content in their chosen disciplines. One participant, Felix, expressed, “It increases your knowledge of the subject that you’re teaching, and for a lot of people, that’s gonna help them later on in their future professions and if they choose to do post-graduate work as well.” Participant Vinnie reaffirmed, “When I finished as an SI leader and I went off to graduate school, it was so much easier for me to apply that information for myself in my program just because I knew it so well from re-learning it to teach it to other people as an SI leader.” Former SI leaders commonly noted that having to teach the material to other people further increased their content knowledge, which made it easier to retain and apply these concepts to their graduate coursework and future professional roles.

Additionally, participants currently enrolled in medical school commented that serving as an SI leader prepared them for the MCAT exam because it kept key content that they would need to know for their future careers, such as anatomy, fresh in their minds, as exemplified by Emily’s response: “It helped me with my MCAT. It helped me even with my interviews for med school, so it definitely took the pressure off and kept the content fresh in my brain, and it’s stuff that I’m gonna need to know forever.” Former SI leaders who pursued teaching assistant positions (TA) in graduate school added that the different techniques they found helpful for their undergraduate students are the same techniques they are using again in their TA sessions. One participant, Victor, specifically credited his

SI leader experience as the criterion that set him apart from his peers when applying for a TA position: “I think it definitely helped me get that TA position during PT school. . . . I think it helped for them to see that I had been in a situation where I was teaching and helping other students, so that definitely played a role for that.” Former SI leaders collectively expressed that their participation in the SI program fostered their passion to become lifelong learners.

Interpersonal Skills

Throughout the interview responses, participants commonly highlighted how the interpersonal skills they gained as a result of their SI leader experience transferred into increased involvement and socialization in their current academic or professional roles. Former SI leaders commented that they were more eager to meet new people and take advantage of on-campus opportunities as soon as they arrived at their current graduate or medical school due to their previous engagement in the SI program during their undergraduate years. As Kandice notes, “Through SI, becoming involved, being able to become more social, meet new people, actually helped me become more social, meet new people, and transfer everything that I learned into my medical school career, so I was able to talk one-on-one with professors and students.” Participants highlighted their increased comfort in their ability to talk one-on-one with faculty, which they attributed to the close faculty relationships they developed through the SI partnership, as well as in their ability to work with individuals different from themselves, which they noted was important when planning to enter a career involved with patient care, as “it makes you comfortable working with other people.”

Communication Skills

Participants pursuing medical degrees further elaborated that aspects of communication that they learned and developed as SI leaders have proven helpful in fostering patience when talking with patients and their families and also when handling difficult situations. For example, participant Simon noted, “I feel like when I talk to patients, families, and things like that, definite aspects of what I’ve learned as an SI leader, they’re very helpful when I interview certain patients.” Participant Sandy expressed, “I think that being an SI leader will definitely help me as a doctor, not only in being patient,

but also with learning how to explain things.” Former SI leaders frequently paralleled their ability to break down complex concepts in easy-to-understand ways for their previous students with their ability to break down similarly complex concepts for their current and future patients, which is helpful when “you’re trying to explain to them in simpler terms what’s wrong with them.”

Collaboration Skills

Former SI leaders also stressed the importance of learning to work as a team in the SI program. Participant Sarah noted that she “gained administrative qualities working with the supervisor, working with faculty, working with students,” which has been transferable to her current position working with peers and supervisors. For medical school students, like Siena, “SI developed critical life skills and how to handle difficult situations and how to work with different people.” She further commented that “going into a workforce is not just about being the best worker; you have to work as a team. In medical school, you have to work with nurses and social workers,” and serving as an SI leader prepared her for that challenge.

In addition to honing valuable skill sets, former SI leaders illustrated in their graphic elicitation diagrams how their experience serving in a peer leadership role during their undergraduate years helped shape their future goals and ambitions, which they are currently pursuing in their post-graduation lives. While some participants already planned on applying to medical school prior to taking on their SI leader role, other participants chose their career path directly as a result of their experience in the SI program. For example, participant Lily never considered a career in education until she became an SI leader: “It shaped my career as a teacher, and it kind of helped me determine that I did want to go into education. I don’t think I would have done that if I didn’t have the opportunity to be an SI leader.” Participants collectively remarked that they were grateful for the professional networking opportunities and transferability of skills that were inherent to their SI leader experiences.

Discussion

This study suggests that serving in a student leadership position fosters the development and transferability of soft skills, particularly those related to interpersonal interactions, communication skills, and collaboration, all of which are cited by U.S. News & World Report as the top soft skills every college student needs (Holmes, 2014). Further, results of this study confirm Hall's (2011) findings that students "see their work experiences as 'a viable way to learn skills that are transferable to other settings,'" such as by enhancing their "ability to work with diverse people, solve problems, communicate effectively, and develop confidence in their leadership skills" (Peck, et al., 2015, p. 3). Since an increasing number of employers seek prospective employees with soft skills that are transferable across multiple disciplines and careers, institutions of higher education should provide additional opportunities for students to develop soft skills during their college experience in preparation for graduation and their subsequent entry into the workforce.

While the traditional "hard" skills taught inside the classroom, such as the application of discipline-specific knowledge, will always be desired in both academic and career domains, soft skills developed outside of the classroom, many of which are exemplified by the student leader experience, are equally prioritized by employers and contribute to the overall mission of higher education. In the current study, former SI leaders noted the ways in which these specific skills have benefited their post-graduate academic experiences as well as their current professional roles and future career aspirations. Through their SI leader experience, participants had the unique opportunity to experience a slice of the real world while still undergraduate students themselves through facilitating review sessions, teaching complex content material, managing others, public speaking, and handling difficult situations, as well as in the involvement, socialization, and networking opportunities inherent to the student leadership role. Such leadership opportunities also provided students the ability to develop, apply, and transfer skills related to self-direction, communication, teamwork, and critical thinking (AACU, 2011). As evidenced by the results of the current study, participants' development of these skills during their undergraduate years has

already proven beneficial to their academic and professional pursuits in their post-graduation lives.

Results of this study also speak to the “return-on-investment” conversation that has infiltrated the space of higher education in recent years in that it connects the skills most desirable by employers to those gained in the outside-of-the-classroom experience of serving as an SI leader (Carlson, 2013). In doing so, however, it also accounts for other benefits associated with higher education, “like college graduates’ tendencies to get more involved in civic and intellectual life” (n. p.). As a result, in addition to bridging the SI leader experience with post-graduation life, this study also bridges both the traditional and “new way of articulating the value of higher education” (Lederman, 2017, para. 15). Therefore, “it is critical, in the current climate, that institutions provide opportunities for student leaders . . . to gain experiences and competencies that will not only make them more well-rounded citizens, but better prepared to enter the workforce and be successful” (Peck, et al., 2015, p. 1).

Consequently, it is encouraged that faculty and administrators who have a vested interest in developing student leaders, as well as a heightened understanding of both the traditional mission and the “new way of articulating the value of higher education,” become advocates both within their own institutions and across colleges and universities in prioritizing the importance of soft skill development through outside-of-the-classroom experiences, such as SI, during their students’ undergraduate years (Lederman, 2017, para. 15). By providing opportunities, like SI positions, for students to work together on problem-solving tasks with practical significance, institutions of higher education will better prepare students “to engage with those who are different from themselves, and to apply what they learn in the classroom to real world settings” (Moore McBride & Mlyn, 2013, p. 3). Peer leadership experiences extend beyond the surface of merely developing desirable skills; these experiences can also provide students an opportunity to integrate these skills in a way that can transform college learners into real-world problem solvers (Rhodes, 2010). This study provides one example of an out-of-the-classroom peer leadership opportunity through which undergraduate students can develop the competencies and skills that will impact their future post-graduate success.

Conclusion

Results from this study attempt to fill the void in research on how SI leaders develop skills that are transferable to their future academic or career aspirations as a result of serving in a peer leadership role in higher education during their undergraduate years. By further exploring this area, program administrators will gain a better sense of how peer leadership positions may serve as a bridge to students' post-graduation lives. In addition, this study provides an alternative for program assessment; rather than just determining that a peer assistance program is, in fact, effective solely based on benefits for program participants, program effectiveness can be further assessed in regard to student success from both angles by uncovering additional program benefits for student leaders.

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Appendices

Appendix A: Participant Demographic Matrix

Participant (by pseudonym)	Age	Gender	Graduation Year	Length of SI Employment	SI Course(s) Facilitated
Gina	28	Female	2011	1 year	Western Civilization
Michael	27	Male	2012	2 years	General Chemistry 1 & 2
Lily	26	Female	2012	2 years	General Chemistry 1 & 2
Siena	25	Female	2014	3 years	General Chemistry 1 & 2
Theresa	25	Female	2014	2 years	Intro to Cell/ Molecular Bio
Kelly	25	Female	2014	3 years	Intro to Cell/ Molecular Bio
Simon	25	Male	2014	2 years	General Chemistry 1 & 2
Caroline	24	Female	2015	3 years	Discovery of Natural Sciences
William	24	Male	2015	3 years	General Chemistry 1 & 2
Kandice	25	Female	2014	2 years	Anatomy & Physiology 1 & 2
Shawn	25	Male	2014	3 years	Anatomy & Physiology 1 & 2, Physics for Life Sciences 1 & 2
Krista	24	Female	2015	2.5 years	Discovery of Natural Sciences,

Participant (by pseudonym)	Age	Gender	Graduation Year	Length of SI	SI Course(s) Facilitated
Allison	23	Female	2015	1 year	Physiology with Anatomy 1 & 2
Emily	22	Female	2017	3 years	Physiology with Anatomy 1 & 2
Felix	22	Male	2017	3 years	Intro to Cell/ Molecular Bio
Sarah	21	Female	January 2017	3 years	Organic Chemistry 1 & 2, General Chemistry 1 & 2, Physiology with Anatomy 1 & 2
Kristin	22	Female	January 2017	2.5 years	Intro to Biodiversity/ Evolution, General Chemistry 1 & 2
Sandy	23	Female	January 2017	1 year	Intro to Cell/ Molecular Bio
Victor	32	Male	2013	1 year	Physiology with Anatomy 1 & 2
Francesca	25	Female	2013	2 years	Financial Accounting
Shae	24	Female	2015	3 years	Discovery of Natural Sciences, Physics for Life Sciences 1 & 2

Appendix B: Interview Protocol

1. When did you graduate from this institution with your undergraduate degree?
2. How would you describe your undergraduate student experience before becoming an SI leader?
3. How would you describe your relationships with faculty and peers before becoming an SI leader?
4. How would you describe your involvement on campus before becoming an SI leader?
5. How long did you serve as an SI leader and for which course(s) did you facilitate SI sessions at this institution?
6. Why did you apply to be an SI leader at this institution?
7. In your opinion, what is the role of an SI leader within the context of this particular institution's SI program?
8. How did serving as an SI leader within this institution's SI program affect your own personal academic achievements (if at all)? Please provide specific examples.
9. How did serving as an SI leader within this institution's SI program influence your involvement on campus while completing your undergraduate study (if at all)? Please provide specific examples.
10. In what ways did serving as an SI leader within this institution's SI program develop your leadership skills (if at all)? Please provide specific examples.
11. How did serving as an SI leader within this institution's SI program foster your relationships with faculty and peers (if at all)? Please provide specific examples.
12. How (if at all) have you changed since your undergraduate years as a result of serving as an SI leader within this institution's SI program? Please provide specific examples.
13. What specific experiences in your role as SI leader within this institution's SI program may have contributed to this change?
14. Would you encourage other students to apply to be an SI leader at this institution? Why? Or why not?

Appendix C: Graphic Elicitation Protocol

Below is a figure of an SI leader. Please represent, whether through visual drawings or written expressions, the responsibilities and relationships of the SI leader and how they are connected to the SI leader's experience, as well as any other aspects of the position that you find relevant.



Impact of Supplemental Instruction Participation on College Freshman Retention

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Abstract

Supplemental Instruction (SI), a higher-education academic support program, targets challenging college courses and uses peer-led review sessions to develop academic skills, improve grades, influence persistence, and ultimately increase student retention (Arendale, 2001). The goals of this study were twofold: to determine if differences existed in prior academic performance of freshman students attending SI sessions while determining whether SI attendance improved retention to the sophomore year. Using quantitative analysis, the researchers found that freshman students with a higher high school GPA were more likely to be retained regardless of SI session attendance. Additionally, freshman students with a lower high school GPA were significantly more likely to be retained if participating in SI sessions. The researchers conclude that SI is an effective program to develop academic skills and yield increased retention. Implications for the profession include a renewed emphasis on increasing SI attendance rate of college freshman students, particularly at-risk students with lower college entrance credentials.

Keywords: supplemental instruction, collaborative learning, cooperative learning, retention, academic support, learning assistance, peer support, persistence, quantitative analysis, at-risk, higher education

Impact of Supplemental Instruction Participation on College Freshman Retention

Supplemental Instruction (SI) is a powerful form of learning assistance that helps students develop academic skills, increase grades, and positively influences retention. The SI model was developed by Dr. Deanna Martin at University of Missouri-Kansas City (UMKC) in 1973 to increase student retention and grades of students in college courses (Hurley, Jacobs, & Gilbert, 2006). The goals of SI programs are to increase graduation rates, reduce attrition rates, and improve grades (Arendale, 2001). The SI sessions merge content delivery with a battery of skills and strategies to improve college student academic performance (Hurley, Jacobs, & Gilbert, 2006). SI sessions provide collaborative learning experiences with peers. These experiences help students learn how to work with others and become independent learners through collaboration (Bruffee, 1993). SI leaders are successful students with numerous responsibilities, including attending class again, taking notes, and planning and delivering multiple weekly collaborative review sessions. The role of the SI leader is to guide and support students in their learning and development by utilizing effective learning strategies and engaging activities; they are not a substitute professor (Arendale, 2001; Hurley, Jacobs, & Gilbert, 2006). SI leaders are hired by a supervisor who trains, selects, monitors, and evaluates their effectiveness (Arendale, 2001).

Iterations of SI models have been adopted at hundreds of higher education institutions internationally, and validated by the U.S. Department of Education as an effective intervention strategy which improves student grades and success rates in historically challenging courses and improves persistence (Arendale, 2001). This research will use theoretical frameworks to view SI through these theory-based lenses: student retention, collaborative learning, and cooperative learning. The researchers also reviewed related literature from investigations of SI models and their impact on student grades and retention.

Components of Student Retention in Supplemental Instruction

Higher education institutions are increasingly held accountable for student retention and graduation by policies such as competitive performance funding as part of state and federal accountability. Many factors influence student persistence and retention. Students are more likely to be successful if held to high expectations, provided support, given assessments and timely feedback, and are engaged (Tinto, 2012). SI sessions influence each of these elements. In particular, SI sessions provide support for high expectations and involve students in a community of learners (Bruffee, 1993). Involvement is a critical component of student learning, growth, and retention (Astin, 1999). Student involvement in SI sessions helps students achieve greater success in the classroom.

Good grades are one of the best predictors of persistence and completion (Pascarella & Terenzini, 2005). One SI program goal is to improve student grades. SI impacts grades and thus influences persistence and retention. Moreover, good grades in the first year of university are important for future collegiate success (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2007). If students attend SI sessions, their grades are likely to increase and they are, consequently, more likely to persist. While SI session activities can improve student learning and grades, peer influence in these activities also plays an important role in persistence.

Research on the influence of SI leader-peers on student development and retention are well documented. Interaction with peers outside the classroom produces cognitive growth and positive gains in writing and thinking. Interaction also improves academic success in the sciences when peer interactions were course-related (Whitt, Edison, Pascarella, Nora, & Terenzini, 1999). Kuh, Kinzie, Buckley, Bridges, and Hayek (2007) assert that involvement with peers positively increases time spent on task which often increases student learning. Moreover, the influence of peers with higher aspirations has a positive effect on retention and persistence (Pascarella & Terenzini, 2005). In addition, first year student attendance in SI sessions results in greater social integration for first-year students, leading to greater persistence (Pascarella & Terenzini, 2005). SI sessions create positive peer influences while maximizing

student development, growth, and persistence through a peer-to-peer cooperative environment.

Collaborative and Cooperative Learning

Collaborative and cooperative learning techniques assist college students in the development of academic skills and content knowledge. Collaborative learning has many benefits, including boosting critical thinking development (Kilgo, Ezell Sheets, & Pascarella, 2015). It also increases cognitive outcomes such as deepened analytical skills and appreciation for fine arts (Cabrera, Nora, Crissman, Terenzini, Bernal, & Pascarella, 2002). Collaborative learning helps students be more involved and apply concepts they are learning (Kuh, Kinzie, Buckley, Bridges & Hayek, 2007). Light (2001) suggests that students who study in groups are more active learners. The collaborative nature of SI sessions may aid in increasing student retention as increased grades and learning are predictors of persistence. Furthermore, team learning integrated into a classroom reduces course drop rates while helping students learn how to work together (Kreie, Headrick, & Steiner, 2007).

Collaborative and cooperative learning should be used to supplement or enhance traditional instruction methods. Gubera and Arugete (2013) advised that collaborative and cooperative methods should accompany, not replace, traditional methods. Kreie, Headrick, and Steiner (2007) found that team learning approaches did not increase student grades, but did decrease course withdrawal rates. They suggested an optimized approach would include cooperative and collaborative approaches blended with varied teaching strategies. SI provides this blended model.

Effectiveness of Supplemental Instruction

Impact on Student Grades

SI has a well-documented, salubrious impact on student grades. SI attendance is positively related to higher grades in variety of courses (Arendale, 2001; Ashwin, 2003; Congos, 2005; Etter, Burmeister, & Elder, 2001; Gattis, 2000; Hensen & Shelley, 2003; Lindsay, Carlsen-Landy, Boaz, & Marshall, 2017; Malm, Bryngfors, Mörner, 2011). Students who attended SI sessions at least three times

had better final exam scores when controlling for a predicted GPA based on their prior academic performance (Kochenour et al., 1997). SI attendance also positively influences performance in future courses if the content and style of the course are similar (Gattis, 2000). Additionally, SI session attendance has been shown to be related to a greater cumulative and term GPA (Oja, 2012). As better grades relate to persistence (Pascarella & Terenzini, 2005), SI attendance influences persistence and consequently, retention, by increasing the grades of college students who attend SI sessions. SI attendance has positively impacted conditionally-admitted or at-risk students, who arrive at universities with learning gaps affecting their readiness to succeed in challenging college courses (Ogden, Thompson, Russell, & Simons, 2003). SI sessions, however, have not always been related to greater course grades. Ogden, Thompson, Russell, and Simons (2003) found no significant impact on traditionally-admitted students attending SI sessions.

Impact on College Student Retention

The impact of SI attendance on retention and persistence is promising. Wilson and Arendale (2011) note that SI focuses not just on at-risk students, but on historically difficult courses. Yet a review of the history of SI provides support that SI can influence at-risk college students. In a study of the impact of a policy requiring SI attendance for conditionally-admitted students, Ramirez (1997) found that at-risk students who attended SI sessions had the highest persistence rates of any admittance group, including both conditionally-admitted and traditionally-admitted college students. Blanc, DeBuhr, and Martin (1983) found that students who attended SI sessions re-enrolled at higher rates for two subsequent semesters. Kochenour et al. (1997) found that students who attended SI sessions were less likely to withdraw from courses. Gattis (2000) found that DFW rates decreased when SI was used as an intervention, and Etter, Burmeister, and Elder (2001) determined that attrition rates were lower for accounting courses following SI implementation. Grillo and Leist (2013) found that use of academic support services including tutoring and SI sessions was related to higher graduation rates. Finally, Bowles, McCoy, and Bates (2008) found SI session attendance increased the probability of graduating when controlling for high

school GPA. The evidence of the impact of SI sessions on retention and graduation is not as clear.

Some researchers have found minimal effects of SI attendance on retention and persistence rates. Using binary logistic regression, Oja (2012) found that persistence rates were similar regardless of SI attendance status for those with a GPA of 1.0 or higher. Additionally, Bowles and Jones (2004) concluded that SI attendance was not a significant predictor of retention when using a model accounting for prior academic performance. Ramirez (1997) found that traditionally-admitted students persisted and were retained regardless of the SI attendance. These studies demonstrate that the effect of SI attendance on retention is mixed. Gattis (2000) states that those who criticize the efficacy of SI claim that improved grades and retention, purported to be related to SI session attendance, may be the result of an undetermined characteristic of the attendee. Some possible explanations for these characteristics relate to prior academic performance or motivation.

Characteristics of Students Attending SI Sessions

SI session attendees might be marginally more motivated, but this characteristic does not explain all grade or retention differences. Blanc, DeBuhr, and Martin (1983) and Arendale (2001) examined the impact of motivation on attendance and performance in an SI program. They controlled for differences in motivation of students by identifying a group of students indicating interest in attending SI sessions at the beginning of the term, but did not attend SI sessions. Blanc, DeBuhr, and Martin (1983) found that motivation to attend sessions did not solely account for grade differences, re-enrollment differences, or differences in term GPA. Malm, Bryngfors, and Mörner (2011) found that SI attendees in a Calculus class were slightly more motivated than non-SI-attendees, were from families with less higher education, and were more comfortable seeking help.

There is discrepancy in the research on the differences in prior academic performance of SI attendees and non-attendees. Bowles and Jones (2004) found significant differences between high school GPA and ACT scores of those attending SI sessions and non-attenders. Bowles and Jones (2004) found that students with greater high school GPAs and those with lower ACT composite

scores attend SI sessions more often. Another study found that SI participants had lower ACT composite scores than non-SI participants (Hensen & Shelley, 2003). Congos (2005) also found that SAT scores were lower for SI attendees, but the students who attended SI sessions still performed better in the course than their peers that did not attend SI sessions. However, an SI model in the UK found that there were no differences in prior academic achievement of students attending sessions and those who did not (Ashwin, 2003). This analysis of related research suggests that the characteristics of students who attend SI sessions may vary by institution. There is a lack of research on SI attendance and college freshmen retention.

Compelling Need for this Study

While the research consistently suggests that SI attendance positively relates to GPA, the relationship between SI attendance and retention and persistence is less evident (Blanc, DeBuhr, & Martin, 1983; Bowles & Jones, 2004; Etter, Burmeister, & Elder, 2001; Kochenour et al., 1997; Ramirez, 1997; Oja, 2012). Additionally, the literature indicates clear differences in SI session-attending students' backgrounds and motivation. This suggests two gaps: how SI session attendance impacts retention and the characteristics of students utilizing SI. This research used quantitative analysis to explore the impact of SI on retention, in particular, freshman retention for the subsequent year. This study also investigated differences in prior academic performance of freshman students attending SI sessions when compared to those who do not.

Research Questions

The researchers investigated two principal research questions:

RQ1. Is there a difference in ACT composite and sub-scores and high school GPA for first-time freshman students when comparing the students who attended SI sessions and those who did not?

RQ2. Is there a difference in subsequent-year retention of first-time freshman students who attend SI sessions and those who do not?

These research questions provide more information on the relationship between SI attendance and student retention and differences between the prior academic achievement of students

given their attendance to SI sessions. These findings may inform the field by providing evidence of the impact of the SI program on student retention.

Methodology

Institutional Characteristics

SI session data were collected at a moderately selective, public, four-year institution in the Midwest with approximately 6,800 enrolled students. At the institution studied, the SI program has been in continuous operation since 1986. The data were gathered in fall of 2013, and attendance at SI sessions was recorded. Grades for all students enrolled in an SI course are requested from the registrar each term and paired with each student's SI attendance. The researchers removed students enrolled in SI courses in which SI attendance was incentivized in some manner such as extra credit. This lessens the possibility of external incentives as the primary motivation for SI attendance. The remaining data set was given to the institutional research (IR) office to connect SI attendees with prior academic characteristics. The following variables were requested for each student: high school GPA; ACT composite score; ACT English, Reading, Math and Science sub-scores; gender, ethnicity and race; student status (first-time freshman or continuing student); and yes/no retention to fall of 2014. Retention for the fall of 2014 was measured by whether a student was re-enrolled on census date of that term. First-time freshman are students with no higher education credits except for credits brought in from high school. Additionally, IR removed minors and part-time students from the data set, and stripped all personally-identifying information, giving each student a unique ID. The researchers removed all students except first-time freshman, as well as freshman students enrolled in two or more SI courses. The remaining data was first-time, full-time freshman students enrolled in a single SI course.

Participants

Four hundred thirty-three first-time freshmen students were included in the study from courses in multiple disciplines, including agriculture, history, political science, biology, humanities, and music. Session attendance is defined as attending at least one SI session

throughout the fall, 2013 term. See Table 1 for descriptive statistics related to participants' ACT composite and sub-scores, high school GPA, race, ethnicity, and gender. The *N*s vary from 387 to 433 due to some missing data points, usually ACT sub-scores.

Table 1

Descriptive Statistics of the Freshman Students Enrolled in a Single SI-Supported Course

Variable	<i>N</i>	SI Session Attendance		<i>M</i>	<i>SD</i>
		Attended	Did Not Attend		
High School GPA	426	221	205	3.37	0.45
ACT Composite	428	224	204	22.69	3.36
ACT English	410	214	196	21.49	4.46
ACT Mathematics	410	214	196	21.19	3.90
ACT Reading	410	214	196	22.29	4.61
ACT Science	387	205	182	20.51	3.25
Ethnicity					
American Indian/Alaska Native	1	0	1		
Asian	3	2	1		
Black, Non-Hispanic	27	10	17		
Hispanic	16	9	7		
Multi-race	12	6	6		
Non-Resident Alien	2	2	0		
Unknown	3	1	2		
White, Non-Hispanic	369	196	173		
Gender					
Female	260	145	115		
Male	173	81	92		

Data Analysis

To answer RQ1, the researchers used null hypothesis significance testing and independent samples t-tests to compare group mean high school GPA, ACT composite scores, and ACT sub-scores for students attending SI sessions with those who did not attend SI sessions. If the indicated data point was missing for students, they were removed from the analysis. To determine the presence of significant relationships between SI attendance and retention in the fall, a chi-squared analysis was used.

Findings

Differences in Prior Academic Performance

The first research question sought to determine if there was a difference between the mean high school GPA, ACT composite scores, and ACT sub-scores of students attending and the not attending SI sessions. The results of the independent samples t-tests are shown in Table 2. Students attending SI had significantly different high school GPA and ACT math sub-scores at $\alpha = 0.05$, with $p = 0.000$ and $p = 0.044$ respectively, than students who did not attend sessions. To gain more information, Field (2009) recommends calculating Pearson's correlation r to determine the effect size of the difference for both high school GPA and ACT math sub-scores. The effect size of the difference between the mean high school GPA of the SI session attendees and non-attendees was $r = 0.214$. Field (2009) defines this a low to medium effect, and a statistically significant finding. Additionally, the effect size r was calculated as 0.0997 for the difference in ACT math sub-scores, a low effect (Field, 2009). The researchers failed to reject the null hypothesis that there is no difference in high school GPA and ACT math sub-scores of first-time freshman students when comparing the students attending and not attending SI sessions.

Table 2

Means of High School GPA, ACT Composite Scores and ACT Sub-Scores for Students that Attended SI Sessions and those that Did Not Attend SI Sessions

Variable	Attended			Did Not Attend			t-score
	N	M	SD	N	M	SD	
High School GPA	221	3.52	0.40	205	3.33	0.48	4.52**
ACT Composite	224	23.00	3.24	204	22.91	3.50	0.27
ACT English	214	22.79	4.48	196	22.59	4.45	0.46
ACT Mathematics	214	22.75	3.92	196	21.97	3.85	2.02*
ACT Reading	214	23.30	4.39	196	23.81	4.84	1.10
ACT Science	205	22.96	3.06	182	22.95	3.46	0.03

Note. * $p < 0.05$, ** $p < 0.001$

Due to the significant difference between the high school GPA of the SI session attendees and non-attendees, the researchers chose to split the participants into two high school GPA bands, a “High GPA” and “Low GPA” group. This split acts as a partial control for the significant difference in high school GPA between the SI attendees and non-attendees. This approach is similar to Ogden et al.’s (2003) examination of the impact of SI on conditionally-admitted students compared to traditional students as two separate groups and Arendale’s (2001) method of breaking up students enrolled in SI courses into quartiles based on prior academic performance and subsequent comparison of the impact of SI attendance on grades in each quartile. The split between the High GPA group and Low GPA group was based on the median high school GPA score of 3.55. Students without high school GPA data were left out of the analysis. As suggested by Field (2009), independent samples t-tests were separately conducted on mean

high school GPA in each group. The results of the t-tests showed no statistically significant differences ($\alpha = 0.05$) in high school GPA between SI attendees and non-attendees in either the High GPA ($p = 0.82$) or Low GPA groups ($p = 0.07$). The results are summarized in Table 3. The difference in ACT math sub-scores, although significant, revealed a minor effect size and was ignored in the analysis.

Table 3

Independent t-Tests on the High School GPA between the SI Attendees and Non-Attendees in the High GPA and Low GPA Groups

High School GPA Group	Attendance to SI sessions in the Fall of 2013	High School GPA			
		<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> -value
High GPA	Attended	133	3.789	0.14	0.82
	Did not attend	80	3.794	0.15	
Low GPA	Attended	88	3.120	0.33	0.07
	Did not attend	125	3.033	0.36	

Impact of SI Session Attendance on Freshman Retention

Pearson's Chi-Squared analysis was then performed separately on both the High GPA and Low GPA groups to determine proportional retention differences of SI attendance in the fall of 2013 and retention to the fall of 2014. For the High GPA group, Pearson's Chi-Square analysis was not statistically significant at the alpha level of 0.05 between SI attendance in the fall of 2013 and the retention of the students in the fall of 2014, $X^2(1) = 1.081, p = 0.298$. For the high GPA group, the researchers failed to reject the null hypothesis that there is no difference in retention for SI attendees and non-attendees. The frequency table of SI attendance for the High GPA group is located in Table 4.

For the Low GPA group, Pearson's Chi-squared analysis resulted in a statistically significant proportional retention differences between the SI attendance in the fall of 2013 and retention to the fall of 2014 at $\alpha = 0.05, X^2(1) = 7.924, p = 0.005$. For the Low GPA group, the researchers reject the null hypothesis in favor of the alternative: there is a statistically significant difference in retention

rates between students who attended SI sessions and those who did not. Additionally, the odds ratio was calculated as 2.273. This indicates that the odds of a student being retained in the Low GPA group are over two times greater if they attend SI than if they do not. A frequency table of the Low GPA group and their SI attendance is located in Table 4. Figure 1 displays a bar graph with retention percentages of High and Low GPA groups.

Table 4

Frequency Table of Fall 2013 Freshman Students who were Retained in the Fall of 2014 and their Fall 2013, SI Session Attendance

GPA Group	Retention to Fall 2014	Attendance to SI sessions in Fall 2013	
		Attended	Did not attend
High GPA	No	15	13
	Yes	118	67
Low GPA	No	26	61
	Yes	62	64

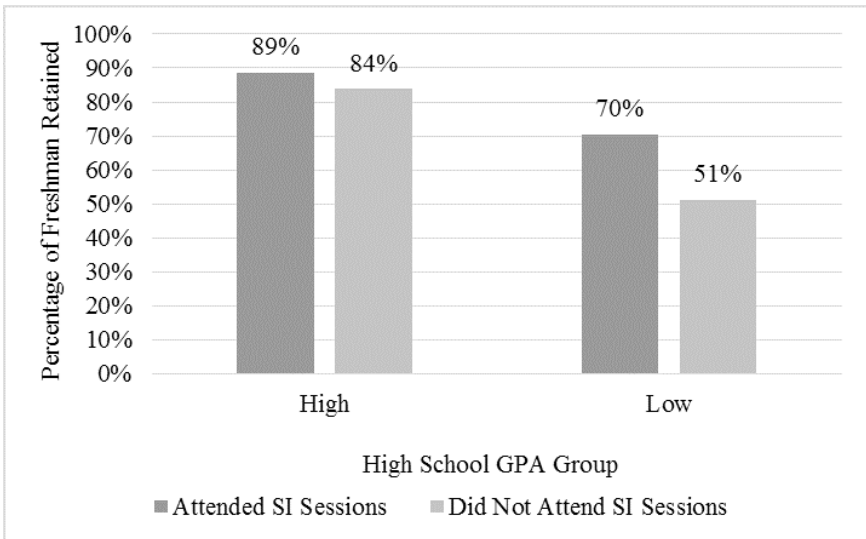


Figure 1. Percentage of Freshman retained by SI attendance status and high school GPA, 2013-2014 (N=426)

Analysis

The significant results of the *t*-test for the difference in mean high school GPA between students who attend SI sessions and those who do not is intriguing. As high school GPA for SI attendees is higher, this might suggest that the academic ability of the SI attendees is, on average, better. By implication, such students would likely succeed and be retained with or without SI sessions. This result is similar to Bowles and Jones's (2004) results that students with high GPAs attended SI sessions. The lack of significant differences in ACT composite scores between the SI session attendees and non-attendees in our study, however, suggests no difference in student academic ability for SI attendees and those not participating in SI. This dichotomy implies that high school GPA may involve some other characteristic other than academic ability. Future researchers may wish to account for the phenomenon of grade inflation in their methodology.

The researchers hypothesize that GPA differences may be attributable to student motivation, as it seems likely high school GPA success is related to effort and motivation, both of which would be predictive of SI attendance. While the researchers did not perform a grade analysis, this finding runs contrary to Blanc, DeBuhr, and Martin's (1983) findings that motivation is not solely attributable for differences in course grades between SI attendees and non-attendees. However, this is in line with Malm, Bryngfors, and Mörner's (2011) conclusions that SI attendees are more motivated.

The Chi-Squared analysis resulted in impactful findings. The Chi-Squared statistic does not indicate a statistically significant difference for the fall 2014 retention of the High GPA freshman students who went to SI and those who did not. Tentatively, these results indicate that students who have a greater high school GPA are likely to be successful and persist with or without attending SI sessions. This result agrees with Bowles and Jones's (2004) findings that SI attendance does not influence retention and mirrors Oja's (2012) findings that students with GPA higher than 1.0 (the vast majority of students at most Universities) would be successful with or without SI. The influence of GPA as a factor in this study differs from Oja's (2012) findings, as our results indicate that freshman

students with a high school GPA greater than 3.55 would likely be successful with or without SI if they are enrolled in a single SI course.

The results of the Chi-Squared analysis for the fall 2014 retention of freshman students with lower than a 3.545 high school GPA were statistically significant. Students with low high school GPA who attended SI sessions were more likely to be retained. By dividing the students into two high school GPA groups, high and low GPA, the prior academic performance and perhaps even the motivation of the students is controlled in this model. These results allow the researchers to conclude that SI session attendance plays a significant impact on freshman student retention for students with a high school GPA less than 3.55. This finding supports Ramirez's (1997) and Ogden, Thompson, Russell, and Simons's (2003) research that SI positively impacts conditionally-admitted, at-risk students who often have a lower GPA coming into college. This study also builds upon Kochenour et al.'s (1997) finding that students with a lower predicted GPA made significant improvement with SI when compared to students with higher predicted GPA. Additionally, the researchers surmise that SI attendance can improve retention across institution types, and may be especially promising for those institutions serving a high percentage of under-represented students from minority backgrounds and/or those from lower socio-economic backgrounds or with first-generation status. This assertion about the efficacy of SI draws upon the literature, especially Kochenour et al. (1997) and Ogden et al (2003).

The results of this study are especially promising when evaluating the impact of SI because the findings are based on a very conservative statistical model. This study involves only freshman students enrolled in one SI course. It does not include students enrolled in two or more SI courses. Our study defines SI attendance as attending one or more SI sessions; it is likely that attending more sessions would yield a far greater impact. These results suggest several additional areas for investigation.

Recommendations for Future Study

There are several potential areas for additional research. If motivation or effort impacts SI attendance and therefore retention,

more rigorous research needs to be performed on the impact of motivation on SI attendance and how that motivation might influence academic performance. Additionally, more research is needed on factors influencing retention among the High GPA group. Specifically, the field would benefit from research examining student characteristics most influential on persistence and retention while investigating differences in student retention among students in different GPA bands when receiving SI. This study only considered freshman participants, and it is likely that SI attendance benefits upper-class students as well. Future researchers might consider identifying the impact of SI attendance on the retention of non-freshman college students. Ramirez (1997) demonstrates that requiring SI attendance for some students has been beneficial, so additional research might investigate the impact of both requiring and incentivizing SI attendance. Our analysis defines SI attendance as attending one session or more; it is unknown what the impact of attending the full complement of SI sessions and its subsequent effect on retention. Finally, future studies investigating Supplemental Instruction may disaggregate the impact of SI attendance by content area, to determine differential impacts which may yield insight into how various majors respond to SI.

Conclusions

Based on the results of this study, SI is a powerful learning assistance strategy for universities to employ to support freshman students' academic skill development and improve retention in traditionally challenging courses. The results of this study support Arendale's (2001) findings that students attending SI sessions have higher high school GPA, while increasing likelihood of retention for lower-GPA university students attending SI sessions.

Special efforts by the administration and faculty should be made to market the benefits of attending SI to the students with lower high school GPA, as they will likely receive substantial academic benefits from attending. As SI is an effective program which retains and helps students develop, it should be expanded to other traditionally challenging courses at the institution studied. The state in which the institution is located has competitive performance

funding based on retention, development, and placement of college students. SI provides an impactful method to improve student retention. SI is also cost-effective, as it uses labor (students) which can be significantly less costly to acquire than full or part-time faculty. Additionally, better retention significantly benefits institutions in the competitive performance funding climate; SI adds value.

Overall, SI programs are effective learning support systems which help college freshman students persist to be retained to the sophomore year. By implication, SI programs should be expanded to help institutions by improving performance on metrics used to evaluate institution retention rate and similar accountability measures used to allot state funds. SI program expansion would likely benefit college students with lower entrance qualifications. Since at-risk students most often attend open-enrollment or moderately-selective institutions, college administrators may consider expanding SI session offerings to target and support at-risk students by encouraging their participation in SI.

In a competitive and rapidly-changing higher education environment, student retention is increasingly significant. This study indicates that well-designed Supplemental Instruction programs provide an avenue for improved college student outcomes, specifically for at-risk students. Learning assistance and support professionals should strongly consider implementing SI programs, which augment retention while developing college student learning and collaboration.

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