The Role of Work Experiences in College Student Leadership Development: Evidence From a National Dataset and a Text Mining Approach to Examining Beliefs About Leadership

Author: Jonathan Scott Lewis

Boston College

Lynch School of Education

Department of

Educational Leadership and Higher Education

Higher Education Administration

THE ROLE OF WORK EXPERIENCES IN COLLEGE STUDENT LEADERSHIP DEVELOPMENT: EVIDENCE FROM A NATIONAL DATASET AND A TEXT MINING APPROACH TO EXAMINING BELIEFS ABOUT LEADERSHIP

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JONATHAN S. LEWIS

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Abstract

The role of work experiences in college student leadership development: Evidence from a national dataset and a text mining approach to examining beliefs about leadership

Jonathan S. Lewis

Dr. Heather Rowan-Kenyon, Chair

Paid employment is one of the most common extracurricular activities among full-time undergraduates, and an array of studies has attempted to measure its impact. Methodological concerns with the extant literature, however, make it difficult to draw reliable conclusions. Furthermore, the research on working college students has little to say about relationships between employment and leadership development, a key student learning outcome.

This study addressed these gaps in two ways, using a national sample of 77,489 students from the 2015 Multi-Institutional Study of Leadership. First, it employed quasi-experimental methods and hierarchical linear modeling (HLM) to investigate relationships between work variables (i.e., working status, work location, and hours worked) and both capacity and self-efficacy for leadership. Work location for students employed on-campus was disaggregated into 14 functional departments to allow for more nuanced analysis. Second, this study used text mining methods to examine the language that participants used to define leadership, which enabled a rich comparison between students' conceptualizations and contemporary leadership theory.

Results from HLM analysis suggested that working for pay is associated with lower self-reported leadership capacity, as defined by the social change model of

leadership development, and that this relationship varies by workplace location and across institutional characteristics. The association between working status and self-efficacy for leadership was found to be practically non-significant, and hours worked per week were unrelated to either outcome.

Results from text mining analysis suggested that most students conceptualize leadership using language that resonates with the industrial paradigm of leadership theory— leadership resides in a person with authority, who enacts specific behaviors and directs a group toward a goal. Disaggregated findings suggested that students who work off-campus consider leadership differently, using language consonant with contemporary, post-industrial scholarship—leadership is a dynamic, relational, non-coercive process that results in personal growth and positive change.

In sum, the findings both echo and challenge aspects of existing research on leadership and working college students. Future research should explore off-campus work environments in greater detail, while practitioners and scholars who supervise students should aim to infuse post-industrial conceptualizations into on-campus work environments.

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Chapter One: Introduction

American higher education plays a vital role in developing future leaders. In fact, a bachelor's degree is practically a prerequisite for success in the modern economy (Arum & Roksa, 2014; Carnevale & Cheah, 2013). Today's students will become tomorrow's public officials, physicians, lawyers, engineers, educators, gatekeepers to these and other professions, and citizens participating in systems of self-governance and community formation. Professional organizations across higher education that advocate for student learning have recognized this and consider leadership development to be among the most important outcomes of a student's time in college (Association of American Colleges and Universities [AAC&U], 2007; Council for the Advancement of Standards in Higher Education [CAS], 2015; National Association of Student Personnel Administrators [NASPA] & American College Personnel Association [ACPA], 2004). And yet, leadership is a difficult construct to define concretely—it is not clear what is meant across each of its myriad uses—and college students continue to think about leadership in ways that are inconsistent with contemporary scholarship and practice of leader behavior in a postmodern society (Astin & Astin, 2000; Kegan, 1994; Rost, 1991).

Higher education is also in the midst of an inflection point, where concerns about the state of American colleges and universities can be found everywhere: broadcast across old and new media, debated by politicians and pundits, and discussed by average families deciding whether and where to send a child to college (Arum & Roksa, 2011; Altbach, 2011; Blimling, 2013; Kuh, Jankowski, Ikenberry, & Kinzie, 2014; U.S. Department of Education, 2006; Zemsky, 2009). This period is defined by an array of stakeholders—students, parents, faculty, administrators, accreditors, and legislators,

among others—who question the value and purpose of higher education and simultaneously demand that colleges be held accountable for producing measurable gains in student learning. The most prominent voices among them have concluded that colleges and universities are not doing enough to educate students for the demands of modern life. Given this reality, the stakes could hardly be higher for institutions who fail to produce effective leaders.

The process of shaping capable leaders occurs through the numerous curricular and co-curricular experiences that engage a student's time in college. Some activities attempt to develop leaders explicitly, such as leadership majors, minors, certificates, or training programs. Others do so implicitly, as with peer-led endeavors that include group projects and the efforts of student volunteer service organizations.

Paid employment is one of the more common experiences among college students—four in ten full-time students and eight in ten part-time students work for pay while enrolled in college (Snyder, de Brey, & Dillow, 2016)—yet employment has been assumed to detract from rather than contribute to student development (Astin, 1993b). However, this conventional wisdom is starting to shift, as contemporary research has uncovered some positive effects of work on a variety of student outcomes (McCormick, Moore, & Kuh, 2010; Perna, Cooper, & Li, 2006; Riggert, Boyle, Petrosko, Ash, & Rude-Parkins, 2006).

These findings are good news for working undergraduates. However, college and university leaders are not doing enough to leverage this common experience to enhance student leadership development in particular. In fact, the effects of student employment on leadership outcomes are only just beginning to be explored. Salisbury, Pascarella,

Padgett, and Blaich (2012) provide the only theoretically-grounded investigation to date of the impacts of work on leadership capacity, uncovering both positive and neutral effects. Their study has shortcomings, however, and requires validation and testing in a broader population. The present study attempts in part to accomplish these goals.

The practical significance of this study is clear: the nation needs more and better leaders, and the qualities of contemporary leaders should be nurtured in students' work environments as well as they are in other curricular or co-curricular experiences. Given the financial realities of attending college, there are many students who work while enrolled and could benefit from explicit leadership development in the workplace. Furthermore, pre-existing beliefs about leadership have been shown to relate to leadership outcomes (Caza & Rosch, 2014). Understanding both the nuanced ways in which students conceptualize leadership as well as the ways in which work may contribute to self-reported leadership capacity can aid stakeholders who wish to harness paid employment as an intentional training ground for future leaders.

The Multi-Institutional Study of Leadership (2016b) offers an ideal vehicle for investigating how college students who work for pay conceptualize leadership and how work may impact leadership outcomes. Additionally, pinning down the concept of leadership, as perceived by contemporary college students, can help scholarly practitioners who aim to translate leadership theory into practice more effectively. What follows is a brief description of the literature, and conceptual and empirical frameworks that are foundational to this study; the methods that will guide the extensive analysis of existing data; and the implications of this work for both policy and practice in higher education.

Defining Leadership

Administrators and scholarly practitioners of student affairs at American colleges and universities have long espoused the benefits of extracurricular activities, programs, and services for student learning and development (American Association for Higher Education [AAHE], ACPA, & NASPA, 1998; ACPA, 1996; American Council on Education, 1937; Chickering & Gamson, 1987; Keeling, 2006; NASPA & ACPA, 2004). Pascarella and Terenzini (1991, 2005) and, most recently, Mayhew et al. (2016) have catalogued and synthesized several decades of rigorous empirical research that validates these epistemological assertions.

Leadership skill development is one student learning outcome that unifies a variety of stakeholders across higher education (AAC&U, 2007; CAS, 2015; NASPA & ACPA, 2004). Given the varied contemporary conceptualizations of leadership, however, it is challenging to determine if and when students have achieved gains in this competency. Why is it that a clear definition of leadership is so difficult to agree upon? A brief examination of the evolution of leadership studies as a discipline can illuminate some answers to that question.

The Move Toward Post-Industrial Leadership

Scholars and historians of leadership describe a steady evolution in the field from a state of disarray toward one of organizational coherence and investigative rigor (Kezar, Carducci, & Contreras-McGavin, 2006; Komives, 2011). Experts in the discipline (e.g., Northouse, 2016; Rost, 1991) describe the development of distinct leadership philosophies that can be sorted into industrial and post-industrial paradigms (Rost, 1991). The industrial paradigm in the main stresses individual accomplishments, management

principles, and positional authority (Dugan & Komives, 2011; Guthrie, Jones, Osteen, & Hu, 2013; Kezar et al., 2006; Northouse, 2016). The post-industrial paradigm by contrast emphasizes relational process, common purpose, and shared responsibility (Avolio & Gardner, 2005; Dugan & Komives, 2011; Guthrie et al., 2013; Heifetz, 1994; Kezar et al., 2006; Northouse, 2016; Rost, 1991; Uhl-Bien, Marion, & McKelvey, 2007). Theories that act as a developmental bridge between these two paradigms focus on the importance of leadership grounded in morality and service to others (Bass, 1985, 1990; Burns, 1978; Greenleaf, 1977).

In light of this diversity of perspectives on leadership, it becomes more understandable that scholars, practitioners, and students—not to mention the general population—might each conceptualize leadership from a different vantage point. Varying epistemologies serve to heighten these differences. Industrialist theories often rest on positivist assumptions, while post-industrial theories often explicitly embrace a constructivist, critical, or postmodern stance. To illustrate this point, post-industrial scholars will emphasize that leadership flows from a dynamic, relational process between positional leaders and followers—tenets that are firmly rooted in social constructivism (Kezar et al., 2006).

Studies that have examined how college students think about leadership or reflect on their experiences as positional leaders repeatedly show that students reflexively conceptualize leadership using assumptions and language from the industrial framework. However the evidence that underlies this assertion remains shaky. Among the studies that have employed quantitative methods, methodological shortcomings (e.g., problems with sampling) make it difficult to know whether colleges are having even modest success in

shifting students toward a post-industrial understanding of leadership. The studies that rely on qualitative methods offer rich detail in student conceptualizations but cannot claim that their findings are generalizable beyond the specific sample.

This study takes the position that skills and competencies sharpened by post-industrial leadership are more effective in solving contemporary problems and should be explicitly nurtured among college students across the curriculum and co-curriculum. Toward that end, a leading post-industrial theory—the social change model of leadership development—serves as the conceptual framework of the study.

Conceptual Framework: The Social Change Model of Leadership Development

Beginning in the late 1980s, a branch of leadership studies that examined leadership development in college students began to grow. Several influential theories were developed from that line of work, including The Leadership Challenge (Kouzes & Posner, 1987/2012), the relational leadership model (Komives, Lucas, & McMahon, 1998/2013), the leadership identity development model (Komives, Longerbeam, Owen, Mainella, & Osteen, 2006), and the social change model of leadership development (Higher Education Research Institute [HERI], 1996).

Created specifically for use with college students, the social change model (SCM) views leadership as "a process rather than as a position," and promotes values that include self-knowledge, collaboration, social justice, and citizenship (HERI, 1996, p. 18). The SCM is considered the most applied model among college student leadership programs (Dugan, Bohle, Woelker, & Cooney, 2014; Kezar et al., 2006). The model consists of seven core values—consciousness of self, congruence, commitment, collaboration, common purpose, controversy with civility, and citizenship—interacting at

the level of the individual, the group, and the larger community to produce social change (HERI, 1996).

The SCM is at the heart of *Leadership Reconsidered* (2000), a clarion call for change from seminal higher education scholars Alexander and Helen Astin and colleagues. Declaring that "the problems that plague American society are, in many respects, problems of leadership," these scholars argued forcefully that faculty, administrators, and students ought to embrace activities and behaviors that are central to the post-industrial mindset (Astin & Astin, 2000, p. 2). Anyone "who serves as an effective social change agent" can be a leader, these authors declared, regardless of whether an individual occupies a position of organizational authority (Astin & Astin, 2000, p. 2). This paper enhanced the reputation of the SCM, and had an impact on leadership programs and research in subsequent years (Kezar et al., 2006; Komives, 2011).

The SCM provides the most accessible framework for college students to learn post-industrial leadership skills, and so this study adopts its central goal—socially responsible leadership—as the primary outcome variable of interest. A measure to operationalize the SCM was developed, and by the mid-2000s researchers at the University of Maryland-College Park had designed a national study—the Multi-Institutional Study of Leadership (MSL)—to investigate socially responsible leadership among college students (Dugan, 2011; Dugan & Komives, 2007; Tyree, 1998). The MSL has been administered multiple times since 2006, and studies have examined its data to better understand relationships between college experiences and leadership outcomes.

Can Paid Employment Contribute to Socially Responsible Leadership Development?

One striking gap in the literature on college student leadership development concerns the population of students who obtain paid work while enrolled. A large number of students work while in college, and they dedicate a significant amount of time each week to their jobs (Kena et al., 2016; Snyder et al., 2016). Furthermore, trends in college pricing and financial aid suggest that the percentage of working students will remain stable or increase in the future (College Board, 2015a, 2015b). Some evidence suggests that employment may provide students additional benefits beyond a paycheck. Contemporary research on the effects of working suggests that students are not necessarily worse off than their peers who do not work and, in some cases, may report higher grades and stronger persistence (McCormick et al., 2010; Perna et al., 2006, Riggert et al., 2006). An array of studies also have suggested that work positively impacts post-college outcomes, including full-time employment, salary, and professional skill development (Carnevale, Smith, Melton, & Price, 2015; Cheng & Alcántara, 2007; Mulugetta & Chavez, 1996; Pascarella & Terenzini, 2005; Stern & Nakata, 1991). In light of this research, it is not only reasonable but important to examine working students' experiences and conceptualizations for evidence of leadership development.

A handful of studies have included work experiences while modeling the influence of many predictors of socially responsible leadership and found limited or no impact, although none situated work explicitly in a theoretical or conceptual framework (Dugan, Garland, Jacoby, & Gasiorski, 2008; Dugan & Komives, 2010; Stephens & Rosch, 2015). However, a recent, theoretically-grounded examination of the influence of

work on leadership capacity has changed the narrative substantially. Looking at a national sample of nearly 3,000 first-year students, Salisbury et al. (2012) found that off-campus work in particular appears to have a positive effect on self-reported leadership capacity. This study in part seeks to validate their finding. Validation studies are needed because the literature on working undergraduates is plagued with inconsistencies and contradictions (Riggert et al., 2006; Salisbury et al., 2012). Atheoretical models and endogenous differences between working and non-working students threaten the validity of the extant literature (Perna et al., 2006; Riggert et al., 2006; Stinebricker & Stinebricker, 2003; Triventi, 2014).

As with investigations of college student leadership development, little is known about how students think about experiences related to work. Two rigorous studies that examined working students' perceptions suggest that students perceive a variety of benefits related to employment, including acquisition of capital, skill development, and career enhancement (Cheng & Alcántara, 2007; Nuñez & Sansone, 2016). More research is needed to understand to what extent students perceive leadership development as related in any way to their work experiences.

Empirical Framework

The present study relies on Astin's (1984, 1993b) theory of student involvement and, in particular, his college impact model as an empirical framework. In his student involvement theory, Astin (1984) defined involvement as "the quantity and quality of the physical and psychological energy that students invest in the college experience" and proposed that greater involvement leads to enhanced growth (p. 307). The college experience consists of the substantive curricular, co-curricular, and extracurricular

activities and programs with which students engage during their time in college. Astin (1993b) later asserted that the impact of college can be determined by comparing measures of students before they enter college against outcome assessments taken a year or more after they have interacted with some aspect of the college environment. Potential outcomes include short- and long-term cognitive, non-cognitive, psychological, and behavioral changes (Astin, 1993b).

Astin's (1993b) college impact model—often referred to as the inputs-environments-outcomes, or I-E-O, model—is usually applied through longitudinal design, which ensures that researchers can isolate student development as an effect of their involvement with a specific college experience. However in this study, as in others that rely on cross-sectional MSL data, modifications are made to account for possible bias that might appear in a time-lapsed design (Dugan, 2015; Rohs, 2002). Following the model established in other studies of MSL data, and in keeping with Astin's (1993b) framework, student characteristics and retrospective accounts of precollege behavior will serve as inputs, work variables represent the environmental constructs of interest, and leadership capacity and self-efficacy act as the outputs.

Research Questions

The concerns about the existing literature described previously will be addressed substantially by the present study, which will attempt to assess students' conceptualizations of leadership—in particular, drawing contrasts between populations of working and non-working students—and to determine the possible impact of work on self-reported leadership capacity. This study is guided by a primary research question: How do college students' paid work experiences relate to their leadership capacity and

beliefs about leadership? Three detailed questions will guide the study design and analysis:

1. Among a national sample of college students, what are the characteristics of students who work for pay while enrolled?
2. Do significant associations exist between aspects of the work experience and self-reported capacity or self-efficacy for leadership?
3. Among a national sample of college students, is work status associated with variation in how students conceptualize leadership?

Methods

Data from the 2015 administration of the MSL will be used to address the research questions. The MSL is an international survey of college students that examines the impact of higher education experiences on student leadership development (Dugan, 2011). The MSL, which relies on the social change model as a theoretical framework, is ideal for addressing the present questions. It is the only sizable dataset (n=77,489) that allows for investigation of students' conceptualizations of leadership in their own words, as well as for the relationships between work experiences and leadership capacity to vary by specific on-campus workplace.

The first research question aims to construct a profile of contemporary working college students, and how work status varies across demographics. The second research question is concerned with the extent to which paid work is associated with socially responsible leadership capacity and self-efficacy for leadership, and the ways in which those relationships change based on where a student works and for how many hours he or she works each week. The evidence to address these first two questions is captured by

several items on the 2015 MSL that ask respondents to report whether they are working at a job on-campus and/or off-campus, and the number of hours they work each week in each location. For respondents who report working on-campus, they are subsequently asked to provide the department or office in which they currently work the majority of their hours.

The third research question is concerned with how students think about leadership, in what ways their beliefs relate to industrial or post-industrial theories, and where variation exists within these beliefs. The evidence to answer these questions is provided by the 2015 MSL in the form of responses to an open-ended prompt that asks for a brief definition of the term "leadership" in the participant's own words. Nearly 68,000 students answered this question—a number infeasible to code by hand using traditional qualitative methods. Software developed for text mining, however, can organize, clean, and prepare large quantities of text for subsequent analysis (Ignatow & Mihalcea, 2017; Miner, Delen, Elder, Fast, Hill, & Nisbet, 2012). Once the text is given some structure, text mining processes then strip away the metaphoric façade to expose its underlying architecture, which includes the most frequent words and phrases, relationships between words and phrases, major themes, emotional content, and variation in language across independent variables. As one example, if respondents used the phrase "common good" more frequently than other two-word phrases, that would indicate students are interpreting the construct of leadership with one of the core values of the social change model.

Text mining also will be used to organize the department-level data for students working on-campus into major categories of work, such as residential life, academics,

libraries, or athletics. Descriptive and inferential statistics will then be used to make sense of these data, and paint a picture of working students as captured by this particular study. For instance, hierarchical linear modeling will be used to investigate whether work status predicts self-reported leadership capacity, controlling for inputs and other environmental variables. The purpose of such a test is to see if working college students are more likely to report different levels of leadership capacity based on where they work and how often they work each week.

Limitations

Two main limitations are present at the outset of this study. First, analyses will be conducted on self-reported data, the validity of which has been called into question by a range of scholars (Dugan, 2015; Bowman & Seifert, 2011; Mayhew et al., 2016; Porter, 2011). Second, the MSL did not collect certain variables that would have added additional insights to an exploration of these particular research questions. For example, off-campus work locations (e.g., retail, hospitality, administrative) would have provided additional variation to model in relationships between off-campus work and leadership capacity.

Implications

Despite the limitations, this study is worth pursuing as it will advance two bodies of literature—student leadership and student employment—that rarely communicate with one another despite likely substantive overlap. The significance of this study is twofold. First, the findings will help faculty and staff better understand the ways in which working students think about leadership. This knowledge is crucial if leadership education and related programs and services are to be effective in meeting students where they are

conceptually, and in helping them to develop the capacity and self-confidence to confront contemporary social problems. Second, the findings will validate, enhance, or possibly refute the results of a recent study (Salisbury et al., 2012) which suggested that work can be predictive of certain leadership outcomes. This knowledge will either strengthen or weaken the case that student employment is a potent vehicle for leadership development.

Positionality

As a college student years ago, I held two or three part-time jobs simultaneously and relied heavily on those funds to meet my living expenses. Beyond a paycheck, I learned a lot about myself and developed a host of transferable skills. Because of these experiences I am motivated to explore the ways in which employment can induce learning in college students.

I also recognize the variation in student employment experiences. In one role, I was engaged in activities that taught me to problem solve, relate to diverse clients, balance multiple tasks, and manage my time effectively, among other skills. In another role, despite earning a similar hourly wage, I spent my time mostly sitting alone behind a desk and completing homework. In the years since then, I have witnessed and in some cases actively facilitated this wide variation in experience as a supervisor of student employees.

This awareness leads me to believe strongly that the ways in which scholars assess the impact of student employment is strikingly reductionist. In other words, when experiences of working students are quite variable across jobs, it seems likely that outcomes related to work would vary as well. Yet the literature on working students ignores this variation, addressing differences that appear only between those students

who work on-campus and those who work off-campus. Therefore, in this study I look to model differences in leadership capacity, in part, based on where a student works on-campus.

As a researcher, I also approach the present study from multiple, and at times competing, paradigms. Conceptually, I believe that social problems can be addressed more effectively through relational, dynamic processes that advance both positional leaders and followers. Methodologically, I embrace positivism, using quantitative tools that reduce data to statistically significant, generalizable relationships and patterns that suggest an objective narrative underlying the data. I am aware of these contrasts, and the tensions they will produce throughout this study. I remain optimistic that a nuanced understanding of these perspectives will strengthen my subsequent analysis and discussion of the findings.

Chapter Two: Literature Review

A nearly 70-year history of authoritative position papers describes and documents relationships between out-of-class experiences and college student development (ACPA, 1996; AAHE, ACPA, & NASPA, 1998; American Council on Education, 1937; Chickering & Gamson, 1987; NASPA & ACPA, 2004). Crafted primarily by scholarly practitioners in student affairs, these philosophical manifestos share a thesis that students learn through every experience they have at college—curricular (e.g., the classroom), co-curricular (e.g., internship), and extracurricular (e.g., residence hall, student organizations). Empirical research confirms these assertions (Mayhew et al., 2016; Pascarella & Terenzini, 1991, 2005). A variety of public and private stakeholders have largely accepted the argument that students learn throughout their college experience, and have embraced outcome frameworks that help to determine if students are attaining important knowledge, skills, and competencies (AAC&U, 2002, 2007; Miller, 2008; New England Association of Schools and Colleges [NEASC], 2016; U.S. Department of Education, 2006). There is a strong divide in academe regarding the wisdom of a strong focus on student outcomes, although the controversy is beyond the scope of this review.

The development of leadership skills is one such student outcome that is valued across higher education (Astin & Astin, 2000; Guthrie et al., 2013). Although a lot is known about leadership, the construct is often difficult to pin down, despite voluminous literature on the topic. Therefore, this review will attempt to describe and reconcile both historical and contemporary understandings of leadership. In the context of college student leadership development, current research that examines relationships with out-of-class experiences also must be explored, in order to evaluate the prevailing assertion that

learning happens outside the classroom, and to highlight unexamined extra- and co-curricular experiences. Paid employment, which will be scrutinized in this review as well, is a very common experience among undergraduates, and offers an environmental variable within which leadership development has been essentially ignored.

To build the rationale effectively for the forthcoming study, this review has been structured in two parts. Part I explores the transformation of leadership studies from a field devoted to understanding traits and behaviors of successful leaders, to one focused instead on the leadership process itself. This latter perspective is grounded in a belief that all individuals are leaders in some capacity and potential agents of social change, irrespective of whether they occupy a formal leadership position (Dugan & Komives, 2011). As will be described below, students' beliefs seem rooted in the earlier school of thought—leadership as person, position, and authority. Understanding the evolution in scholarship and practice of leadership is crucial if faculty and staff are to advance this epistemic shift across the academy, and therefore help students to develop leadership skills necessary to tackle contemporary social problems.

To understand the nature of student employment and need for this particular study, Part II of this review will utilize Astin's (1993b) model of college impact as a conceptual framework to explore paid work as an educational experience that may impact leadership development. There are several reasons for this choice, and each will be discussed in greater detail below. First, paid work is one experience that many college students have in common (Snyder et al., 2016). Second, changes in college pricing and financial aid suggest that large numbers of students will continue to undertake paid work in the future (College Board, 2015a, 2015b). Third, an array of studies, reviews, and

policy papers has cast strong doubts on the conventional wisdom that paid work has a uniformly negative effect on student grades or persistence (McCormick et al., 2010; Perna et al., 2006, Riggert et al., 2006). Some researchers have, in fact, highlighted many of the positive outcomes associated with paid employment, such as skill and career development, and more recently, leadership development (Carnevale et al., 2015; Mulugetta & Chavez, 1996; Salisbury, Padgett, & Pascarella, 2009; Salisbury et al., 2012). In sum, our democratic society requires effective leaders, and a student's workplace is likely a fertile environment for the development of such skills. This review will dive deeply into each of the aforementioned disciplines and attempt to set the stage for a forthcoming study.

Part I: Theory, Epistemology, and Change in Student Leadership Development

Since the colonial era, the uniquely American form of higher education has consistently distinguished itself from its European forebears through a strong commitment "to the service of an evolving dynamic, democratic community" (Brubacher & Rudy, 1997, p. 428). This dedication is enacted in the myriad ways that college faculty and staff attempt to prepare students as citizens and future leaders for a democratic society (Greenleaf, 1977). This section will describe in detail the ways in which leadership development came to be considered an important outcome of a college education.

Investigations of College Impact

Since the 1920s, scholars, practitioners, and other key stakeholders have attempted to understand the specific ways in which students develop as a result of their college experience. According to Pascarella and Terenzini's (2005) synthesis of three

decades of research in higher education, individuals show significant change along a variety of developmental pathways, including cognitive skills, psychosocial development, and moral reasoning, during their time at college. They also found that, except for career and economic outcomes, differences *within* college (e.g., curricular and co-curricular programs) impact student success to a greater extent than differences *between* colleges (e.g., public or private control). Building on this finding, scholars, advocates, and professional organizations in higher education have sought in recent years to promote particular outcomes, irrespective of institutional type or characteristics, that address needs or problems all citizens will face. A recent example is the Lumina Foundation's Degree Qualifications Profile (DQP), which identifies clear and measurable student outcomes at the associate, bachelor's, and master's levels (Adelman, Ewell, Gaston, & Schneider, 2014).

General Agreement on Student Learning Outcomes

Contemporary proponents of collegiate learning outcomes are many and varied. They include research and advocacy groups such as AAC&U (2007) and the Lumina Foundation (Adelman et al., 2014), accrediting bodies like NEASC (2016) and standards organizations such as the Council for the Advancement of Standards in Higher Education (CAS, 2015), and professional organizations representing higher education administrators. Among this diverse group, general agreement has emerged regarding desired student learning outcomes. Although the language varies slightly, college students are expected to make gains in: broad and specialized areas of knowledge, critical thinking and complex reasoning skills; understanding of self and others; the commitment and wherewithal to participate as an informed, caring citizen locally, nationally, and

internationally; skills to manage one's daily affairs; as well as the ability and commitment to engage in lifelong learning. (See Table 2.1).

Table 2.1. Major learning outcomes across professional organizations, academic disciplines, and student affairs

Learning Reconsidered (2004)	LEAP [AAC&U] (2007)	CAS Domains (2008)	Academic Disciplines (2011)	DQP [Lumina] (2014)
• Knowledge acquisition, integration, and application	• Knowledge of human cultures and the physical and natural world	• Knowledge acquisition, construction, integration, and application	• Knowledge bases	• Specialized knowledge • Broad and integrative knowledge
• Cognitive complexity	• Intellectual and practical skills	• Cognitive complexity	• Critical thinking	• Intellectual skills
• Interpersonal and intrapersonal competence • Humanitarianism • Civic Engagement	• Personal and social responsibility	• Intrapersonal development • Interpersonal competence • Humanitarianism and civic engagement	• Intrapersonal attributes and competencies • Interpersonal relations with diverse others • Ethics • Management and collaborative leadership	• Applied and collaborative learning
• Practical competence • Persistence and academic achievement	• Integrative and applied learning	• Practical competence	• Professional skills • Life-long learning	• Civic and global learning

Source: Adapted from Council for the Advancement of Standards (2015) CAS Professional Standards for Higher Education, 9th edition (p. 25).

Leadership skills are embedded explicitly or implicitly in each of these frameworks. For example, the authors of the CAS standards (2015) describe in detail the ways in which student leadership programs should help students make gains in each domain CAS officials regard as vital. Moreover, a recent review of specialized and professional accrediting associations (listed as "Academic Disciplines" in Table 2.1) found that

management and collaborative leadership competencies—including the ability to manage goal-setting, relationships, projects, and change, and to demonstrate a flexible and collaborative leadership style—were the most common outcomes across varied disciplines, mentioned by 22 of 25 groups (Sharp, Komives, & Fincher, 2011).

Other groups are more targeted, or nuanced in their treatment of leadership. The authors of the *Learning Reconsidered* monographs (Keeling, 2006; NASPA & ACPA, 2004) connected leadership theory and experience directly with civic engagement, but not the other outcome areas. The authors of the DQP embed leadership principles implicitly in their description of applied learning and connections to the workplace. They recommend that an undergraduate student, at some point during a bachelor's degree program, "negotiates a strategy for group research or performance, documents the strategy so that others may understand it, implements the strategy, and communicates the results" in order to demonstrate proficiency in applied and collaborative learning (Adelman et al., 2014, p. 18). Without ever using the word 'leader,' the message resonates with the reciprocal, collaborative process promoted by contemporary scholars in leadership studies (Dugan & Komives, 2011).

The key takeaway is that a wide range of individuals and organizations—representing faculty, administrators, and policy experts—who advocate for institutional and student success have situated leadership behaviors and processes among the core of contemporary student learning outcomes. When viewed alongside historical advancements in the contemporary university—including reforms to the curriculum, co-curriculum, administrative structure, college access, and diversity of enrollment (Brubacher & Rudy, 1997)—a resounding acceptance and encouragement of student

leadership development can be viewed as yet another way in which American higher education serves the broader society.

A Turning Point in Leadership Studies

Such widespread agreement that leadership skills are, at the very least, an implicitly valued component of a college education suggests a coherent and mature field of scholarship and practice. However the field was once highly fractured, as demonstrated by a historical examination of the discipline. From both a practical and conceptual standpoint, understanding the evolution of leadership studies is a vital prerequisite to devising strategies to improve student leadership capacity. Komives (2011) acted as a helpful historian for the discipline, charting the history of college student leadership education back several decades, and describing an evolution from a "fragmented set of atheoretical (even antitheoretical), uncoordinated activities with little common language or practices to a field with established theoretical frames, conceptual models, standards of practice, and diverse pedagogical strategies" (p. 2). In fact, leadership studies as a discipline has undergone drastic change across several decades (Kezar et al., 2006).

A major turning point came in 2000, when renowned researchers in higher education, Alexander Astin and Helen Astin, led a group of scholars in drafting a call to action: *Leadership Reconsidered*. A new kind of leadership, the authors argued, was needed to tackle myriad national and international problems, including global warming, religious and racial conflicts, disengagement in the public sphere, and major changes in world economies. As the gatekeepers of society's most important offices, college faculty and staff must prepare students to become citizens and professionals capable of social

change (Astin & Astin, 2000). To do so required more than tinkering at the margins; wholesale change was needed to produce new kinds of leaders. College faculty and staff, they argued, must "embrace significant changes in our curricula, teaching practices, reward system, and governance process and, most importantly, in our institutional practices, values, and beliefs" (Astin & Astin, 2000, p. 4). To accomplish this metamorphosis, the authors urged faculty and staff throughout the academy to adopt principles of "transformative leadership" as described in a new model of leadership development, one grounded in values, collaborative process, and the belief that any member of the community can be an agent of change (Astin & Astin, 2000, p. 8; HERI, 1996).

A key aspect of *Leadership Reconsidered* is its detailed examination of both constraining and empowering beliefs held by different constituencies across the college landscape. For example, students who believe they cannot lead because they do not hold a formal leadership position may self-select out of leadership opportunities, avoid engagement in campus life, and subsequently remain less aware of avenues in which they could pursue change on campus or develop their potential as leaders (Astin & Astin, 2000). An empowering belief by contrast could be one where students recognize their capacity for leadership, irrespective of title, and choose to become involved.

Astin and Astin (2000) wrote that "practicing transformative leadership is a never-ending process" (p. 95), and indeed the call for systemic transformation in leadership education reverberates through many reports, monographs and outcome frameworks that would follow. In particular, *Learning Reconsidered* (NASPA & ACPA, 2004) and *Learning Reconsidered 2* (Keeling, 2006) deliberately linked the curriculum

and co-curriculum in a call for holistic, integrated, contextualized undergraduate education, focused equally on academic tasks such as disciplinary knowledge acquisition and conventional extracurricular activities such as the development of civically-minded leaders.

How Do We Think About Leadership?

The importance of examining leadership studies more broadly, and student leadership specifically, lies in the fact that faculty and staff have the ability to shape future leaders in crucial and positive ways (Astin & Astin, 2000). For example, faculty and staff model ways that people come together and collaborate with a shared purpose in mind, such as discovery in a particular discipline, or service activities in a student-led volunteer organization. They can also teach students how to disagree respectfully in a group setting. In order to embody these principles effectively, it is important that faculty and staff understand historical and contemporary conceptualizations of leadership, both as a discipline and a construct.

Any investigation of leadership must acknowledge that, despite the general agreement regarding its importance as a college outcome, there is no consensus regarding a definition of the word "leadership" (Northouse, 2016; Rost, 1991). This can be problematic for any number of reasons, most especially because without a clear definition of the phenomenon being studied, "the scholars do not know what it is they are studying, and the practitioners do not know what it is they are doing" (Rost, 1991, p. 8). Rost (1991) described in great detail the evolving definitions of leadership since the start of the 20th century, concluding that the field must "reach a consensus on a clear, concise, easily understandable, researchable, practical, and persuasive definition of leadership" (p. 8).

This definitional confusion persists today. Leadership continues to mean different things to different people, according to Northouse (2016), because of generational and cultural differences. Therefore, it is important to know from what definition or conceptual framework the author is working when examining the literature on leadership theory. Rather than argue for the supremacy of any one definition, the present study, as described in Chapters One and Three, seeks to uncover definitions of leadership among a large sample of undergraduates, and determine the ways in which they echo or depart from historical and modern conceptualizations.

As described by a range of scholars (e.g., Burns, 1978; Northouse, 2016; Rost, 1991), leadership philosophies can be divided into industrial and post-industrial paradigms. Industrial theories are "predicated on individual achievement, management, and positional authority" whereas post-industrial theories emphasize "common good, process orientations, and shared responsibility" (Dugan & Komives, 2011, p. 37).

Industrial Theories

The narrative of the industrial paradigm—leader-based, hierarchical, focused on productivity—often begins with the great man theories of the 19th century. Great man theories were characterized by assumptions that leaders are born with natural talents that enable them to wield power and influence others (Dugan & Komives, 2011; Guthrie et al., 2013; Northouse, 2016). Although this is often the initial approach to leadership cited in the historical literature on leadership theories, its influence continues to the present day, such as when positional leaders are selected primarily on account of past accomplishments, or when language is used that ascribes natural leadership capacity to an individual (Guthrie et al., 2013).

Closely related to the great man approach are theories that seek to identify traits of successful leaders, with which they may or may not have been born. Scholars who apply this approach aim to "discover the characteristics and abilities of men who are accomplished leaders in their field, seeking insights and a common denominator of those things that seem to contribute to leadership" (Hargrove, 1952, pp. 75-76). Northouse (2016) synthesized a century of scholarship on trait-based theories and identified five main traits associated with successful leadership: intelligence, self-confidence, determination, integrity, and sociability. Yet relying on such a list necessitates a belief in objectively-defined traits that are assumed to be perceived similarly by all observers. Likewise, trait theories suggest a willful avoidance of the ethnocentrism, classism, male privilege, and entrenched power dynamics that may, in fact, have informed the selection of particular individuals who possess these characteristics to be leaders in the first place (Dugan & Komives, 2011; Kezar et al., 2006).

Behavioral theories emerged in the mid-20th century and reflect a belief that specific actions or tasks associated with successful leadership are more useful to examine than inherent traits, primarily because effective behaviors can be taught (Dugan & Komives, 2011; Guthrie et al., 2013; Kezar et al., 2006). In other words, behavioral theorists care more about what leaders do and how they act than who they are. Northouse (2016) discussed a series of studies at Ohio State and University of Michigan that uncovered two major categories of leader behavior: task behaviors—oriented toward goal achievement—and relationship behaviors—focused on nurturing followers. Shortcomings of these theories include locating leadership within an individual, a lack of empirically-established connections between task or relationship behaviors and

performance outcomes, and an inability of researchers to identify a clear set of ideal behaviors that would result in effective leadership across varied situations (Kezar et al., 2006; Northouse, 2016).

Responding to the fact that learned behaviors may not spur consistently effective leadership, situational and contingency theories emerged in the late 1960s from a recognition that "different situations demand different kinds of leadership" (Northouse, 2016, p. 93). Accounting for variations in context, situational leadership style is characterized by a balance between task and relationship behaviors—in this framework, termed directive and supportive behaviors, respectively—similar to that found in behavioral theories (Dugan & Komives, 2011; Northouse, 2016). An additional element of situational theory reflects the development level of followers—specifically, the degree to which they have sufficient competence and commitment to perform a given task (Northouse, 2016). Leaders in this framework must diagnose a situation and adapt their style appropriately. Contingency theories are closely related, concerned with styles and situations, and propose matching leaders with appropriate settings.

A major critique of situational and contingency theories is that the fluid nature of leader and follower behaviors, dependent as they are on unique circumstances, makes empirical research or translation to practice difficult (Kezar et al., 2006; Northouse, 2016). Still, situational theories in particular held sway for many years because they were practical, prescriptive, emphasized flexibility, and thus were popular in the marketplace (Northouse, 2016).

Bridge Theories

Several theories have been retrospectively conceptualized by scholars as metaphorical bridges that connect the industrial and post-industrial paradigms. The oldest theory among this group is Robert Greenleaf's (1977) model of servant leadership. The basic concept is that servant leaders are servants first; in order to lead effectively, they serve the organization and strive to meet followers' needs (Dugan & Komives, 2011; Greenleaf, 1977; Guthrie et al., 2013). It has been applied extensively in higher education, such as in community service and civic engagement programs, in part due to its post-industrial emphasis on ethics, values, shared process and mutual outcomes (Dugan & Komives, 2011). However, it retains aspects of industrial theories, most especially its reliance on one person—Guthrie et al. (2013, p. 20) termed this the "heroic" leader—in a position of power and influence, rather than embracing relational, reciprocal processes that are the hallmarks of post-industrial models.

James MacGregor Burns is often recognized as the key scholar whose work shifted the field of leadership studies toward the post-industrial paradigm (Dugan & Komives, 2011; Guthrie et al., 2013; Kezar et al., 2006). His classic work *Leadership* (1978) marked a major turning point in the scholarship of leadership studies through his treatment of topics including followership and ethical action (Guthrie et al., 2013). In his exposition of the concept of followership, Burns discusses at length the similarities and differences between leadership and power. The former is an aspect of the latter, though distinctive in several key ways. Both power and leadership are "relational, collective, and purposeful," however leadership is more limited because leaders respect the motives of their followers rather than "obliterate" them in a raw act of control (Burns, 1978, p. 18).

As mentioned above, it is important to clarify the definitions of leadership from which a scholar is theorizing, given the absence of a consensus in the field. For Burns (1978), "the essence of the leader-follower relation is the interaction of persons with different levels of motivations and of power potential, including skill, in pursuit of a common or at least joint purpose" (p. 19). In other words, leadership comprises a relationship of unequal parties moving toward a common goal.

Importantly, this vision of leadership and followership can be enacted in different ways. Burns (1978) differentiated between leaders who employ transactional leadership—the purpose being a simple exchange of something valuable that each possesses—and those who use transforming leadership—the purpose being to "engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality" (p. 20). Moral leadership is therefore the pinnacle for positional leaders; it aims to satisfy the truest needs of both leaders and followers (Burns, 1978). A prime goal for transforming leaders is to help followers develop the capacity to become future leaders themselves (Dugan & Komives, 2011).

Burns' theory was extended through the works of Bernard Bass (1985, 1990), and, later, Joseph Rost (1991). Bass (1985) focused more intently on followers' needs, envisioned situations in which transformational leadership might lead to negative outcomes, and located transactional and transformational leadership as part of a complex system of leader behaviors rather than at opposite ends of a simple continuum (Northouse, 2016). It is important to note here the revised language: *transformational* (Bass, 1985) as opposed to *transforming* (Burns, 1978). Whereas transforming leadership was always concerned with objective improvement and elevation of both leaders and

followers, the concept of transformational leadership is not necessarily moored to ethical principles, and encourages followers to recognize different wants and needs that they may not have been aware of before. Differentiating his work from that of many other leadership theorists of this era, Bass investigated these concepts through empirical research, and developed an instrument to measure transformational leadership called the Multifactor Leadership Questionnaire. In his work, Bass (1990) retained some elements of the leader-centric industrial paradigm. For instance, he described four main characteristics of transformational leaders—charismatic, inspirational, intellectually stimulating, and providing individualized consideration—and contrasted these with behaviors displayed by transactional leaders (e.g., promises rewards for good performance) and those who are non-leaders (e.g., laissez-fare) (Northouse, 2016).

The major contributions of transformational theories are an intense focus on follower needs, motives, and ethics, and a belief that leadership is a reciprocal process, one that depends on effective interplay between leaders and followers. And yet, they retain the hierarchical assumptions of the industrial models, focusing on the work that positional leaders can do to motivate followers toward shared organizational goals. This mostly leader-centric stance is the main reason transformational theories reside in that transitional space between paradigms (Dugan & Komives, 2011; Kezar et al., 2006).

Although bridge theories are somewhat more evolved than their industrial predecessors, several problems can be found with both sets, relative to their focus on leader development, which post-industrial theories seek to ameliorate. First, industrial and bridge theories "exacerbate exclusionary beliefs" that positional leaders—individuals who hold positions of authority in an organizational hierarchy—are extraordinary

individuals who can create positive change on their own by enacting appropriate behaviors, interpreting situations properly, or simply being well-educated in leadership theory (Guthrie et al., 2013, p. 20). Second, they fail to distinguish between leadership with or without authority, and much productive leadership can happen outside of positional authority. Finally, the language used in models that emphasize leader development may be inaccessible to, or seen as hostile by, those individuals who have in the past been excluded from conventional power structures (Guthrie et al., 2013). Post-industrial theories attempt to address these concerns, although it is important to note they run the risk of co-opting equitable, relational, and process-based values that have been long-held by women leaders, leaders of color, and leaders from collectivist cultures (Dugan & Komives, 2011).

Post-industrial Theories

Rost (1991) was the first scholar to specifically label the voluminous literature on leadership published since 1930 as part of an industrial paradigm, and argue for the importance of a "new school of leadership" that would reflect the post-industrial character of modern society (p. 126). Rost (1991) maintained that scholars and citizens alike have conflated leadership with good management, and that this understanding has been woven into our cultural mythology and folklore for over a century. Believing this stance was incompatible with the needs of a post-industrial world, Rost (1991) built from the work of Burns (1978) and proposed a new definition of leadership: "*an influence relationship among leaders and followers who intend real changes that reflect their mutual purposes*" (p. 102, italics in original). Rost (1991) emphasized the importance of followers in this new paradigm by saying they "do leadership, not followership" (Rost,

1991, p. 112). In other words, followers are active as opposed to passive, and they may exchange places with the leader from time to time.

Where Rost differed from Burns was in setting aside the moral dimension of leadership. For Burns, moral ends were the preeminent purpose of transforming leadership (Kezar et al., 2006; Rost, 1991). For Rost (1991), morality was a separate construct that unnecessarily limited the definitions of post-industrial leadership and transformation. Post-industrial leadership, he contended, could tackle questions that provoke considerable disagreement related to issues of morality—for example, abortion and capital punishment—while remaining ethical in process, that is, "noncoervice, multidirectional, influence-oriented, real, and mutual" (p. 124).

A more recent theory that recaptures a strong ethical foundation alongside principles from positive psychology—authentic leadership development theory—attempts to explain underlying processes that occur at the foundation of multiple leadership models (Avolio & Gardner, 2005; Kezar et al., 2006). Avolio and Gardner (2005) described authentic leadership as a "root construct" from which other forms of positive leadership, such as servant or transformational leadership, can emerge (p. 328). They focused heavily on the relational and dynamic processes that occur between leaders and followers within a complex organization, while retaining elements of a leader development approach (Guthrie et al., 2013; Northouse, 2016).

Ronald Heifetz's (1994) theory of adaptive leadership focuses on the ways in which leaders activate followers within specific contexts to move toward successful outcomes. For leadership to be adaptive in nature, it must approach complex problems that necessitate collaborative learning to solve (Guthrie et al., 2013; Heifetz, 1994;

Northouse, 2016). Heifetz (1994) distinguished this type of adaptive challenge from equally complex technical challenges for which currently available knowledge is sufficient to find a solution. Adaptive challenges demand a process through which leaders, operating within a specific system of values, perform certain behaviors that "*mobilize, motivate, organize, orient, and focus the attention of others*" (Northouse, 2016, p. 258, italics in original).

Adaptive leadership is included as one component of complexity leadership theory (Uhl-Bien et al., 2007), which seeks to foster "creativity, learning, and adaptability" in a hierarchical organization, one that is aware of its own socially-constructed, historically-informed context (p. 299). Related chaos theories question assumptions embedded in situational and contingency theories that leader behavior can be matched appropriately to a variety of circumstances (Kezar et al., 2006). Instead, "complex interactions" among internal and external environments (e.g., individual, organizational, societal) must be considered in order to understand leadership effectively (Dugan & Komives, 2011, p. 41). Rigid constructs such as hierarchy and positional authority are devalued, while decentralization and systems thinking are favored (Kezar et al., 2006).

Post-industrial theories are challenging to understand and likely difficult to enact in loosely coupled systems such as universities, which operate as de facto conglomerates of related functions, and are therefore notoriously difficult to lead (Cohen & March, 1986/2010; Kezar et al., 2006; Weick, 1976). Additionally, relational, processual leadership seems antithetical to many of the commercial and corporate norms that drive the behaviors and practices of college officials (Slaughter & Rhoades, 2011). By contrast,

post-industrial tenets appear to be well-matched to equitable relationships that may form among student-led organizations, such as those who seek to redress social problems through campus-based activism, and among faculty and students engaged in a learning process that involves shared discovery.

A Discussion of Epistemology

A discussion of assorted epistemologies can illuminate how diverse ways of knowing lead to radically different conclusions about the nature of leadership. Kezar et al. (2006) discussed at length the evolution in epistemological paradigms applied to leadership studies. Throughout the industrial theories discussed above, a positivist or functionalist perspective is dominant. A positivist stance rests on ontological foundations of universal truths, uncovered through objective research aimed at predicting outcomes and creating generalizable knowledge (Guba & Lincoln, 1993; Kezar et al., 2006). In the context of leadership, industrial approaches such as great man, trait, behavioral, and situational theories attempt to capture and describe universal characteristics and processes related to leadership, management, and the use of power. Although a positivist epistemology guides much of the research on college student leadership development described below, critics rightly deride the "context-free, value-free representations" which fail to account for a wide array of varying perspectives embraced by alternate paradigms (Kezar et al., 2006, p. 18).

Emergent epistemologies in leadership studies include social constructivism, critical theory, and postmodernism, and these are reflected more fully in post-industrial theories (Kezar et al., 2006). Social constructivist research in leadership focuses on the interactions between leaders, followers, and their surrounding context and culture.

Allowing for variety in interpretation and meaning-making, leadership scholars employing social construction hope to elicit greater complexity in the field and uncover a more nuanced understanding of the nature of leadership.

Critical theorists in leadership studies "focus primarily on power dynamics that are hidden in the phenomenon of leadership, particularly oppression and abuses of power" (Kezar et al., 2006, p. 21). Critical perspectives embrace the related realities of marginalization and agency that exist for followers who do not identify with the dominant image of a leader as portrayed by industrial theories (e.g., white, male, straight, or upper-class). Consistent with a desire to bring about "transformation of the social, political, cultural, economic, ethnic, and gender structures that constrain and exploit humankind" (Guba & Lincoln, 1993, p. 66), critical theorists in leadership seek an entirely new approach grounded in liberation and common humanity (Kezar et al., 2006).

Postmodernists share common ground with both social constructivists and critical theorists, including a focus on subjective perceptions, ambiguity, power, and the nature of change. Postmodern theory directly attacks the tenets of positivism, and aims to dismantle notions of objective reality or truth. As Gergen (1991) wrote:

> Postmodernism does not bring with it a new vocabulary for understanding ourselves, new traits or characteristics to be discovered or explored. Its impact is more apocalyptic than that: the very concept of personal essences is thrown into doubt. Selves as possessors of real and identifiable characteristics—such as rationality, emotion, inspiration, and will—are dismantled (p. 7).

Applying this concept to leadership studies, industrial theories that focus on traits of successful leaders, for example, cannot withstand the deconstruction of the individuals

themselves or the very notion that objective traits exist in the world. Postmodern theorists view the process of leadership as inseparable from its context, as opposed to something that is generalizable. Moreover, postmodern perspectives point to an examination of the ways in which leaders and scholars use language to shape perceived reality, and, in so doing, reify hegemonic systems that oppress followers (Kezar et al., 2006).

Together these alternate epistemologies provide vehicles for theorists to consider varying perspectives, examine power dynamics, and deconstruct common assumptions as they attempt to understand the concepts of leader and leadership. Rost (1991) argued for their importance in proposing a new school of leadership studies, and these perspectives are demonstrated, in part, through the post-industrial theories described above.

Theories of College Student Leadership Development

Beginning in the late 1980s, scholars began to examine college student leadership development specifically. Several key theories were developed from that line of work, and will be discussed in greater detail in this section. One of the earliest models of leadership development applied to college students is known as The Leadership Challenge (TLC; Kouzes & Posner, 1987/2012). Extending Burns' (1978) work, Kouzes & Posner (1987/2012) interviewed over 1,200 managers in business and identified five behaviors that aspiring transformational leaders can employ. These are: model the way; inspire a shared vision; challenge the process; enable others to act; and encourage the heart (Posner, 2009). The model was later adapted for use with high school and college students, and it has been applied widely. The major critique of TLC is its prescriptive nature; TLC is essentially a behavioral theory, instructing positional leaders in specific actions they can take to be successful (Dugan & Komives, 2011; Northouse, 2016).

In the 1990s, Susan Komives, a recognized scholar in college student leadership, and colleagues began developing the relational leadership model (1998/2013). They conceptualized leadership as "a relational and ethical process of people together attempting to accomplish positive change" (Komives et al., 1998/2013, p. 95). Relationships anchor the model, and a common purpose is its central aim. Komives et al.'s (1998/2013) model suggests an approach to leadership that "builds commitment toward positive purposes that are inclusive of people and diverse points of view, empowers those involved, is ethical, and recognizes that all four of these elements are accomplished by being process-oriented" (p. 95). The authors are careful to distinguish this model from others; it is not a theory, nor is it outcomes-focused. Rather, it is an "aspirational" framework they propose to guide college students who hope to create effective student-led organizations (Komives et al., 1998/2013, p. 95).

Relying on the relational model as a theoretical framework, Komives and four colleagues used a grounded theory approach to identify the processes by which students develop a leadership identity over time (Komives, Owen, Longerbeam, Mainella, & Osteen, 2005). A stage-based theory of leadership identity development (LID) was later devised that applied the findings from their study (Komives, Longerbeam, et al., 2006). The LID model consists of six concrete stages (see Table 2.2). Developmental influences are identified within each stage, including adult and peer role models, experiences with individuals of diverse backgrounds and perspectives, and self-reflection.

The authors of the LID also identified transitional experiences or statements that describe the experience of students ready to move to the next stage. Of the many transitions embedded in the model, the authors describe the shift from stage three (leader

identified) to stage four (leader differentiated) as crucial. This period is when students begin to view leadership as more process than person, one that relies on shared experiences among positional leaders and followers (Komives, Longerbeam, et al., 2006).

Table 2.2. Stages of the Leadership Identity Development Model.

Stage	Description
Awareness	Exposure to leadership and recognition of leaders external to the self
Exploration/Engagement	Becoming actively involved in groups, developing skills, and preparing for leadership roles
Leader Identified	
Emerging	Taking on individual responsibilities and identifying new skills that are needed
Immersion	Moving in and out of leader and follower roles, while viewing leadership as primarily positional; focused on concrete tasks and accomplishments
Leader Differentiated	
Emerging	Recognition that leadership is broader than positional leaders ("I am *a* leader even if I am not *the* leader"); becoming more open and letting go of control
Immersion	Recognition that leadership is a group process, happening everywhere
Generativity	Commitment to personal causes and development of others' leadership skills; focus on transforming leadership and team growth
Integration/Synthesis	Values self, others, and the process, and a lifelong process of learning. Open to revisiting these stages during periods of "contextual uncertainty"

Source: Adapted from Komives, Longerbeam, Owen, Mainella, & Osteen, 2006, pp. 404-405

The researchers compare these transitions to Kegan's (1994) theory of evolving consciousness; each transition point is marked by students taking as "object" something that had previously been "subject." In particular, the key transition from leader identified to leader differentiated is marked by a shift in consciousness from third-order thinking (traditionalism) to fourth-order thinking (modernism). Fourth-order thinking is evidenced

by the capacity for "self-authorship," the ability to construct one's internal identity in relation to others (Kegan, 1994, p. 185). This sense of interdependence is a foundation for the final three stages of the model, which also reflect principles embedded in the post-industrial theories of leadership described above (e.g., Rost, 1991). It is important to note limitations of the LID, chief among them its underlying sample, composed of 13 individuals (eight who identified as White) from one institution, which hampers its generalizability.

Beginning in fall 1994, a group of scholars came together for a series of meetings facilitated by Alexander and Helen Astin at UCLA to develop what would become the social change model (SCM) of leadership development (HERI, 1996). Created specifically for use with college students, the SCM has been identified as "the most applied theory in the context of collegiate leadership development programs" (Dugan & Komives, 2011, p. 45). The SCM views leadership as "a process rather than as a position," and promotes the values of "equity, social justice, self-knowledge, personal empowerment, collaboration, citizenship, and service" (HERI, 1996, p. 18). Its two primary goals are to improve student learning through enhancements in self-knowledge and leadership capacity, and to create positive social change in the broader community. Bearing in mind Rost's (1991) critique of hazy definitions, it's important to note that the authors of the SCM view leadership uniquely as a "purposeful, collaborative, values-based process that results in positive social change" (Komives, Wagner, & Associates, 2009, p. xii).

The model depicts seven core values, across three distinct though related domains—the individual, the group, and the community (see Table 2.3).

Table 2.3. The Core Values of the Social Change Model of Leadership Development

Core Value	Description
Individual Values	
Consciousness of Self	Self-awareness of motivating beliefs, values, attitudes, and emotions
Congruence	Alignment between thoughts, feelings, and behaviors; "consistency, genuineness, authenticity and honesty toward others"
Commitment	Motivating energy to serve, both in a group activity and toward its intended outcome
Group Values	
Collaboration	Working with others in trusting relationships and dividing up tasks in a common effort
Common Purpose	Group work informed by shared vision, goals, and values
Controversy with Civility	Acknowledging and sharing inevitable differences in opinion in a civil manner
Community Values	
Citizenship	Both individual and group "become responsibly connected to the community and the society" through leadership activities that aim to bring about positive change; rests on an assumption of interdependence.
Change	The "ultimate goal of the creative process of leadership—to make a better world and a better society for self and others."

Source: Adapted from Higher Education Research Institute (1996). A social change model of leadership development: Guidebook version III, pp. 21-23.

An eighth value, change, is considered both the hub and the ultimate goal of the SCM (HERI, 1996). These values interact with one another across individual, group, and community domains, producing related feedback loops. (See Figure 2.1.) In other words, behaviors or actions exhibited at one level reinforce or challenge values at another level in a "continual process of learning and self-evaluation" (Dugan & Komives, 2011, p. 47). One example might be the ways in which engaging in group collaboration through a service project impacts an individual's understanding of self. (For more on these interactions, see HERI, 1996, pp. 24-26).

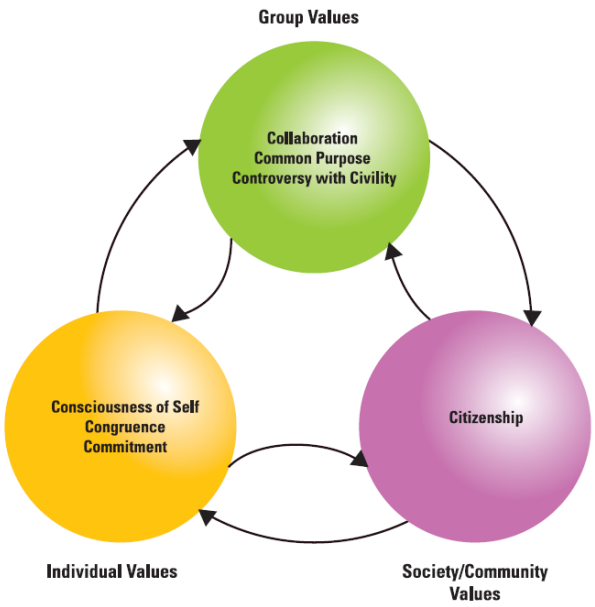


Figure 2.1. The Social Change Model of Leadership Development. Reprinted with permission from the National Clearinghouse for Leadership Programs.

The authors of the SCM explicitly embrace elements of the post-industrial paradigm, while retaining key elements of leader development models (Guthrie et al., 2013). Calling for transformational leadership to tackle confounding societal problems, the authors articulate a strong commitment to leadership as a values-based process accessible to all individuals who are committed to positive social change (HERI, 1996). Deemphasizing the role of positional leaders and promoting interdependent group process, the SCM empowers aspirational leaders and followers alike in a non-hierarchical framework (Kezar et al., 2006). In this way, the SCM enacts social justice, by making leadership accessible to marginalized communities. One shortcoming of the model, however, is its failure to specifically include values associated with cultural competence, which may alienate some of the very individuals who might otherwise be drawn to its goals of social change (Dugan & Komives, 2011; HERI, 1996).

Findings from Research Examining Student Leadership Development

Most empirical research on college student leadership development is a product of the 1990s and 2000s. Before then, just a handful of studies were published that examined student leadership "as more than a by-product of a college degree" (Dugan, 2011, p. 64). A chronological frame is most helpful here, in order to see how the research evolves toward the post-industrial paradigm, and begins to include a wider array of epistemological foundations.

Early Studies

Alexander Astin (1977, 1993b) is seen as the pioneer in this regard (Dugan, 2011). Astin used data gathered from the annual Cooperative Institutional Research Program (CIRP) survey of incoming freshmen to explore the ways in which college impacts student development. Analyzing the first ten years of CIRP data, Astin (1977) identified key predictors of whether a student would be elected to positional leadership or join a student-faculty committee; he equated these outcomes with recognized leadership ability. Astin (1977) summarized the positive predictors as depicting a "clear-cut stereotype of the potential leader: a bright, verbally aggressive, political activist aspiring to a legal career" (p. 116). In a later study, Astin (1993a) used CIRP data to create a typology of college students, which he then tested for concurrent and predictive validity using factor analysis. This typology comprised seven student types, one of which was called "the leader," and included individuals with "high self-ratings on popularity with the opposite sex, popularity in general, social self-confidence, leadership ability and public speaking ability" (Astin, 1993a, p. 40). To examine the profile of "leaders" as

Astin described them is like peering into a time capsule filled with industrial paradigm stereotypes. For instance:

> Leaders show a predilection for majors in prelaw, military science, and communications … tend to spend a lot of time in athletic activities, student organizations, and partying … [and] are *less* likely than other students to say that they frequently feel overwhelmed by all they have to do (Astin, 1993a, p. 43; italics in original).

Astin's early work has been criticized by contemporary scholars as atheoretical (Dugan, 2011). Yet in light of these findings, it is unsurprising that Astin would soon take a leading role in drafting the SCM (HERI, 1996), and in calling for major reforms across higher education in *Leadership Reconsidered* (Astin & Astin, 2000).

Two other early studies are noteworthy for uncovering some of the ways in which student leadership experiences were perceived retrospectively. Schuh and Laverty (1983) sent surveys to 76 alums who had held an undergraduate leadership position (e.g., student body president; fraternity leader; student newspaper editor) at three Midwestern universities as far back as 1950. Their aim was to gauge the perceived influence of student leadership experiences on selected life activities and skills. What they found was that alumni reported a significant impact from leadership roles in skill development (e.g., leadership, decision-making, assertiveness, and planning) and minimal impact on major life activities (e.g., marriage, career choice).

Whitt (1994) interviewed 200 female students, faculty, staff, and alumnae at three different women's colleges and found that these students were engaged in uniquely "feminine" leadership practices, including: "egalitarian and horizontal structures,

participatory governance, concern for individual circumstances, and alternative metaphors for organizing" (p. 201). Interestingly, such practices have been fully embraced within the post-industrial paradigm, which, though not explicitly gendered, has embraced stereotypical feminine qualities (Dugan, 2011). Whitt (1994) recommended that coed colleges and universities ensure a "pervasive institutional commitment to women," rather than consigning women to a single place (i.e., Women's Center) or to a single group (i.e., women faculty) for support and encouragement (p. 204). Simultaneously she encouraged the reintroduction of women-only leadership opportunities, which had been phased out by the 1970s because they came to be viewed as inferior to opportunities for men. These separate places, Whitt (1994) argued, should be viewed "*not* as retreats, but as greenhouses, as places where women can be planted in fertile soil and nurtured to full growth" (p. 205; italics in original). This difficult balancing act for college faculty and administrators—that is, to create a supportive environment for non-dominant groups of students replete with opportunities for both intra- and inter-group activities—plays out today across multiple groups of underrepresented minorities (Sidanius, Levin, Van Laar, & Sears, 2008).

Contemporary Research

More recent studies have examined leadership development and practices using a variety of data, including CIRP (e.g., Antonio, 2001; Cress, Astin, Zimmerman-Oster, & Burkhardt, 2001), the Student Leadership Practices Inventory (e.g., Komives, 1994; Posner & Brodsky, 1992, 1994), the Multifactor Leadership Questionnaire (e.g., Bass & Avolio, 1990; Dugan, Rossetti Morosini, & Beazley, 2011; Eagly, Johannesen-Schmidt,

& van Engen, 2003), or home-grown measures distributed on individual campuses (e.g., Rosch, Boyd, & Duran, 2014).

A host of studies have been grounded in the SCM, and rely on data collected through an instrument that measures leadership capacity across the social change values. Large-scale studies examining socially responsible leadership include the Multi-Institutional Study of Leadership (MSL), an international survey of college students that examines the impact of higher education experiences on student leadership development (Dugan, 2011), and the Wabash National Study of Liberal Arts Education, a longitudinal study examining a range of college outcomes (Pascarella & Blaich, 2013).

The research questions that will guide the present study pertain to relationships between student employment and socially responsible leadership capacity and self-efficacy for leadership. Therefore, greater attention will be paid in this section to findings from studies that have relied on MSL data. A full description of the MSL and related instruments, samples, variables, and psychometric properties are contained in Chapter Three (Dugan, 2015; Tyree, 1998).

Dozens of studies have examined socially responsible leadership over the past 10-15 years, many using MSL data. The National Clearinghouse for Leadership Programs (Dugan & Komives, 2007) presented highlights from the initial administration of the MSL, while Dugan, Komives, and Segar (2008) published the first peer-reviewed paper to discuss the main findings. Among the major results of the study, students were found to have reported the highest scores on individual domain values of the social change model (consciousness of self, congruence, and commitment) as compared with values associated with the group (collaboration, common purpose, controversy with civility) or

societal (citizenship) domains. Additionally, demographics, pre-college experiences, and select college experiences—including socio-cultural conversations, mentoring, campus involvement, community service, positional leadership roles, and formal leadership courses—each demonstrated strong relationships and, at times, predictive capacity with aspects of socially responsible leadership (Dugan & Komives, 2007; Dugan et al., 2008).

Digging further into data from the initial study, Dugan and Komives (2010) employed regression analyses with a sample of over 14,000 seniors who participated in the initial study. Among a range of college experiences that were measured utilizing hierarchical linear regression analyses, they found that socio-cultural conversations with peers (i.e., discussions between individuals with diverse backgrounds, values, and lifestyles), participation in community service, and mentoring relationships with faculty had the strongest influence on socially responsible leadership outcomes (Dugan & Komives, 2010).

Leadership self-efficacy—that is, the extent to which students believed in their capacity for effective leadership—also explained a significant amount of variance in SRLS scores. This finding affirmed research on the power of self-efficacy to determine future performance on a given task, and subsequent outcomes (Bandura, 1997; Hannah, Avolio, Luthans, & Harms, 2008). It is a crucial variable in the context of student leadership development, because the extent to which someone believes in their capacity to lead is a key factor in whether or not that individual eventually assumes a leadership position (Dugan, Garland, et al., 2008).

The impact of college experiences. The majority of studies examining socially responsible leadership have considered possible relationships between unique

experiences embedded within a college environment and leadership capacity or self-efficacy. Researchers have uncovered significant positive associations among a variety of college activities, including student-led clubs and organizations (Dugan, 2008a, 2013; Hogendorp, 2012); campus recreation activities (Dugan, Torrez, & Turman, 2014); military education programs (Wilson, 2009); and mentoring from faculty or student affairs professionals (Campbell, Smith, Dugan, & Komives, 2012; Early, 2014; M. Gleason, 2012; Martin, 2013). Several studies examined the possible impact of membership in a fraternity or sorority, with mixed results (e.g., Dugan, 2008b; Shalka & Jones, 2010). In one study noteworthy for its varied findings, Hevel, Martin, and Pascarella (2014) analyzed Wabash longitudinal data and found that initial gains in socially responsible leadership after first-year involvement in fraternities and sororities (Martin, Hevel, & Pascarella, 2012) had, in fact, lost their significance by senior year.

Two studies disaggregated MSL data to examine specific experiences for students in STEM majors (Dugan, Fath, Howes, Lavelle, & Polanin, 2013; Stephens & Rosch, 2015). Dugan et al., (2013) found that women in STEM majors report similar levels of leadership capacity as women in other majors. They report lower self-efficacy for leadership, however, despite having pretest scores for self-efficacy similar to their non-STEM peers at the start of college. Using a slightly different sample, Stephens and Rosch (2015) found little meaningful differences in leadership capacity or self-efficacy between engineering and non-engineering students.

When viewed in sum, these studies identify specific college experiences that relate significantly with socially responsible leadership capacity or self-efficacy, and in some cases explain a significant amount of variance between pre- and post-test scores on

measures of leadership. In other words, they describe the possible effect of unique college experiences on student leadership and, in so doing, affirm Astin's college impact model.

The impact of leadership courses. A handful of studies have examined the ways in which structured leadership courses impact student leadership development. Results are not uniformly positive. The earliest research on this question examined CIRP longitudinal data for 875 students across 10 institutions and determined that participation in leadership programs related significantly to gains in self-reported leadership skills, values, and cognitive understanding when compared with non-participants (Cress et al., 2001). From the initial wave of the MSL, Dugan and Komives (2010) found that short- and medium-length duration leadership courses predicted positive gains in several of the social change values, but that long-duration programs (i.e., leadership major, minor, or certificate programs) predicted lower capacity across several values.

Dugan, Bohle, Gebhardt, Hofert, Wilk, and Cooney (2011) looked deeper into these data, disaggregating all 16 student leadership experiences captured by the MSL, including conferences, retreats, positional leader training, courses, and leadership programs for specific groups of students (i.e., women, students of color). Interestingly, these experiences contributed little to socially responsible leadership outcomes beyond what was predicted by pretest measures. This led the authors to conclude that the presence of high-impact practices (see Kuh, 2008 for an in-depth discussion) in leadership programs likely has a greater effect on student learning than the specific type of program offered (Dugan, Bohle et al., 2011). This is a remarkable conclusion, one that should encourage co-curricular leadership educators to study and possibly rethink a host

of structured leadership programs that may have been assumed useful simply because they appear to be so.

More recently, several single-institution studies found significant, positive gains in leadership capacity for students enrolled in short-term leadership courses (Buschlen & Dvorak, 2011; Keating, Rosch, & Burgoon, 2014; Rosch & Caza, 2012). One of these (Buschlen & Dvorak, 2011) employed a quasi-experimental design, which is generally considered to be a stronger methodology than correlation or regression analyses. Yet the findings of Dugan, Bohle et al., (2011) must be given greater weight due to the nature of their sample (i.e., nearly 9,000 students from 99 institutions across the U.S.) and therefore the greater generalizability of their findings.

The impact of demographics. In the initial MSL study, significant differences were found across the social change values by racial group and sex (Dugan, Komives, et al., 2008). Of particular note, African-American participants reported significantly higher mean scores across four values (consciousness of self, controversy with civility, citizenship, and change) while Asian American participants reported significantly lower mean scores than other racial groups, except Native Americans, across five values (congruence, commitment, controversy with civility, citizenship, and change). Disaggregating by sex, women reported statistically significantly higher scores on all SCM values except change. With respect to both race and sex, these differences carried small, albeit significant, effect sizes (Dugan, Komives, et al., 2008). No meaningful differences emerged when comparing scores across students' sexual orientation.

The broader literature on sex-based differences in leadership paints conflicting pictures, depending on which conceptual model is guiding the research. A variety of

studies "support a female propensity" for leadership success (Dugan, 2011, p. 69) when using post-industrial conceptualizations of leadership (see Eagly et al., 2003 for a meta-analysis). By contrast, studies anchored in more industrial (i.e., leader-centric) philosophies or focused on leadership efficacy (e.g., Cress et al., 2001; Posner, 2009; Posner & Brodsky, 1994) found little difference in leadership outcomes by sex (Dugan, 2011). Importantly, most of the effects observed across participant sex are correlational, and become non-significant in more complex predictive models (Dugan, 2011).

Race is also a complicated construct in studies of college student leadership. Both quantitative and qualitative studies have found racial categories to be a significant predictor of leadership experiences and outcomes (Arminio et al., 2000; Dugan, Komives, et al., 2008; Komives, Dugan, & Segar, 2006). Other studies (Cress et al., 2001; Dugan & Komives, 2011) have found that race is not as significant as other factors. The most nuanced treatment of race to date can be found in two papers that move beyond the correlational or predictive capacity of racial categories and examine specific constructs or experiences related to race. For instance, Dugan, Kodama, and Gebhardt (2013) consider the relationships between socially responsible leadership and participants' collective racial esteem—a construct related to racial identity development—and found that it explains variance in outcomes on par with leadership self-efficacy, and outperforms racial categories significantly in its predictive power. A related study investigating leadership self-efficacy (Kodama & Dugan, 2013) stressed the importance of disaggregating data by racial categories; results varied significantly across these groups. For example, community service was a significant predictor for African American, Asian American and multiracial students, but not for White or Latino students.

This finding is important because community service has been shown to positively impact leadership self-efficacy in studies where participants were aggregated across racial categories (Dugan & Komives, 2010).

Given the nuances of gender and racial identity development and the ways in which students negotiate multiple identities (e.g., Abes, Jones & McEwen, 2007; Arminio et al., 2000; Komives, 1994; Whitt, 1994), it is imperative that future research consider these constructs explicitly when examining student leadership. This stance is supported additionally by the social justice foundations of the SCM, and the nature of social change more broadly (Dugan & Komives, 2011; Ospina & Su, 2009).

How students think about leadership. Beyond the qualitative papers addressed above (e.g., Komives et al., 2005), a small group of noteworthy studies has explored the ways in which students think about leadership and related identity development. Shertzer and Schuh (2004) conducted a series of focus groups with 24 students who held positional leadership roles and individual interviews with five students who were uninvolved in student leadership, in order to examine beliefs that could empower or constrain students from engaging in leadership opportunities. Their participants shared entirely industrial perceptions. For these students leadership is defined by, and indistinguishable from, positional leaders. Additionally, students generally presume that positional leaders are predisposed to hold leadership roles, and demonstrate particular skills and qualities "which set them apart from others" (Shertzer & Schuh, 2004, p. 118). The student leaders shared empowering beliefs that included a strong feeling of external support, opportunities to become involved, and a background that helped them develop leadership self-efficacy. Disengaged students doubted whether their intelligence and

personalities were a good fit for leadership roles. Interpreting these findings, the researchers suggested that the industrial nature of the campus culture at this institution was shaping student perceptions in the traditional paradigm.

Advancing a hypothesis that pre-existing beliefs such as the ones uncovered by Shertzer and Schuh (2004) can predict leadership outcomes, Caza and Rosch (2014) employed exploratory factor analysis with single-institution data from the MSL to uncover an underlying structure to pre-existing beliefs about leadership. They found four factors common to student beliefs about leadership, all reasonably representative of the post-industrial paradigm: leaders ought to serve their community, be open-minded, honor values, and be comfortable with change. Crucially, however, several aspects of the social change model failed to load onto student responses—consciousness of self, commitment, and several values related to collaboration and teamwork. This amplifies Shertzer and Schuch's (2004) finding and suggests industrial conceptualizations of leadership remain salient even among students engaged in formal leadership education.

Taken together, these studies have direct implications for faculty and staff who are responsible for shaping and communicating campus culture and belief systems about leadership. Specifically, student affairs administrators should attempt to influence students' beliefs about leadership early in the college experience. One important and uncomplicated step toward this goal is for administrators to regularly describe extracurricular leadership opportunities to potential student leaders using relational, process-oriented language from the post-industrial paradigm. Moreover, leader training and development programs should explicitly include discussion and activity around the leadership identity development model (Komives, Longerbeam, et al., 2006). Steps such

as these can help administrators begin to counter some of the industrial-era assumptions about leadership that the majority of students bring with them to college, and lay the groundwork for students to become transformational leaders among their peer group.

Aiming to understand the experience of student leadership from a phenomenological standpoint, Logue, Hutchens, and Hector (2005) interviewed six student leaders at a single institution. They found that a positive experience was "common ground" across all participants, each of whom reported enjoying various aspects of their leadership role (Logue et al., 2005, p. 398). The stories shared by participants coalesced as three main themes—people, action, and organization—each with their own sub-themes. While not attempting to generalize their findings, the authors concluded that for these students the leadership experience affected their perception of college more broadly as well as related developmental tasks (Logue et al., 2005). In a similar study, Hall, Forrester and Borsz (2008) interviewed 21 student leaders involved in campus recreation programs to better understand their unique experiences. Themes that emerged from these data suggested students perceived an exposure to multiple challenges in skill development, including: organizing and planning; problem-solving and decision making; motivating and influencing others; communication; and giving and receiving feedback.

Finally, one relevant study explored the ways in which student leaders in identity-based groups made sense of emerging psychosocial and leadership identities (Renn & Ozaki, 2010). Researchers interviewed 18 students—eight leaders from LGBT affinity groups, and 10 from other groups explicitly organized around racial, ethnic, or gender identity—and two interesting findings emerged. The first is that LGBT group leaders

described an experience of identity development that merged psychosocial and leader identity components (e.g., a student who defines herself as a "queer activist") while leaders from other identity groups experienced development along parallel paths (e.g., a student who defines herself as a feminist and a leader, but not a "feminist leader") (Renn & Ozaki, 2010, p. 18). The second finding of note is that only five of the 18 students in the sample seemed to have advanced beyond stage three of the LID model (Komives, Longerbeam, et al., 2006); the remainder viewed leadership as something that is done by positional leaders (Renn & Ozaki, 2010). Since the sample was composed entirely of student organization leaders, these findings suggest that formal leadership development programs can help students who have already attained leadership roles make the cognitive leap in developing multiple identities along either parallel or merged paths.

An Epistemological Post-script

Revisiting the discussion above about research epistemology is appropriate at this juncture. Many of the findings discussed in the prior section rest on positivist assumptions of objective truth and generalizability of knowledge. For faculty and staff comfortable with this way of knowing, these studies have identified specific environmental factors where they are likely to have the most influence on student leadership development. However, for others who subscribe to post-positivist epistemologies, these studies ignore the notion that the very constructs being examined may not exist in any objective sense, or cannot be analyzed apart from surrounding systems of oppression. The few constructivist studies addressed above suggest that students in positional leadership are actively reflecting on their contextualized experiences, and making meaning from the challenges they confront. Staff advisors and

supervisors should capitalize on these findings by facilitating discussions where student reflections are validated, amplified, or challenged by post-industrial leadership theory. These epistemological assumptions must continue to be made explicit when analyzing, interpreting, or applying the results of these studies, in order to ensure that leadership remains transformational for individuals and groups without access to conventional systems of power and influence.

Gaps in the Literature

The main problem with the literature is that strong evidence exists that scholars have shifted their conceptualizations of leadership toward a post-industrial epistemology, while weak evidence suggests that students have not. To bring theory and practice into greater alignment, the literature addressing the ways students conceptualize leadership must move beyond its infancy. Several studies discussed above have uncovered student perceptions through qualitative methods (e.g., Logue et al., 2005; Renn & Ozaki, 2010; Shertzer & Schuh, 2004), and though rich in detail, they lack generalizability due to sample size. Quantitative methods should be used to enhance or challenge the limited evidence that student beliefs are rooted in the industrial mindset. In fact, a handful of studies have addressed pre-existing beliefs about leadership using quantitative methods, although these too have visible shortcomings, either in sample composition (Wielkiewicz, 2000), or the failure to consider student perspectives in their own words (Caza & Rosch, 2014)

Haber (2011, 2012) conducted the strongest study to date that addresses this gap in the literature. Using MSL 2009 data, she employed content analysis to uncover student perceptions of leadership, and coded them using themes present in the leadership studies

literature. She also investigated differences in perceptions across demographic categories (i.e., gender, race, and age) and relationships between themes and college experiences. The importance of this study is that Haber (2012) found students' views of leadership are more "hierarchical and leader-centric" and therefore less compatible with the values of the social change model (p. 41). This finding echoed those of earlier studies (e.g., Shertzer & Schuh, 2004; Wielkiewicz, 2000). The problem with Haber's (2012) study is that she developed thematic categories deductively, relying on the extant literature, and selected a sample size (1,100 students) specifically to facilitate one type of multivariate analysis. The present study, as described in greater detail in Chapter Three, will engage with data provided by all respondents and subsequently develop themes inductively. Furthermore, while a series of authors has examined the ways in which college experiences affect students' leadership capacity, only one study (Salisbury et al., 2012) was designed to assess the particular impact of student employment. This is a notable absence from the literature, as work is both a common and unifying experience among the majority of undergraduates.

Summary of Leadership Theory and Research

The purpose of liberal education, according to Robert Greenleaf (1977), is "to prepare students to serve, and be served by, the present society" (p. 184). This mission of preparing future citizen-leaders is embedded within many of the learning outcomes that unify an otherwise disparate system of higher education in the U.S. (AAC&U, 2007; CAS, 2015). A new paradigm in leadership studies emerged as scholars considered the need for a new framework within which to tackle contemporary problems (Astin & Astin, 2000; Rost, 1991). Industrial theories, which focused on key traits, behaviors, or

situations within which positional leaders could manage change effectively, have given way over time to post-industrial theories, which envision transformational leadership. A transformational leader is one who empowers followers, appeals to their sense of higher purpose, and inspires collective action that transcends the individual and moves an organization toward a common goal (Bass, 1985; Kezar et al., 2006; Northouse, 2016; Rost, 1991).

Post-industrial leadership theory has provided guidance to faculty and staff who have investigated the ways in which college students develop leadership identity, capacity, and self-efficacy. The social change model stands out as a theoretically-grounded, applied model that is accessible to the entire college community. The literature on college student development is replete with studies that rely on the SCM as a theoretical framework and Astin's I-E-O model as an empirical framework. This robust body of research and theory has identified important relationships between socially responsible leadership and precollege characteristics, demographic traits, and specific college experiences.

Noteworthy investigations have uncovered varying outcomes when disaggregated by race, and explored the ways in which students conceptualize the leadership experience and its impact on their personal development. A series of studies has questioned the impact of courses that purport to teach leadership skills, with findings that carry tremendous implications for faculty and staff who design, teach, and evaluate such programs. Leadership self-efficacy has been shown to predict whether a student becomes a leader, and impacts subsequent self-reported leadership capacity; this knowledge helps to ensure that leadership education includes a focus on individual belief systems.

Given the urgency with which colleges need to develop effective leaders, it is vital for faculty and staff to translate these findings into practice. It is equally important for researchers to continue investigating the impact of previously unexamined experiences such as student employment on leadership outcomes, and to understand the ways in which students conceptualize leadership, as pre-existing beliefs have demonstrated the ability to predict and influence related attitudes and behaviors related. The following sections will describe the population of working students, the reasons why students work, and what is known about its effects on college outcomes. Shortcomings in the student employment literature will be addressed as well, and this review will conclude with a brief explanation of how this study will bring together two fields that have a strong association with one another but often are not discussed simultaneously.

Part II: Who Are Working Undergraduates Today?

Two decades ago, Kincaid (1996) referred to paid work as "the most universal experience of American college students" aside from class attendance (p. 3), and there is little question today that work remains a "fundamental part of life" for a sizable population (Perna, 2010, p. xiii). According to the most current data compiled by the Census Bureau, 41 percent of full-time undergraduates and 80 percent of part-time undergraduates work for pay while enrolled (Snyder et al., 2016). Scholars who examine workforce participation believe that these numbers are somewhat depressed due to lingering effects of the economic recession, and therefore student employment may expand to reach a majority of the population of full-time students (Carnevale et al., 2015). Indeed, as recently as 2000, 52 percent of full-time and 85 percent of part-time undergraduates held paying jobs (Kena et al., 2016). The amount of time students spend

working is significant. According to a recent time-use survey conducted by the Bureau of Labor Statistics (2015), full-time students spent on average 2.4 hours of each weekday at work or related activities, eclipsed only by time spent asleep (8.7 hours), engaged in leisure and sports activities (4.1 hours), and pursuing educational activities (3.3 hours).

The current percentages of students working are fairly in line with historical expectations about part-time work, as captured by the annual CIRP survey of incoming first-year students. Since 1976, between 35-49 percent of incoming students reported it was very likely they would take on a job to help cover the cost of college; since 2000 that number has not dipped below 42 percent (Eagan, Stolzenberg, Ramirez, Aragon, Suchard, & Rios-Aguilar, 2016). Full-time students worked, on average, 26 hours each week during the 2011-12 academic year, while part-time students worked an average of 33 hours per week (Skomsvold, 2014). Despite the fact that full-time students seem to be working more than part-time hours on average, nearly three times as many undergraduates (43 percent compared with 15 percent) consider themselves students working to meet expenses, rather than employees enrolled in school (Skomsvold, 2014). One possible explanation for such a strong adherence to a student identity is that six in 10 working undergraduates report holding "transitional" jobs—including positions in sales and office support, food, and personal services—that are unrelated to long-term career goals (Carnevale et al., 2015, p. 27).

Why Do Students Work?

Financial Considerations

Students choose to work for a variety of reasons, the most obvious being to help pay for educational expenses (Carnevale et al., 2015). The College Board noted that

2015-16 tuition and fees were 40 percent higher at public four-year institutions and 26 percent higher at private nonprofit four-year institutions than they were in 2005-06, after adjusting for inflation (College Board, 2015a). Contextualizing these increases in cost alongside changes in the broader economy, it becomes clear that part-time work is a necessary piece of a larger financial aid strategy for many, if not most, students. To start, statistics compiled by the Census Bureau demonstrate that anemic wage growth has been far outpaced by growth in tuition and fees. Specifically, median household incomes in 2015 were 1.6 percent lower than they were in 2007, and 2.4 percent lower than their peak in 1999 (Proctor, Semega, & Kollar, 2016).

Several factors that are less well-known outside higher education are important to consider when exploring financial motivations to work. The first is the slow but steady shifting of costs for higher education from the state to students and families (Slaughter & Rhoades, 2011). A second factor is the falling value of the Pell Grant. Although greater numbers of students now have access to the Pell Grant, the maximum award of $5,645 covers just 61 percent of average tuition and fees at a four-year public institution, and a paltry 18 percent at four-year private institutions (College Board, 2015b). A third factor is the overall reduction in per-student borrowing. Although the number of students who borrow is increasing, the average amount borrowed has shrunk. According to the College Board (2015b), students and families borrowed 14 percent less in 2014-15 than they had four years earlier. It is reasonable to suspect that some students seek to offset this reduction in borrowed funds with increased earned income (Perna et al., 2006). A fourth and related factor is a reduction in parental transfers of funds. Using national longitudinal data, Kalenkoski and Pabilonia (2010) demonstrated that as parents provide less direct

support, their students increase the number of hours they work. In fact, some students are supporting their families financially, which compounds this problem (Goldrick-Rab, 2016).

Many students work because they were granted work-study funds as part of their financial aid package. The federal government relies on information that each student provides through the Free Application for Federal Student Aid (FAFSA) to determine an expected family contribution (EFC) and eligibility for a range of financial aid, including the Pell Grant, subsidized and unsubsidized loans, and campus-based aid (Perna et al., 2006). The Federal Work Study (FWS) program is one of three types of campus-based aid, alongside Federal Supplemental Education Opportunity Grants and Federal Perkins loans, that is funded by Congress but administered locally on each campus rather than through the U. S. Department of Education (Perna et al., 2006). The FWS program has provided around $1 billion each year since 1964 to subsidize student employment on-campus or in local community service programs (Scott-Clayton & Minaya, 2015).

According to federal data from 2011-12, just over 5 percent of all students received a work-study allotment (Paslov & Skomsvold, 2014), which translates roughly to around 700,000 students (Scott-Clayton & Minaya, 2015). The average award amount was $2,200. These averages should be interpreted with caution, however, as they mask strong heterogeneity across institutional type. For example, the percentage of students receiving a FWS allotment at four-year private non-profit institutions (21.4 percent) is four times the national average. Also, the average award amount at two-year for-profit schools ($3,700) is nearly 70 percent larger than the national average (Paslov & Skomsvold, 2014).

A related piece of the financial aid equation reflects whether a student's family is unable or unwilling to contribute the EFC determined by federal formula. Goldrick-Rab (2016) finds fault with the formula, which she believes "ignores debt" and "grossly understates the actual costs of attending college" therefore leading to an unrealistic EFC (para. 4). Perna et al. (2006) reflects on parental willingness to pay, citing one study that suggests an inverse relationship between a student's choice to work and her parents' ability or willingness to assist in financing their child's education, and several studies that suggest parental willingness to contribute varies across racial/ethnic groups. Students also may prefer not to borrow to pay college costs, or choose to work to maintain specific lifestyle choices (Perna et al., 2006).

Skill Development

Students also obtain jobs to build general and specific skills, and to prepare for future careers. For instance, while on the job students increase their capacity to build relationships and receive feedback from peers or a supervisor, as well as improve their time management, communication, and conflict resolution skills (Carnevale et al., 2015; Empie, 2012; Watson, 2013). Many of the competencies that students sharpen in even the most mundane jobs have come to be considered the "soft skills necessary for success in the workforce" (Carnevale et al., 2015, p. 15). Work can complement or reinforce classroom learning, offer direct experience in specific tasks that could only be learned on the job, and assist students in building a network of contacts and demonstrated experience in their chosen profession (Carnevale et al., 2015; Mulugetta & Chavez, 1996). Longitudinal research on professional nurses, accountants, and engineers confirms that key knowledge, skills, and abilities are learned in the workplace and that formal learning

environments may supplement but cannot replace this situated learning (Eraut, 2007). Therefore to ensure colleges and universities are producing more and better leaders, environments where students obtain paid work are ripe for informal training in contemporary leadership practices.

As one example, cooperative education (co-op) programs are an ideal off-campus work environment, likely due to the ways in which they combine "classroom-based education with practical work experience" (Cooperative Education & Internship Association, n.d., para.12). Given the explicit curricular connection, faculty, staff, and co-op employers can work together to locate workplace experiences within which post-industrial leadership can be modeled and nurtured.

Although distinctive in their employer-employee relationship, the experiential learning environment inherent in co-ops is comparable to what is often found in internship settings. Internships are considered a "high impact" practice in higher education (Kuh, 2008), and evidence has shown that students who complete paid internships receive job offers at a higher rate and earn almost 50 percent more in starting salary than those who did not complete an internship (Carnevale et al., 2015). Thus, the incentives are clear for students to participate in some type of formal work experience in their desired field. Unpaid work experiences are beyond the scope of the present study and should be examined in future research. Irrespective of whether students are working for pay, faculty, staff, and employers should ensure that leadership theory and practice align in these workplaces.

What Impact Does Work Have on Students?

An impressive array of studies investigating the impacts of student employment has been conducted over the past half century, and yet, surprisingly, there remains little consensus in the field. In a wide-ranging and impressive review of the literature on student employment in higher education, Riggert et al. (2006) determined that prior review papers were inconclusive in their estimation of positive or negative effects, and noted a present landscape of empirical studies "marked by diversity and contradiction" (p. 69). This finding has been echoed by others as well, who depict an area of scholarship noteworthy for its limited reach and ambiguous or contradictory findings (Perna et al., 2006; Salisbury et al., 2012).

Academic Outcomes

Concerns abound that work is keeping students from studying or engaging in other educationally-purposeful activities (Mayhew et al, 2016). This fear is supported by time-use data captured by the federal Bureau of Labor Statistics (2015), as previously described. Given this finding, it should come as little surprise that the vast majority of researchers in this field have sought to examine the impact of work on academic outcomes, including grades, GPA, credits earned, and academic involvement. More surprising, perhaps, is that these anxieties are not empirically validated. As it turns out, "most research suggests that working is unrelated to grades" (Perna et al., 2006, p. 21). This finding is sustained across many studies, stretching back almost a half-century, which examined the question using either national datasets or single-institution samples (Chavez & Mulugetta, 1994; Darolia, 2014; Ehrenberg & Sherman, 1987, P. Gleason, 1993; Hammes & Haller, 1983; Henry, 1967; Lundberg, 2004; Scott-Clayton, 2011;

Stern & Nakata, 1991; Van de Water & Augenblick, 1987). Similarly, in summarizing findings across a number of studies, Mayhew et al. (2016) concluded that working "does not hinder student verbal, quantitative, or subject matter competence" (p. 83).

Scholars have noted that work negatively affects academic outcomes more frequently among students who work greater numbers of hours (Astin, 1993b; DeSimone, 2008; Hay & Lindsay, 1969; Pike, Kuh, & Massa-McKinley, 2008; Riggert et al., 2006). Researchers at Indiana University analyzed data from the 2004 administration of the National Survey of Student Engagement (NSSE) and found that the grades of first-year students who worked 20 hours or less per week were largely similar to the grades of peers who did not work. By contrast, students who worked more than 20 hours each week reported lower grades (Pike et al., 2008). A follow-up study that looked at results from the 2008 NSSE found that on-campus work up to 10 hours per week was associated with higher self-reported grades, while more than 20 hours of work per week was related to lower grades (McCormick et al., 2010). Negative academic outcomes also appear more regularly among students who work off-campus (Astin, 1993b; Ehrenberg & Sherman, 1987; Pike et al., 2008). For example, after reviewing decades of CIRP data, Astin (1993b) concluded that the effects of holding a part-time job off-campus were "almost identical" to the overwhelmingly negative outcomes suggested for students working full-time (p. 388).

Persistence and Degree Completion

Work appears to have more consistently negative effects on persistence and completion. Pascarella and Terenzini (2005, p. 414) summarized the findings of at least two dozen studies that have examined relationships between hours worked and

persistence, and concluded that the more hours students work, the more likely they are to shift from full- to part-time—in other words, increasing their time to degree—and the less likely they are to persist year-to-year or graduate with a bachelor's degree (Astin, 1993b; Ehrenberg & Sherman, 1987; Furr & Elling, 2000; P. Gleason, 1993; King & Bannon, 2002; Stern & Nakata, 1991, Van de Water & Augenblick, 1987). The picture becomes more complex when students are disaggregated by work location, as some research suggests that limited on-campus employment may, in fact, positively impact persistence (Astin, 1993b; Horn & Malizio, 1996; Mayhew et al., 2016; Pascarella & Terenzini, 1991). For instance, in contrast to his findings mentioned above for students working off-campus, Astin (1993b) found almost uniformly positive outcomes for students who held part-time jobs on-campus.

The current consensus appears to be that the relationship between persistence and hours worked is u-shaped (Mayhew et al., 2016). Specifically, students who work fewer than 15 hours per week on-campus appear more likely to persist toward graduation than either students who work more than 15 hours per week or students who do not work at all (Horn & Malizio, 1996; Pascarella and Terenzini, 2005; Riggert et al., 2006). Perna et al. (2006) provides theoretical evidence for this hypothesis in the form of Tinto's (1993) model of voluntary attrition. Students who work a limited number of hours, especially on-campus, increase their opportunities for integration and affiliation with their institution and thereby subsequently reduce their likelihood of future withdrawal.

Student Involvement and Engagement

Astin (1984) defined involvement as the level of energy students devote to college activities and suggested that those who are more involved learn more during their time in

college. Several studies have indicated that work interferes with student involvement in academically-related activities, including study time, meeting with faculty, selecting courses, and accessing the library (Astin, 1993b; Furr & Elling, 2000; Horn & Malizio, 1996; Lundberg, 2004; Pascarella, Bohr, Nora, Desler, & Zusman, 1994). However, as Salisbury et al. (2012) noted, these papers have not managed to demonstrate relationships between reduced involvement and diminished academic performance, which suggests that the two constructs may be further apart than previously hypothesized (Astin, 1984). The examination of 2008 NSSE data mentioned above presents a confounding picture that, in sum, supports the assertion by Salisbury et al. (2012). In addition to finding lower grades among those who worked more than 20 hours each week, positive relationships were evident between work and specific dimensions of student engagement, including active and collaborative learning and student-faculty interaction, among all working students (McCormick et al., 2010). Even more surprising, the researchers found stronger positive effects among students who worked more than 20 hours per week on campus. Future research is needed in this area to more carefully discern the differential impacts of work on student involvement and student engagement, two closely-related constructs.

Identity Development

A small body of research has examined relationships between work and identity development across domains that are related, though ancillary to academic performance. Pascarella et al. (1994) first explored the effects of work on cognitive development in a small, single-institution sample. Participants completed measures of reading comprehension, math ability, and critical thinking skills at the beginning and end of the 1991-92 academic year, and researchers found no significant differences in scores among

those students who worked on-campus, off-campus, or did not work at all. Building on this study, Pascarella and colleagues conducted a three-year longitudinal study of working students across 23 colleges and universities. Results were largely the same, suggesting that "on- or off-campus work may not consistently inhibit cognitive or intellectual growth during college" (Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1998, p. 89). Summarizing these and other studies, Pascarella and Terenzini (2005) concluded that work likely has no more than a "trivial impact" on cognitive development (p. 197). Mayhew et al., (2016) largely avoided a judgment on more current research, citing mixed results from studies that included work variables only peripherally.

Work rarely figures in studies examining psychosocial change, however Padgett and Grady (2009) identified a handful of studies that establish preliminary relationships among working students and constructs including self-esteem and career motivation. Chickering, Frank, and Robinson (1996), building from Loevinger's framework of ego development, proposed that college student employment programs should intentionally frame challenge and support mechanisms for students across work setting, job characteristics, and evaluation methods that respect each individual's developmental trajectory. Similarly, limited research has examined relationships between work and moral development. As described by Pascarella and Terenzini (2005), two studies from the mid-1990s suggested that off-campus employment has a negative effect on moral-ethical behavior and participation in community service. Cruce and Moore (2006) refuted this finding in part with an examination of NSSE data from 2004 and 2005. Investigating predictors of volunteerism in first-year students across 623 institutions, they found that both on- and off-campus work increased the odds that a student would participate in

community service activities. Looking at another behavior commonly associated with lower levels of moral development, Padgett and Grady (2009) also cited two studies that suggested students who work are less likely to cheat.

Skill Development and Post-College Outcomes

Researchers have only recently begun to investigate empirically the ways in which work relates to skill development. The predominant focus among researchers in this area has been the constellation of benefits related to career development (e.g., Carnevale et al., 2015; Cheng & Alcántara, 2007). Several studies uncovered positive relationships between part-time work and postgraduate salary using national datasets. Stern and Nakata (1991), after reviewing federal data on working students from 1959 through 1986, concluded that students who work earn more money in the first few years after graduation. Two additional researchers came to similar conclusions after examining federal longitudinal data from the late 1960s and early 1970s; these studies are noteworthy as they capture outcomes for the earliest cohorts eligible to participate in the Federal Work Study program (Stephenson, Jr., 1982; San, 1986). A third study (P. Gleason, 1993), relying on federal High School and Beyond data from the early 1980s found that "students who worked a substantial amount in college tend to earn higher wages, work longer hours, and be employed a larger percentage of months in the first year or two after graduation" (p. 13). Pascarella and Terenzini (2005), in reviewing literature from the 1990s and early 2000s, stated unequivocally that students who work or participate in internship experiences during college "significantly enhance the likelihood of gaining employment immediately after graduation … and of gaining employment

appropriate to a bachelor's degree" (p. 520). A recent study affirmed a similar finding specific to students holding FWS jobs (Scott-Clayton & Minaya, 2015).

Leadership Development

Two recent studies suggested that paid work can have positive effects on the development of leadership capacity (Salisbury et al., 2009, 2012). The researchers sought to examine the impact of work on a variety of liberal arts outcomes in the initial study. Leadership outcomes, which were among the only significant findings, became the focus of the second study. Identical samples were drawn from the Wabash National Study of Liberal Arts Education, a longitudinal investigation of students at mostly liberal arts institutions. Examining both direct and indirect effects of work among 2,931 first-year, full-time undergraduates from 19 institutions, the authors found, contrary to much prior research, that off-campus work in excess of 10 hours each week appeared to impact leadership outcomes positively, while on-campus work had little effect. Salisbury et al. (2012) theorized that students may develop important skills—as in this case, leadership capacity—more effectively off-campus despite any concomitant reduction in on-campus involvement. This view contradicts the precepts of Astin's (1993b) long-dominant involvement theory, and challenges student affairs practitioners to avoid reflexive dismissal of any developmental potential in off-campus experiences. However, the authors acknowledged that their sample is not representative of the broad population of working students, which limits the generalizability of the findings. Further research is required to validate or refute these findings, as they are the first to explicitly link paid work and student leadership development.

What are the Gaps in our Understanding of Working College Students?

Conceptual oversights and statistical shortcomings plague much of the research on working college students. It is important to discuss these at some length to understand how problems originate in the extant literature and what can be done to improve future studies.

Modeling Concerns

At the outset, investigations of student work are susceptible to problems of endogeneity (Perna et al., 2006; Stinebricker & Stinebricker, 2003; Triventi, 2014). In other words, working students can be "systematically different" from non-working students in some way that cannot be controlled for methodologically or statistically (Triventi, 2014, p. 4). As one example, students choose how many hours they want to work, and this decision may be driven by heterogeneity in motivation (i.e., highly motivated students succeed academically and also work greater numbers of hours) or some other unobserved characteristic at the individual level (Stinebricker & Stinebricker, 2003). If these person-level factors are not included somehow in a statistical model, results may be biased.

Moreover, Riggert et al. (2006) determined in a comprehensive review of the student employment literature that modeling decisions offer a primary explanation for the variation in outcomes among many studies of working students. Unclear variable definition, atheoretical decisions about aggregation and disaggregation, liberal use of control variables and techniques, and unexamined multicollinearity among predictor variables are just some of the factors that can lead to questionable results (Riggert et al., 2006). For instance, several researchers have demonstrated that outcomes vary based on

whether or not a job is congruent with a student's major or career interests (Aper, 1994; Luzzo, 1996; Stern & Nakata, 1991). Not all studies can control for this factor, yet its absence may in fact be problematic. Salisbury et al. (2009) succinctly summarized the impact of this problem on the field by suggesting that student employment "could affect college students positively, negatively, and not at all—simultaneously" (p. 10).

Unaddressed Variation in Employment Experiences

One established convention in studies that examine the effects of work is to categorize workplace as on-campus or off-campus. Inferences about quality of work are made from this binary variable (Nuñez & Sansone, 2016), and as addressed above much has been made of the variation in outcomes that seemingly adhere to students who work in one location as opposed to the other. However, what remains unaddressed is an exploration of differential outcomes based on type of job, and a subsequent determination whether certain jobs are "more beneficial" for students to hold (Riggert et al., 2006, p. 86). Furthermore, location-specific heterogeneity must also include workplace-specific tasks wherein learning is thought to accrue, such as observation, collaboration, problem solving, supervision, and reflection (Eraut, 2007; Lewis, 2010). Preliminary evidence indicates that students experience greater fulfillment once they progress beyond entry-level jobs where they may feel "bored and useless" to positions with enhanced responsibilities (Cheng & Alcántara, 2007, p. 306). It is reasonable, therefore, to suppose that variation in workplace experiences across diverse workplace environments may plausibly relate to variation in outcomes, yet no peer-reviewed study to date has attempted to measure the effects of work while accounting for these differences. One recent dissertation study (Savoca, 2016) has nodded in this direction, through an

examination of differential impacts of work on academic success and retention, based on whether an on-campus position was structured to be "high impact," referencing Kuh's (2008) model of high-impact practices. Although no significant main effects were found for job type, this type of study is beginning to address this particular shortcoming in the literature.

Few Studies Examine Working Students' Self-Reported Experiences

Only a handful of qualitative studies have investigated the ways in which students describe their experiences with work; most are unpublished dissertations that offer nuance and depth to the conversation but lack the authority of peer-reviewed literature (Empie, 2012; Ketchum-Cifti, 2004; Watson, 2013). A national examination of the FWS program found that 8 in 10 respondents believed they had learned important skills like time management and good work habits through their jobs (Troppe, 2000). Two recent studies probed more deeply into working student perceptions and merit further discussion. In the first, Cheng and Alcántara (2007) adopted a grounded theory approach in focus groups with 14 working undergraduates and aimed to highlight relationships between work and college experiences, rather than examine the impact of work per se. Students in their sample reported a variety of benefits to working beyond pure financial gain, including job-searching and other career competencies, access to professional networks, and improved self-discipline and self-confidence (Cheng & Alcántara, 2007). Overall, these students suggested work is a meaningful part of their daily rhythms.

A second study highlighted the ways in which work helps first-generation Latino college students attain "various forms of capital beyond financial capital ... [including] human, social, cultural, navigational, and, to a lesser extent, resistant capitals" (Nuñez &

Sansone, 2016, p. 106). Participants described important skills they developed, including time management and study skills, and the opportunity their jobs provided to increase their sense of belonging. Similar to the findings of Cheng and Alcántara (2007), working undergraduates in this study convinced the researchers that they enjoyed their work intrinsically (Nuñez & Sansone, 2016). These studies validate Riggert et al.'s (2006) conclusion that future research should examine the impacts of work on a broad range of student outcomes beyond grades or persistence. Moreover, research that examines student perceptions of work, such as the above-cited dissertations, must be subjected to the rigors of peer review, both to enhance the extant literature and to ensure that constructivist epistemologies are contributing to the development and refinement of theories about working students.

The Present Study

The present study sits at the nexus of the two bodies of literature discussed in this review—student leadership and student employment—and aims to address shortcomings in each. The primary objectives of this study are to identify significant relationships between paid work experiences (i.e., location, hours worked) and leadership capacity and self-efficacy, and to explore working students' beliefs about leadership. This study will build on recent investigations that suggest relationships between paid employment and leadership outcomes (Salisbury et al., 2009, 2012).

The problems in the existing literature can be summarized as follows: First, the research on student leadership development fails to articulate students' own beliefs about leadership adequately; hence it is difficult to establish whether current leadership theory and practices are in close alignment. The few studies that have attempted to do so capture

the reflections of a small sample, which produce results that are nuanced but not generalizable. Uncovering perceptions of leadership among working students will allow for a determination of whether industrial or post-industrial thinking is dominant among a population who are absorbing lessons in leadership routinely through time spent in the workplace. Second, the research that examines the impact of work on college students uses a reductive method to isolate variation by its location on-campus or off-campus. This analytic strategy masks plausible diversity in on-the-job experiences and student outcomes.

The following chapter will describe the methods in greater detail. In brief, I will rely on Astin's (1993b) college impact model as an empirical framework and perform secondary analysis on existing data. First, I will investigate the beliefs of working college students about leadership from a 2015 national sample drawn from the Multi-Institutional Study of Leadership. Second, I will analyze these findings in relation to the extant literature and compared to perceptions of peers who are not employed while in college. Third, I will examine relationships among beliefs, workplace environment, control variables, and leadership capacity. Finally, I will explore both main effects for work on leadership capacity and interaction effects across workplace location and number of hours worked per week. I will employ an innovative method in education research—text mining analysis—to examine students' beliefs about leadership and descriptive and predictive analytic tools to investigate the impact of work on leadership capacity across varied workplace locations. Furthermore, modeling decisions will be made carefully and grounded in existing theory. Limitations of this study include the self-reported nature of

MSL data, and an inability to explore variation in leadership capacity across diverse off-campus workplaces.

An examination of relationships among working students' experiences, leadership capacities, and conceptions will address multiple shortcomings in these bodies of knowledge, and facilitate more effective leader development among the sizable population of students who work. Specifically, faculty and staff can use the findings of this study to shape on- and off-campus paid work experiences for undergraduates, as well as curricular and co-curricular messaging about the nature of leadership itself, to produce more and better leaders who are prepared to tackle contemporary social problems.

Chapter Three: Methods

Scholars in higher education have long assumed that paid employment takes students away from learning opportunities. However, as described in chapter two, work is neither monolithic nor necessarily detrimental to student development. In fact, the developing literature suggests that students may improve certain knowledge and skills across a variety of domains through paid employment. Researchers have only just begun to explore the ways in which work influences leadership development, although the picture is incomplete. Noticeable shortcomings and contradictions in the literature provide the foundation for the current study. Specifically, not enough has been done to understand the ways that working undergraduates think about leadership, and only preliminary investigations have explored relationships between paid employment and leadership development. What follows is a detailed explanation of the methods that shaped the present investigation.

Research Questions

This study aimed to answer the following overarching research question: How do college students' paid work experiences relate to their leadership capacity and beliefs about leadership? Three additional questions guided the study design and analyses:

1. Among a national sample of college students, what are the characteristics of students who work for pay while enrolled?
2. Do significant associations exist between aspects of the work experience and self-reported capacity or self-efficacy for leadership?
3. Among a national sample of college students, is work status associated with variation in how students conceptualize leadership?

Empirical Framework – Astin's I-E-O model of college impact

Astin's (1993b) input-environment-outcome (I-E-O) model of college impact was used as an empirical framework. Researchers who adopt the I-E-O model attempt to describe the ways in which college experiences impact student development by obtaining measures of student characteristics when they enter college; a detailed understanding of the educational programs and services unique to a particular college; and measures of student characteristics after a year or more of interaction within this environment. Comparing outcome and input characteristics allows researchers to assess student growth relative to environmentally-specific experiences. Input characteristics include pretests, precollege experiences, and demographic characteristics. Environmental variables include the wide array of programs and services delivered through the curriculum or co-curriculum, as well as characteristics specific to each institutional setting. Outcome variables include, for example, critical thinking ability, domain-specific knowledge, specific skills, or post-college achievements (e.g., employment, salary).

Astin (1993b) designed a taxonomy of outcomes to guide researchers who investigate the impact of college. First, a range of outcomes that reflect both cognitive and noncognitive (i.e., affective) dimensions of the student experience should be examined. Second, data that are relevant to these outcomes will be either psychological (i.e., internal) or behavioral (i.e., observable) in nature. Finally, both short-term (i.e., during college) and long-term (i.e., after college) effects should be investigated.

Astin's (1993b) I-E-O model is typically implemented through longitudinal design, which allows time for students to be exposed to distinct environmental variables. In MSL studies, including the one described here, this conceptual model is modified to

reflect a cross-sectional design. Specifically, input and outcome characteristics are captured from participants at the same time, and change is ascertained by comparing the two sets of scores on a variety of scales. For example, participants are presented with a four-question measure and asked to consider their self-efficacy for leadership while in high school. The identical measure appears later in the survey, this time with a prompt that asks respondents to focus on their experience of self within a collegiate context.

The modification of Astin's framework responds to the problem of response shift bias, which has the potential for contaminating self-reported data (Howard & Dailey, 1979; Rohs, 2002; Rohs & Langone, 1997). Several studies on leadership outcomes have compared self-reported data from pre-post (i.e., time-elapsed or longitudinal) and then-post study designs, and found the latter carrying greater validity due to more accurate pretest ratings. Then-post designs ask participants to respond twice to the same question in a cross-sectional survey—one prompt asks for a retrospective account of attitudes or behaviors prior to a specific intervention, while a later prompt investigates the same construct after a program or intervention (Rohs, 2002). The underlying logic here is that time-elapsed designs rely on a shaky assumption that "a person's standard for measurement of the dimension being assessed will not change from pretest to posttest" (Rohs, 2002, p. 51).

However, leadership programs and trainings often involve a shift in the way participants understand constructs foundational to leadership, and are therefore highly susceptible to this problem (Dugan, 2015). For instance, an incoming college student might rate herself as having been a strong leader in high school because she was president of her class council and could accomplish her goals by strong-arming peers on

the council. However, by the time she is a senior in college she may no longer view herself in the same light and give herself a lower rating on the same measure. A conventional pre- and post-test would indicate simply that she had diminished in leadership capacity over her time in college, whereas the difference in scores is actually reflective of a change in her underlying belief of what leadership is. This is the essence of response shift. Therefore, a cross-sectional design, employing retrospective accounts, is more likely to evoke self-reports "from the same perspective" and thus free of this particular bias (Rohs, 2002, p. 52).

Dataset

This study used survey data collected from more than 77,000 students in 2015 as part of the Multi-Institutional Study of Leadership (MSL). Aiming to better understand the state of college student leadership and "enhance institutional practice by better aligning the theory-research-practice cycle," (MSL, 2016a, para.1) a group of faculty, administrators, and graduate students at the University of Maryland-College Park came together in 2005 to design the MSL (Komives, Dugan, et al., 2006). The MSL also was to serve as a national dataset from which researchers could extract comparative data on student leadership (Dugan, 2015). As mentioned previously, the MSL is a cross-sectional survey grounded in the social change model of leadership development as a theoretical framework, and examines a range of input, environment, and outcome variables (Komives, Dugan, et al., 2006). In total, the MSL is composed of more than 400 variables, scales, and composite measures (MSL, 2016b). The specific variables selected for this study are described later in greater detail.

Using purposeful sampling, a diverse group of 52 colleges and universities participated in the initial survey in 2006; investigators captured usable data from over 50,000 student participants (Dugan & Komives, 2007). The MSL is now administered every three years, although that was not always the case. Across six cycles of the survey—2006, 2009, 2010, 2011, 2012, 2015—more than 300 institutions and over 350,000 students have participated. Most respondents are undergraduates in the United States, although some are in Canada, Mexico, Australia, and the Caribbean (Dugan, 2015; MSL, 2016a).

The 2015 MSL was selected for use in this study for two main reasons. First, it is the only sizable dataset that captures students' beliefs about leadership in an open-response format. Second, the 2015 MSL is optimally constructed to support an appropriately powered investigation that allows relationships between work and leadership capacity to vary by specific workplace. All other surveys that examine students' paid employment disaggregate outcomes by location only to the extent that students work on-campus or off-campus.

Instrument

This study analyzed responses to the Socially Responsible Leadership Scale (SRLS) and other scales from the MSL. The current version of the MSL collects demographic data, experiences before college, experiences during college, and a variety of student outcomes (MSL, 2016b). When requesting permission to access the dataset, outside researchers must submit a list of specific variables they wish to use. Thirty-eight variables—some are single items, while others are composite measures—were included in the present study: 16 input variables (demographics and retrospective questions), 19

environmental variables (institution-level variables and college experiences), and 3 outcome variables (leadership capacity, leadership self-efficacy, and definition of leadership). Many of these are discussed in greater detail below.

Socially responsible leadership scale. The SRLS was designed to operationalize the social change model, and has been the primary outcome measure of the MSL since the study first launched in 2006. (For more on the social change model, see Table 2.3 and Figure 2.1 in chapter two). Prior to the development of the SRLS, existing measurements of leadership were leader-centric and often targeted to the business community; none was "appropriate for the voluntary, informal, and/or collaborative nature of many of the leadership processes in which college students participate" (Tyree, 1998, p. 7). After undergoing an extensive process of pilot testing, expert review, confirmatory factor analysis, and test-retest reliability, Tyree (1998) finalized a 104-item measure. It has since undergone several revisions; the version used in the 2015 MSL survey contained 34 items. Sample items from the current SRLS are shown in Table 3.1.

Table 3.1. Sample Items from the Socially Responsible Leadership Scale (MSL, 2015)

Prompt	Scale
I am open to others' ideas.	Controversy with Civility
It is important to me to act on my beliefs.	Congruence
I work with others to make my communities better places.	Citizenship

Note. Respondents are asked to indicate their level of agreement with these statements using a five-point Likert scale (1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly Agree).

Psychometric properties of the SRLS. Dugan (2015), the principal investigator of the MSL, described the rigorous psychometric testing of the SRLS that has taken place over several years, including evaluation for content, structural, and criterion validity, and changes made to account for possible biases that can arise in self-report measures (e.g., social desirability, halo effect). As an example of one update, the current version no

longer attempts to measure the common purpose value, because responses were found to be highly correlated with the collaboration value. A closer examination revealed common purpose to be a function of collaboration as opposed to a distinct value of its own, and therefore was removed. Additional modifications include the removal of the change scale and of negative-response items (Dugan, 2015).

Internal reliability for the SRLS has been estimated on several occasions. For the original instrument (Tyree, 1998), scale reliability ranged from a high of .92 on the 14-item Citizenship sub-scale to a low of .71 on the 14-item Controversy with Civility sub-scale (Dugan, Komives et al., 2008). In the 2006 MSL, reliability ranged from a high of .83 on the 13-item Commitment sub-scale to a low of .76 on the Controversy with Civility sub-scale (Dugan, Komives et al., 2008). With the 2012 MSL, reliability was estimated at the domain level: .91 for individual, .90 for group, .91 for societal, and .82 for change. Additionally, the Cronbach's alpha was calculated at .74 for the eight-item SRLS pretest (Dugan et al., 2011). Reliability estimates have not been published for the 34-item SRLS in use for the 2015 MSL, however they were recalculated in the current study, and are discussed in the section on validity and reliability below.

Leadership self-efficacy. In addition to the SRLS, a four-item scale on self-efficacy for leadership was used as an additional dependent variable. This construct is important, as discussed in chapter two, because the extent to which someone feels confident in his or her leadership abilities has been shown to predict whether he or she assumes an authoritative leadership role (Dugan, Garland et al., 2008). Neither validity nor reliability estimates have been published for the scale, however they were also

checked in the current study and results are reported in the section on validity and reliability below.

Sample

Data from 87 American colleges and universities are included in the MSL 2015 national benchmark; the national benchmark is the term used by MSL staff to refer to the dataset made available to outside researchers. (MSL staff withheld data from nine additional institutions, including community colleges, schools outside the United States, and schools that did not provide random samples. In each case, either the college opted to be excluded from the national benchmark or was excluded by MSL staff in order not to skew the national sample.) The total sample size was 311,678 students, and 96,620 students completed at least a portion of the survey, for a response rate of 31 percent. After removal of partial-completes and withheld data, the dataset shared by MSL staff included 77,489 complete cases.

Sample size reductions. All results reported in research questions one and two relied on a reduced sample size (n=35,829). This number resulted from limiting the original sample (n=77,489) in several ways. First, the sample was reduced to only those participants who completed 90 percent of survey items deemed core to the MSL by its project staff, resulting in the removal of 110 cases. Second, the process of propensity score matching, described in greater depth below, required a painstaking process of attempting to match working and non-working students across a range of covariates. In doing so, two covariates—residential status and participant age—proved particularly difficult to match, and the decision was made to neutralize their impact on the propensity score by eliminating non-residential (n=30,988) and non-traditional-aged students (i.e.,

over age 24, n=10,562). These reductions resulted in the final sample size listed above. The final sample size for research question three was 67,160, reflecting the number of participants who provided an answer to an open-ended question: "Please provide a brief definition of what the term *leadership* means to you" (MSL, 2015). See Table 3.2 for descriptive statistics.

Data collection. Data were collected between January and April 2015 in a web-based survey conducted by a private survey research firm. Using purposive sampling methods, participating institutions drew a random sample of 4,000 students if their enrollments exceeded that number. Institutions with fewer than 4,000 students conducted a census if possible. Institutions were encouraged to oversample if possible in order to attain 4,000 responses. These specifications were determined after MSL staff conducted a power analysis with desired confidence intervals of 95 percent and a margin of error of plus or minus 3 points. It is important to note that despite the sizable sample, the MSL makes no claim that its participating institutions or subsequent findings are representative of some broader population of college students.

Variables

The variables that were used in this study follow from Astin's (1993b) I-E-O model, and can be found in Table 3.3. Omitted variables include scales related to social perspective taking, resiliency, cognitive skills, hope, motivation to lead, and collective racial esteem, as well as certain demographic and environmental variables. In each case, the choice to exclude a variable was made because the construct was unrelated to prior research about working students, or about students' conceptualizations of leadership, or was not released for analysis by outside researchers.

Table 3.2. Descriptive Statistics for Total Sample

Variable	Original sample (n=77,489)		Reduced sample (n=35,829)	
	Count	Percent	Count	Percent
Sex				
Female	49,775	64.2	23,206	64.8
Male	27,308	35.2	12,456	34.8
Trans	356	0.5	160	0.4
Race				
White/Caucasian	52,239	67.4	25,047	69.9
African-American/Black	4,105	5.3	1,820	5.1
Latino/Hispanic	4,854	6.3	1,601	4.5
Asian American	5,405	7.0	2,624	7.3
Multiracial	7,751	10.0	3,607	10.1
All other races	1,015	1.3	1,110	3.1
Class Year				
First Year	17,456	22.5	14,739	41.1
Sophomore	16,174	20.9	9,940	27.7
Junior	19,130	24.7	6,381	17.8
Senior	23,028	29.7	4,667	13.0
Parents' Annual Income				
Under $25,000	7,454	9.6	2,032	5.7
Between $25,000-$55,000	11,246	14.5	4,235	11.8
Between $55,000-$100,000	17,026	22.0	7,669	21.4
Above $100,000	25,128	32.4	13,349	37.3
Don't Know or Prefer Not to Say	16,544	21.4	8,544	23.8
Generation Status				
First Generation	11,463	14.8	3,863	10.8
Non-First Generation	65,204	84.1	31,659	88.4
Self-identified Disability				
Disabled	8,378	10.8	3,691	10.3
Not disabled	69,111	89.2	32,138	89.7
Sexual Orientation				
Heterosexual	70,694	91.2	32,762	91.4
LGBTQ or Questioning	6,641	8.6	3,033	8.5
Citizenship status				
Domestic student	74,620	96.3	34,522	96.4
International student	2,869	3.7	1,307	3.6
Military affiliation, past or current				
No	75,662	97.6	35,849	99.1
Yes	1,827	2.4	340	0.9
Enrollment				
Full-time	73,311	94.6	35,660	99.5
Part-time	4,178	5.4	169	0.5

Note. Count and percent data may not total to full sample sizes or to 100 percent because missing data were excluded. Class Year variable excludes graduate students and unclassified students.

Table 3.3. Variables

Input	Environment	Outcome
Demographics	Institutional Characteristics	Leadership capacity
Full-time/Part-time status	Size	Leadership self-efficacy
Class year	Public/Private control	Definition of leadership
Gender	Carnegie classification	
Race	Selectivity	
First generation status	Religious affiliation	
Disability status	Location of campus	
Sexual orientation	College Experiences	
Citizenship status	Working on- and off-campus	
Military affiliation	Number of hours worked per week	
Parents' income	Primary on-campus work location	
Living arrangements	Community service participation	
Retrospective Scales	High impact practices	
Leadership self-efficacy	Social change behaviors scale	
Leadership capacity	Student organization involvement	
High school activities	Leadership experiences	
Precollege activities	Mentorship experiences	
Social change behaviors	Leadership training or programs	
	Resident Assistant experience	
	Socio-cultural conversations scale	
	Estimated college GPA	

Input variables. Inputs included demographic variables and retrospective reports of high school leadership beliefs and behaviors. As described in chapter two, prior research has shown that self-reported leadership capacity or leadership self-efficacy varies significantly by gender and race (Dugan, Komives et al., 2008; Dugan et al., 2012; Dugan & Komives, 2010; Haber, 2012). Additional studies have shown these outcomes also vary by living arrangements (Dugan, Garland et al., 2008) and first generation status (Durham Hynes, 2010), among other natural groupings of students. Some variables (e.g., parents' income, military affiliation, citizenship status) have not been shown previously to relate with leadership capacity, however were included in this study because of their relevance to economic factors that might influence students to take on paid work while enrolled.

Several retrospective self-report items have been included in this study as additional control variables. In contrast to a true pre-test, which would occur prior to college enrollment, these questions are more accurately labeled as retrospective scales because participants look back and assess themselves as high school students as part of the same cross-sectional survey where "post-test" items appear. The importance of retrospective scales cannot be understated, however, as scores may in some cases explain a significant amount of variance in leadership outcomes (Dugan et al., 2013; Komives & Johnson, 2009). The specific retrospective measures that were employed in this study capture participants' *current* assessment of their high school-era leadership capacity, self-efficacy for leadership, extracurricular activities, and engagement with social change activities or leadership training.

Environmental variables. The primary variables of interest in this study—whether students work on- or off-campus, the average number of hours they work per week, and, for on-campus work, their primary workplace—are considered environmental because they are endemic to the college student experience. As described extensively in chapter two, variables that measure whether students have obtained paid employment while enrolled, whether they work on- or off-campus, and the number of work hours in a typical week, are the standard means by which researchers have operationalized the student employment construct (Nuñez & Sansone, 2016; Perna et al., 2006; Riggert et al., 2006). This study adds to the existing literature by attempting to categorize the most frequent on-campus work locations (e.g., residential life, library, public safety) and employ these categories as covariates to more accurately explain and predict self-reported leadership capacity or self-efficacy.

Beyond work-related variables, the MSL measures a variety of college experiences through numerous scales, including self-reported involvement in student-led organizations, participation in leadership programs or training, and sociocultural conversations (i.e., conversations among students interacting across and about demographic differences). A substantive array of studies has demonstrated significant relationships between distinct curricular or co-curricular experiences and leadership outcomes as assessed by the MSL (e.g., Rosch & Caza, 2012; Dugan, 2008a, Dugan & Komives, 2010; Gasiorski, 2009), and thus provided a rationale for their inclusion in this study as additional control variables.

Institutional characteristics provide another type of environmental variable, and include the size of an institution (i.e., number of enrolled students), whether it is controlled publicly or privately, and its Carnegie classification (e.g., baccalaureate, master's, doctoral), among other variables. Researchers with the MSL added these institutional variables based on public information such as IPEDS, rather than soliciting them from students. Although prior research (e.g., Dugan et al., 2013) has found minimal variance in leadership outcomes between institutions, one study (Owen, 2008) employed hierarchical linear modeling as a tool to examine institution-level variance in MSL 2006 data and found significant interaction effects between institution size and perceived self-efficacy for leadership. Given this prior finding, it seems prudent to account for institutional characteristics in this study, as no published paper to date has considered its relationships with leadership capacity or self-efficacy in MSL 2015 data.

Outcome variables. Outcome variables assess leadership capacity and self-efficacy, as well as respondents' conceptualization of leadership. Leadership capacity is

measured using participants' mean score across all 34 SRLS items, while leadership self-efficacy is measured using the mean score across a four-item scale. The final outcome variable captures responses to an open-ended query that asks students to define the word *leadership* in their own words. This question was first analyzed by Haber (2011, 2012), as described in chapter two, and is of particular interest in light of research that suggests pre-existing beliefs about leadership can affect related outcomes (Caza & Rosch, 2014). In this study, students' conceptualizations of leadership were extracted from this question and analyzed using tools developed by researchers who conduct text mining analysis.

Descriptive and Predictive Analysis

Descriptive and predictive analytical tools were used to address research questions one and two. Although most prior studies using MSL data have not shown work status to be a significant predictor of leadership capacity (see, for example, Dugan & Komives, 2010), the most recent investigation (Salisbury et al., 2012) uncovered a significant association with work status among a sample drawn from the Wabash National Study. In light of conflicting findings, possible relationships among these variables were explored anew using data captured with the revised SRLS. Research question one was designed to capture all descriptive analyses of this particular national sample, while research question two was designed to assess whether the findings of Salisbury et al. (2012) could be validated in a larger sample, and, if so, whether they extend to a broader population beyond their first year in college. Hierarchical linear modeling was used to examine possible relationships among work status, work location, hours worked, and leadership capacity or self-efficacy for leadership. Propensity score analysis was attempted to reduce self-selection bias among students who are employed,

and therefore make all participants more comparable on the treatment condition (working). Cronbach's alpha was used to estimate scale reliability, and principal components analysis was conducted to provide evidence of the structural validity that underlies each SRLS domain. Each of these steps will be discussed subsequently in greater detail.

Maintaining confidentiality

MSL staff prepared and cleaned the original SPSS file with requested variables and shared the file via a Dropbox folder. According to the MSL principal investigator, the open-ended variables that were requested for this study could contain institutionally-identifiable information. To maintain confidentiality, it was agreed that any identifiable information would be uncovered during the text mining portion of the study and isolated from analysis. Any identifiable information that was not filtered by this process would be removed manually from the data file. For added security, the file was downloaded and moved to a secure server maintained by the Lynch School of Education and owned by Dr. Heather Rowan-Kenyon, chair of this dissertation. All study files were maintained in this folder, to which only the PI and Dr. Rowan-Kenyon have access. This study was reviewed and granted exempt status by the Institutional Review Board at Boston College on September 27, 2016.

Preparing the Data

Once accessed in SPSS, the data file was prepared for subsequent analysis. First, work location (a category constructed and tested during text classification, as described below in the discussion of text mining analysis) was imported from WordStat and checked for accuracy. (WordStat is a software application that enables content analysis.)

Second, the file was examined for missing data and appropriate decisions were made regarding listwise deletion or multiple imputation (Enders, 2010; Tabachnick & Fidell, 2007). Third, assumptions of regression were checked. Fourth, dummy variables were constructed to represent distinctive workplace environments (e.g., residential life, administrative, library, food service), as well as other categorical variables included in regression models (e.g., class year, race/ethnicity). Fifth, reliability of all scales was estimated by recalculating Cronbach's alpha, and evidence of the structural validity of the latent constructs embedded within the outcome variables was established through principal components analysis, as described in greater detail later. Finally, propensity score methods were used to approximate the likelihood that a study participant would belong to the "treatment" condition (i.e., working). This process, also described in greater detail later, aimed to ensure a less-biased estimate of the association between work and leadership capacity or self-efficacy.

Missing value analysis. Missing data can hamper or distort statistical tests, particularly in cases where missing values are related to specific characteristics within a sample (Enders, 2010; Tabachnick & Fidell, 2007). A missing value analysis was performed on the full MSL data set (n=77,489) prior to sample reduction or variable transformations. According to guidelines by Tabachnick and Fidell (2007), missing data in the MSL can be assumed to be at least missing at random (MAR), as there were no variables included in this study with 5 percent or more missing values. Although Little's MCAR test was significant (Chi-square: 29918.005; df=22396; $p<.001$), missingness was found to be unrelated to the dependent variables (Tabachnick & Fidell, 2007). The decision was made to delete missing cases listwise, as the only variable with any

substantive number of missing values was class level (i.e., freshman, sophomore), with 2.2 percent missing; as a grouping variable, it was not an ideal candidate for multiple imputation.

Normality, outliers, and variable transformations. After an examination of a variety of descriptive statistics and a visual inspection of histograms and Q-Q plots, it appeared that one of the dependent variables was not normally distributed. The leadership capacity variable (OMNIBUS) was negatively skewed and platykurtic, with a host of outliers at the low end of the scale. A subsequent comparison of the mean (4.17) and 5 percent trimmed mean (4.19) suggested that outliers could be safely ignored, however to improve both skewness and kurtosis the variable was square transformed. The retrospective scale variable for leadership capacity (PRESRLS) also appeared negatively skewed and was square transformed, with a similar result. Furthermore, both dependent variables (OMNIBUS and OUTEFF) were standardized to improve the interpretability of coefficients in regression analysis.

Two variables in the original data set that captured number of hours worked per week off-campus (ENV1A) and on-campus (ENV2A) were strongly positively skewed, with most respondents reporting zero hours. With no reason to doubt respondents' accuracy in reporting weekly hours worked, these non-normal sampling distributions were not transformed, however they were combined into one continuous variable (TOTAL_HRS) for further analysis.

Most other variables were categorical, and the majority of those were transformed into dichotomous dummy variables. See Table 3.4 for the full list of dummy variables and codes. The independent variables of primary interest—those related to work status—

Table 3.4. Dummy variable coding

	No	Yes
Level 1 variables		
Work status (Reference group: Not working)		
Off-campus only	0	1
Off-campus only	0	1
Both on- and off-campus only	0	1
Workplace locations (Reference group: Not working at this location)		
Academics	0	1
Academic Support	0	1
Admissions and Financial Aid	0	1
Administration	0	1
Alumni Relations and Development	0	1
Athletics, Recreation, and Wellness programs	0	1
Auxiliary Services	0	1
Food Service	0	1
IT and Technology Services	0	1
Library	0	1
Public Safety	0	1
Residential Life	0	1
Spiritual Life	0	1
Student Affairs	0	1
Race (Reference group: White/Caucasian)		
African-American/Black	0	1
Latinx	0	1
Asian American/Asian	0	1
Multiracial	0	1
Race-other (includes Middle Eastern/North African, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and Race not listed)	0	1
LGBQ (Reference group: Heterosexual)	0	1
International student (Reference group: Domestic)	0	1
Enrollment status: Part-Time (Reference group full time)	0	1
Disability (Reference group: Not disabled)	0	1
Military affiliation, past or current (Reference group: no affiliation)	0	1
Parents' income (Reference group: Less than $25,000 per year)		
Annual income between $25,000 - $55,000	0	1
Annual income between $55,000 - $100,000	0	1
Annual income over $100,000	0	1
Annual income not reported (includes don't know and decline to answer)	0	1
First Generation status (Reference group: Not first generation)	0	1
Class Year (Reference group: Seniors; grad students and unclassified as missing)		
First-Year students	0	1
Sophomores	0	1
Juniors	0	1
Level 2 variables		
Carnegie classification (Reference group: Baccalaureate)		
All Research (includes Doctoral/Research, High Research, and Very High Research)	0	1

Table 3.4 continued. Dummy variable coding

	No	Yes
Masters	0	1
Institutional size (Reference group: Enrollment above 20,000)		
Size below 5,000	0	1
Size between 5,000 and 10,000	0	1
Size between 10,000 and 20,000	0	1
Institutional control: Private (Reference group: Public)	0	1
Institutional selectivity (Reference group: Less selective)		
Unclassified	0	1
Competitive	0	1
Very, Highly, and Most Competitive	0	1
Institutional setting (Reference group: City)		
Suburb	0	1
Town	0	1
Institutional Affiliation: Religious (Reference group: Secular)	0	1

were transformed into three distinctive dummy variables to capture the unique portion of the sample that worked off-campus, the portion that worked on-campus, and the portion that worked in both locations. Sixteen environmental variables (ENV10a1 through ENV10a16), representing categorical student engagement with specific leadership experiences, were dichotomized because 80 percent or more respondents answered "never" on a Likert scale in response to most items. Moreover, these variables represented environmental controls peripheral to the research questions.

Checking assumptions of regression. Regression analysis relies on four main assumptions: linearity, normality, homoscedasticity, and independence of observations and associated residuals (Tabachnick & Fidell, 2007). When data are nested, as in this study, the latter two assumptions cannot easily be met. Hierarchical linear modeling was employed to account for possible heteroscedasticity and correlated errors (Bickel, 2007; Raudenbush & Bryk, 2002). Prior to building regression models in HLM, the data were also examined for multicollinearity, a problem in which variables are too strongly

correlated (Tabachnick & Fidell, 2007). Two separate OLS regression models were run in SPSS for each of the dependent variables, with all independent variables entered simultaneously. Tolerance statistics were below 0.1 and the variance inflation factor (VIF) estimates were above 10 for all variables, except working on-campus and the 14 on-campus workplace categories, which together presented a problem of singularity. To avoid this problem without sacrificing the research question, working on-campus was never included in a model at the same time as the specific workplace categories.

Validity and reliability estimation. The MSL staff rely on an assumption that the variables being measured accurately reflect latent constructs (e.g., consciousness of self, collaboration, citizenship) in the social change model, and that these constructs are related to one another. It is important to confirm the accuracy of those assumptions. The two scale-based outcome variables assessed in this study—leadership capacity and self-efficacy for leadership—are composed of eight latent constructs. The socially responsible leadership scale (SRLS) consists of six sub-scales and an overall measure of leadership capacity, while a four-item scale attempts to assess self-efficacy for leadership. Content validity for the SRLS was established during its development (Tyree, 1998) and both structural and criterion validity were established more recently with confirmatory factor analysis through structural equation modeling (Dugan, 2015; Tabachnick & Fidell, 2007). By contrast, the self-efficacy for leadership scale has not undergone similar psychometric testing. Principal components analysis (direct oblimin rotation, factor loading=0.3) was used in the present study to validate the measurement model and provide additional evidence that the scales are structurally valid (Tabachnick & Fidell, 2007). All KMO values were above 0.8, and Bartlett's test of sphericity was significant for each ($p<.001$).

All scales except leadership capacity returned just one factor with an eigenvalue of at least 1.0. Leadership capacity (OMNIBUS) returned five factors above the minimum eigenvalue threshold, however the initial factor explained the vast majority (42 percent) of variance; the remaining factors each explained between three and six percent of additional variance. Cronbach's alpha coefficient is a common indicator of internal consistency within scales, and was recalculated in the present study; all alpha coefficients ranged from 0.77 to 0.96. Full results of principal components analysis and Cronbach's alpha scores are reported in Table 3.5.

Table 3.5. Results of validity and reliability checks.

Scale	# items	KMO value	Bartlett's test of sphericity	# factors	Variance explained	Cronbach alpha
Pre-test for leadership efficacy	4	.816	<.001	1	73%	.87
Pre-test for leadership capacity	7	.843	<.001	1	42%	.77
Social change behaviors	10	.930	<.001	1	55%	.91
Socio-cultural conversations	6	.891	<.001	1	68%	.91
SRLS subscales						
Consciousness of Self	6	.850	<.001	1	54%	.83
Congruence	5	.854	<.001	1	64%	.86
Commitment	6	.876	<.001	1	60%	.86
Collaboration	6	.869	<.001	1	57%	.85
Controversy with Civility	5	.833	<.001	1	59%	.82
Citizenship	6	.907	<.001	1	66%	.90
Leadership capacity	34	.969	<.001	5	42%^	.96
Leadership self-efficacy	4	.819	<.001	1	72%	.87

^ indicates variance explained by initial factor only

Propensity score analysis. Students who work for pay while enrolled are not likely to be randomly distributed in the broader population of college students. Rather, students choose to work for a variety of reasons, from financial need to career development. It is unreasonable, therefore, to simply compare students who work and those who don't work on some outcome variable, and claim that variance is associated

with this distinct experience. Moreover, researchers cannot ethically or logistically assign students to work or not to work and assess varying outcomes, as would occur in the "gold standard approach" of a randomized control trial (P. Austin, 2011, p. 399). Therefore, an empirically rigorous investigation of observational data gathered from students who work must adopt a quasi-experimental method to control for this bias. Propensity score analysis provides an ideal vehicle to accomplish this goal, as it balances students on the probability of membership in a "treatment" condition (in this case, working), conditional on a range of baseline covariates (P. Austin, 2011, Bowman, Park, & Denson, 2015; Guo & Fraser, 2015). In the present study, propensity score analysis was used to determine the likelihood that survey respondents would belong to the "treatment" condition. Inverse probability treatment weights (IPTW) are then calculated and applied, in the manner of conventional survey weights, to the sample prior to constructing HLM models (P. Austin, 2011).

Variable selection. To begin calculating a propensity score, a logistic regression model was created to predict a binary variable representing the "treatment" condition (1=working; 0=not working) using a range of covariates. Existing literature provides conflicting direction on the selection of covariates, though this choice is perhaps the most important in determining the efficacy of the propensity score (P. Austin, 2011; Bowman et al., 2015; Guo & Fraser, 2015). Following the recommendation of many scholars, only baseline characteristics or pre-treatment variables were included (P. Austin, 2011; Bowman et al., 2015; Bowman, Denson, & Park, 2016; Guo & Fraser, 2015; Hirano & Imbens, 2001; McCaffrey et al., 2004). In practice this meant only demographic variables and retrospective scales available in the MSL were used, while environmental variables

that reported college experiences were left out. (For a full list of covariates included in the propensity score calculation, see Appendix Table A.1.)

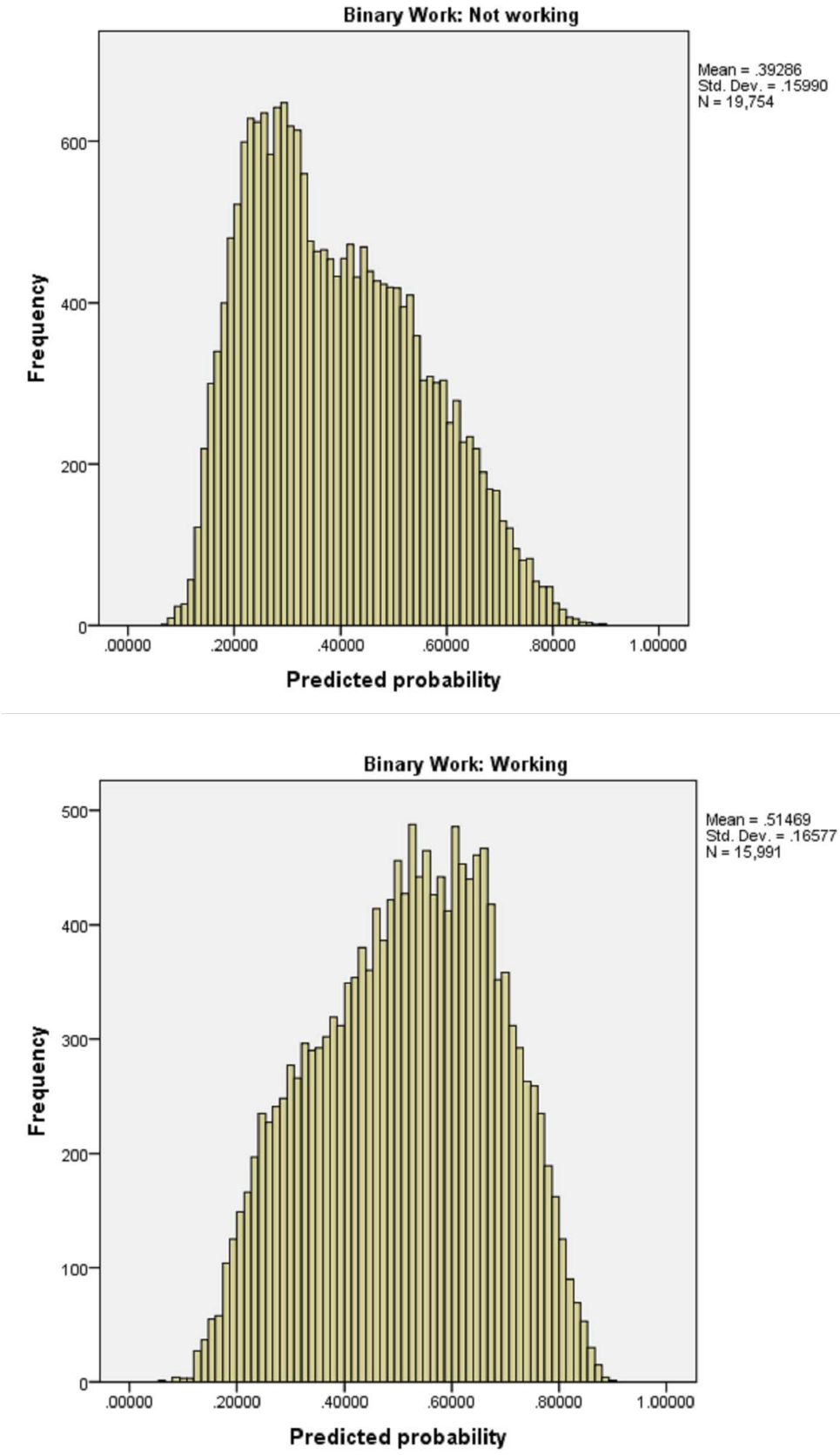
Inverse probability treatment weighting. Once the propensity scores were created, a visual inspection of the distributions of scores (see Figure 3.1) suggested considerable overlap in the propensity to work among students in both working and non-working groups, a necessary condition for proceeding to balance the groups on the derived score.

Among the balancing methods available, inverse probability treatment weighting (IPTW), which uses the propensity score to calculate a weight for use in regression models, was employed (P. Austin, 2011; Guo & Fraser, 2015). This weight can be calculated in one of two ways: to estimate the average treatment effect on the treated (ATT), which refers to the change in leadership capacity and self-efficacy scores among those students who worked while enrolled, or to estimate the average treatment effect (ATE) for all participants, that is, the change in scores associated with working across all students (Guo & Fraser, 2015). The decision to favor ATT was driven by a stronger interest in determining the measurable change for those students who actually worked, rather than the average change in scores among all students who were likely to have been working, irrespective of actual working status (Guo & Fraser, 2015). The following formulas were used to calculate a weight via the ATT method, where Bin_Work is a binary variable capturing student employment status, and Pre_1 is the predicted probability score obtained via logistic regression:

$$If\ Bin\_Work = 0, then\ wgt = \frac{Pre\_1}{1 - Pre\_1}$$

$$If\ Bin\_Work = 1, then\ wgt = \frac{Pre\_1}{Pre\_1}$$

Figure 3.1. Distribution of propensity scores by working status.



Validating the propensity score. To determine whether the propensity score had the desired effect of reducing self-selection bias between working and non-working students, an estimate of standardized bias between treatment and control participants was computed for each covariate before and after weighting. Standardized bias effectively estimates "the size of the difference between treatment groups" across key variables after accounting for a propensity score, while simultaneously rank-ordering those differences to easily display the range of imbalance (McCaffrey et al, 2014, p. 12). As standardized bias is essentially an effect size indicator, meaningful differences follow Cohen's (1992) guidelines of 0.20 (small), 0.40 (medium), and 0.60 (large). The following formula was used to compute standardized bias, where P_1 is the proportion of working students in the unweighted sample on a unique covariate, P_2 is the proportion of working students in the weighted sample on the same covariate, and n_2 is the weighted sample size of working students on that covariate: $\frac{P_1 - P_2}{\sqrt{\frac{P_2(1-P_2)}{n_2}}}$

After weighting, bias was reduced significantly in a majority of covariates. Out of 28 dichotomous or categorical covariates, 61 percent (n=17) evidenced a standardized bias within +/- 0.25 after weighting, while 89 percent (n=25) were within +/-0.60. Three variables with a larger imbalance remained after weighting: parents' income $100,000 and above (standardized bias -0.62); high school sports (standardized bias 1.58); and pre-college leadership training or education (standardized bias 0.82).

One final test of the propensity score, recommended by Guo and Fraser (2015), involved creating a new logistic regression model, predicting the binary treatment condition variable (Bin_Work) using all covariates that were employed to create the propensity score. Before weighting, 26 of 30 covariates were significant predictors

($p<.05$) of treatment status; after weighting, none were significant. Taken together, the standardized bias and logistic regression checks suggest that the propensity score is effectively reducing self-selection bias among students who work.

Statistical Power

Statistical power can be thought of as the ability to see a significant effect where one exists. In other words, a statistical test with sufficient power will permit the rejection of a null hypothesis that is indeed false in the population (Tabachnick & Fidell, 2007). In the context of this study, sufficient power is needed to uncover the impact of work on leadership capacity. Statistical power is a function of effect size, significance level (α), and the sample size (Tabachnick & Fidell, 2007). Given that this study has a large sample size, even modest effects appeared statistically significant. Beyond the significance level, however, greater attention will be paid to standardized effect sizes, which contribute to decisions about the practical significance of any findings (Tabachnick & Fidell, 2007).

Multilevel Regression Analysis

Significant relationships among the variables were explored by constructing four hierarchical linear models (HLM). HLM models are ideal when working with nested data. Nested data violates assumptions of ordinary least squares (OLS) regression, specifically independence of observations and errors, and homoscedasticity (Bickel, 2007; Raudenbush & Bryk, 2002). HLM accounts for this nesting by partitioning variance among participants (i.e., within institutions, at level-1) and among institutions (at level-2) and adjusting standard errors accordingly.

Several prior MSL studies have attempted to account for this nesting by utilizing a multilevel approach. In each case the intraclass correlation was small, indicating a

practically insignificant amount of variance in the outcome among institutions (Dugan et al., 2012, 2013; Owen, 2008). For example, Dugan et al. (2013) found just 2.5 percent of the total variation in leadership self-efficacy scores among women in STEM majors was attributable to between-school differences. Furthermore, Astin and Denson (2009) compared multilevel modeling and OLS regression approaches and found that with respect to multi-campus studies of college impact, each method provided an equally good fit with the data. Therefore one alternative when working with MSL data would be to conduct OLS regression with robust standard errors. Nevertheless, a multilevel approach is preferred, even if little or no aggregate variability in the dependent variables is present between institutions, as specific institutional characteristics (e.g., institution size, control) may in fact moderate the relationship between individual characteristics and self-reported leadership capacity or self-efficacy (Bowman et al., 2015; Thomas & Heck, 2001). In other words, it is possible that the relationship between work variables and leadership capacity might be stronger, for example, among students at small, private institutions, rather than large, public institutions.

Model specification. Four intercepts and slopes-as-outcomes models were developed to test associations between work variables and each of the dependent variables: leadership capacity and self-efficacy for leadership. Intercepts and slopes-as-outcomes models attempt to predict significant variability in randomly varying level-1 intercepts and slopes, and are appropriate to address these research questions given the potential relevance of institutional variables. The initial two models examined possible relationships among the dependent variables and dummy variables representing the three permutations of work status: working on-campus, working off-campus, and working both

on- and off-campus; the referent group included participants not working while enrolled. The latter two models substituted the working on-campus dummy variable with 14 dummy variables representing specific on-campus workplace locations. Additionally, the latter models included a continuous variable representing total hours worked on- and off-campus per week. Prior to developing multilevel models, the dependent variables were standardized (mean=0, s.d.=1) to improve interpretability of results. Descriptive statistics for all 94 covariates are shown in Appendix Table A.2.

Weights and centering. Sampling weights are not used by MSL researchers, however the propensity score weight discussed previously was applied at level-1 only, as it was designed to balance participants on the covariate of interest: working. All covariates included in modeling were grand mean centered, in which the mean on each covariate across all level-2 units is subtracted from each participant's value on the same covariate. Grand mean centering is effective at producing more meaningful intercepts and simultaneously adjusts for differences in proportions among categorical variables (Bickel, 2007; Raudenbush & Bryk, 2002).

Model building process. Each of the four models was developed according to the following procedure. First, an unconditional model was run in order to estimate the intraclass correlation coefficient (ICC). The ICC indicates the proportion of variance in each outcome variable that is attributable to differences among institutions, as opposed to among participants (Raudenbush & Bryk, 2002). The ICC for each model is shown toward the bottom of each table that displays random effects. Second, work-related covariates were entered by themselves to examine their unadjusted associations with each dependent variable. Third, the remaining student-level covariates were entered in blocks:

demographics, retrospective scales, and environmental variables. Variables that were not significant at $p<.05$ were removed after each block, with two exceptions. Work variables, central to these research questions, were retained irrespective of their significance. Similarly, non-significant dummy variables were retained in order that significant dummies would remain interpretable.

Next, the slopes for each significant covariate were allowed to vary, one at a time, across institutions at level-2. Following recommendations by Raudenbush and Bryk (2002), three criteria were adopted to determine which slopes should be fixed and which should remain randomly varying. For a slope to vary randomly in the final level-1 model, it must have been reliably predicted (above 0.05), and both its fixed and random components must have retained significance ($p<.05$). Any slope that did not meet one or more of these criteria was fixed. The final student-level model therefore included all relevant work variables; statistically significant demographic, retrospective, and environmental variables, along with non-significant dummy variables; and randomly varying slopes that passed a three-part test.

The final step involved introducing institutional characteristics at level-2 to attempt to explain variance in level-1 slopes of work variables. The level-1 intercept was not significant in any final level-1 model, therefore no attempt was made to explain its random variance. Similarly, no attempt was made to explain variance in non-work-related slopes (e.g., demographics), as those analyses were outside the scope of the current research question. In order to maintain stability in the model, level-2 covariates were introduced and removed simultaneously from all randomly varying slopes. Thus, the final

institution-level model retains non-significant variables (and dummy variables) if they demonstrated statistical significance in at least one slope.

Interpretation of coefficients. In each of the tables of parameter estimates shown in chapter four, there are multiple fixed and random components. The level-1 intercept (γ_{00}) is the mean score on each of the dependent variables across all colleges, when all other covariates are at their grand mean—zero, in most cases. The fixed effect for each covariate (e.g., γ_{10}, γ_{20}) reflects the average regression slope for each grand mean centered variable. Cross-level terms (e.g., γ_{11}, γ_{12}) indicate the increment to the regression slope that results from an interaction between level-1 and level-2 covariates. Deviance statistics at the bottom of the fixed effects tables represent -2 times the maximum log likelihood function, and are used to assess model fit. Generally speaking, the lower deviance scores suggest a better model, although in certain instances (as in Model D) a chi-square test is useful in comparing two deviance statistics against a critical value (degrees of freedom reflect the difference in number of parameters) to determine which model is preferred. Random components include the residual variance in the intercept (u_{0j}) and slopes (e.g., u_{1j}, u_{2j}) and the level-1 error (r_{ij}). In the random effects tables shown in chapter four, the variance of u_{0j} (τ_{00}) is shown on the first row, followed by the variance of randomly varying slopes (e.g., τ_{11}, τ_{21}), followed immediately by the variance of r_{ij} (σ^2).

Text Mining Analysis

Text mining is a form of data mining employed specifically with data stored in text format. With roots in library science, text mining can “turn text into numbers” (Miner et al., 2012, p. 30), thus facilitating the efficient processing of large amounts of

text data where traditional qualitative methods are impractical or inefficient (Zilvinskis, 2015). In an educational context, text mining can be used to investigate a range of qualitative data provided by students, including application essays, blog posts, course evaluations, survey responses, and e-portfolio submissions (Zilvinskis, 2015). Within the context of this study, this innovative method allowed for systematic analysis of a much larger sample size, an inductive development of thematic categories, and comparison of findings across select variables (e.g., working status).

Building explicitly from Haber's (2011) work that investigated conceptualizations of leadership among 1,100 MSL respondents, this study used standard procedures for text mining analysis as described by Miner et al. (2012) and Ignatow and Mihalcea (2017) to analyze all 67,790 responses to the open-ended prompt for a definition of leadership, in order to address research question three. Text mining was also employed to identify and group assorted on-campus workplace locations into categories for use in addressing research question two. Text mining procedures include preprocessing, calculated word frequencies, dictionary categorization, clustering analysis, co-occurrences, principal components analysis, and document classification, and will be discussed in greater detail below. WordStat, a content analysis application embedded within the qualitative data management software program QDAMiner, was used to perform these analyses.

The specific methodology for mining unstructured text data is described by Miner et al. (2012), who recommend employing a modified version of the Cross-Industry Standard Process for Data Mining, or CRISP-DM. The CRISP-DM protocol, the most popular among a small group of related methodologies, provides "comprehensive coverage" of all activities related to data mining, and is therefore an appropriate

framework to use in this study (Miner et al., 2012, p. 74). The six phases of the CRISP-DM are shown in Table 3.6.

Table 3.6. Six phases of Miner et al.'s (2012) Cross-Industry Standard Process for Data Mining (CRISP-DM) as applied to text mining projects.

Phase	Title	Questions that underlie this process
1	Determine the purpose of the study	What is the problem this study aims to address?
2	Explore the availability and nature of the data	What data are relevant and obtainable? In what format are these data? What are the quality of these data?
3	Prepare the data	What modifications are necessary to ensure the data are ready for analysis?
4	Develop and assess the models	What knowledge can be obtained from these data? What patterns, relationships, and themes exist among the variables? Can these data successfully predict an outcome variable?
5	Evaluate the findings	Were all activities that occurred prior to data analysis (e.g., sampling and data collection) performed properly? Do the findings make sense in light of the extant literature? How can the findings be validated?
6	Deploy the results	How can the findings of this study be shared and put to use? What further investigation will be required?

The first two phases—determine the purpose of the study, and explore the availability and nature of the data—have been discussed above and in chapter two. The final two phases--evaluate the findings and deploy the results—will be discussed briefly below, and in greater detail in chapters four and five. The specific text mining processes are reflected in phases three and four of the CRISP-DM—prepare the data, and develop and assess the models—and will be discussed in detail here. It is helpful to think of the actual process of text mining as three sequential sets of activities: first, establish the corpus;

second, preprocess the data; and third, extract the knowledge from the data (Miner et al., 2012). These activities, and their component tasks, are summarized in Table 3.7.

Table 3.7. Primary text-mining activities within Miner et al.'s (2012) CRISP-DM methodology

Activity	Title	Tasks
1	Establish the corpus	Gather documents and digitize for computer processing
		Ensure quality of data throughout
2	Preprocess the data	Tokenize to identify words among all characters
		Stop-word removal
		Extract named entities and unknown words
		Create an include-word list or dictionary
		Stem or lemmatize
		Normalize spelling and case
		Create a term-document matrix
		Normalize raw term frequencies
		Reduce matrix dimensionality
3	Extract the data	Thematic analysis
		Feature extraction
		Keyword in context
		Sentiment analysis
		Cluster analysis
		Association/Link analysis
		Word and document classification

Text Mining Activity 1: Establish the Corpus

The term *corpus* refers to a collection of documents. To establish a corpus, a researcher must collect and organize all documents that are obtainable and relevant to the problem being investigated. According to Miner et al. (2012), "the quality and quantity of the data are the most important elements" of this task (p. 79). Documents may be readily available or require automated techniques such as web crawling to obtain. Once documents are obtained, they must be digitized in the same format (e.g., Word document, ASCII text file) before computer processing can begin.

In this study, the corpus is composed of free-written text responses to two questions on the 2015 MSL. The first question (labeled "ENV2B" in the codebook,

n=22,138) asked participants who reported working a job on-campus: “in what department or office do you currently work ON CAMPUS? (If you work in more than one, please indicate the department or office for which you complete the majority of hours)” (MSL, 2015, p. 4). The second question (labeled “DEF” in the codebook, n=67,160) asked all participants to “please provide a brief definition of what the term *leadership* means to you” (MSL, 2015, p. 28, italics in original). Responses to these questions were included in an SPSS file made available by the MSL project manager, who prepared the data file with requested variables specifically for this study. To illustrate the preprocessing and knowledge extraction tasks, three sample responses to the definition question have been highlighted in Table 3.8.

Table 3.8. Sample responses to MSL 2015 question asking for a definition of leadership.

Example	“Please provide a brief definition of what the term *leadership* means to you”
1	Leadership to me means the ability to lead others who look up to you and work with them (and not above them) for the cause of a common goal.
2	Leadership to me, is all about the example you set for others. I believe leadership is about effective communicating and engaging individuals in a conversation. So they may not only listen, but feel open to contribute their own idea.
3	Leadership is about helping guide a group towards a common goal, with the group working as a cohesive team. Leaders lead by example and don't look for recognition. When the goal is reached, the group should say "we did this".

Text Mining Activity 2: Preprocess the Data

The second text-mining activity, preprocessing the data, includes a variety of tasks that provide structure to the digitized corpus of documents and make necessary modifications prior to analysis.

Tokenization. The first task, which often happens behind the scenes of text mining software programs, is tokenization. Tokenization is the process by which discrete words (or “tokens”) are identified among all characters in unstructured text data, mostly

through identification and separation of punctuation marks, contractions, and abbreviations (Ignatow & Mihalcea, 2017; Miner et al., 2012). This process ensures, for instance, that the researcher captures uses of a period aside from its regular use as an end-of-sentence marker; examples include abbreviations (e.g., U.S.) or titles (e.g., Ms.). Case normalization—for instance, ensuring all words appear in lower case—and determining word and sentence boundaries—with white space and punctuation marks—are often included in the tokenization process (Ignatow & Mihalcea, 2017). As another example, the first two sample responses shown in Table 3.8 use the word "me," however example two follows that word with a comma while example one does not. Tokenization will ensure both words are recognized in the same way. The number of tokens, average words per non-empty case, and other collection statistics for this sample are shown in Table 3.9.

Table 3.9. Summary of collection statistics for text mining open-ended leadership question.

Item	Statistic
Total number of cases recognized by WordStat	76,660
Total number of non-empty cases	67,160
Total number of words (tokens)	1,302,709
Total words excluded	830,919
Percentage of words excluded	63.8
Words per non-empty case	19

Creating stop- and include-word lists. The second task is to generate two word lists: a stop-word list and an include-word list (Miner et al., 2012). A stop-word (or exclusion) list instructs the software program to ignore certain high-frequency words such as articles, pronouns, conjunctions, prepositions, and other words commonly found in natural language that have little substantive interest and therefore are irrelevant to text analysis (Ignatow & Mihalcea, 2017). Looking at the examples in Table 3.8, words that are likely to be excluded include: *to*, *the*, *is*, *a*, *and*, *about*, and *for*. In WordStat, the stop-

word list is called the exclusion dictionary, and like other text mining software WordStat is preloaded with a stop-word list that users can modify as needed. In this study, participating institutions' names and common abbreviations (e.g., Ohio State, OSU) were added to the exclusion dictionary prior to analyses to protect confidentiality. The final exclusion dictionary removed nearly two-thirds of all words (63.8 percent) from analysis.

An include-word list, or dictionary, can be compiled deductively from words, phrases, or themes present in the literature, or can be drawn inductively from preliminary data analysis. In either case, the dictionary can be used for basic indexing, or more complex clustering and classification analyses (Miner et al., 2012). WordStat refers to its include-word list as a categorization dictionary. In this study, two categorization dictionaries were used. The first, developed inductively, includes clustered categories of workplaces extracted from question ENV2B, as discussed below in the section on text classification. The second dictionary, developed previously by researchers at Harvard and elsewhere, represents distinct subjective mental and emotional states, and is used in sentiment analysis.

Stemming or lemmatization. The next step in preprocessing is to identify and modify words that are related to one another but appear in different grammatical forms (Ignatow & Mihalcea, 2017; Miner et al., 2012). Two similar processes accomplish this goal. Stemming reduces words to their root form—for instance, *help*, *helping*, and *helped* would all be recognized by the word *help*—and therefore reduces the number of distinct terms while simultaneously increasing the frequency that some words appear across the corpus (Miner et al., 2012). The trouble with stemming is that sometimes the root forms "are not valid words," which creates a challenge if subsequent analysis and results will be

interpreted by a person and not a computer (Ignatow & Mihalcea, 2017, p. 55). For instance, the well-known Porter Stemmer tool would reduce both *police* and *policy* to a shared stem *polic*, which cannot then be analyzed meaningfully (Ignatow & Mihalcea, 2017). Lemmatization is a reasonable alternative to stemming, as it reduces words only to valid root forms. For instance, in the second example shown in Table 3.8, *communicating* would be reduced to *communicate* and *engaging* to *engage*. One potential downside to these processes is that thematic analysis may be truncated when prefixes, suffixes, and other grammatical nuances are stripped away. This problem presented itself in the present study in the form of unexpected word substitutions (e.g., changing "of" to "have") during phrase analysis. Therefore the lemmatization dictionary was removed during phrase analysis and principal components analysis. Keyword in context (KWIC) offers the most effective method to ensure nuance is not lost due to lemmatization. KWIC will be described in more detail below.

Normalizing spelling. The final modification to the text is to normalize spelling. This step is optional if the text is mostly free of misspellings, however according to Miner et al. (2012), misspelled words "can lead to an unnecessary expansion in the size of the vector space needed to represent a document," and therefore should be corrected (p. 48). WordStat includes a feature that identifies misspellings and allows the user to substitute a correction or exclude the word from analysis if its correct form is in doubt. All misspelled words that appeared at least 10 times across the corpus were substituted with their correct forms wherever possible. Examples include *everyones* (n=85, missing the apostrophe), *acheive*, and *guidence*. Three words that WordStat considered

misspelled—*mentorship*, *followership*, and *impactful*—were permitted to remain and added to the spelling dictionary.

Identify named entities. The final step in preprocessing involved a search for proper nouns—which WordStat refers to as "named entities"—for additional words to exclude. The software performs this feature in part by capturing words unnecessarily capitalized, such as university abbreviations. Named entities that were permitted to remain during analysis included religious and political terms such as *God* (n=63), *Christ* (n=48), *President* (n=13), and *American* (n=11).

Creating a term-document matrix. The prior steps have prepared the data to be arranged in a term-document matrix (TDM), a two-dimensional "vector representation suitable for input into text mining algorithms" (Miner et al., 2012, p. 50). In a TDM, all unique terms (i.e., words) are arranged in columns, while documents comprise the rows. The numerical occurrence of each term in a given document is calculated as an individual cell value. Before beginning analysis, however, two additional steps are required.

Calculating an inverse document frequency. Raw frequency representations of terms (i.e., cell values) are not necessarily equivalent to their relative importance in the corpus. Put another way, certain words may be used quite frequently and still not reflective of the overall content or themes of the document collection. To illustrate this point, the word *leadership* is used a total of four times by the three respondents quoted in Table 3.8, more frequently than all other substantive words and phrases (e.g., *ability*, *contribute, common goal*). Relying on frequencies alone one would assume that *leadership* more accurately reflects these respondent's definition of the term, irrespective

of its circular logic and the fact that three out of four uses are actually to frame the respondent's conceptualization, which immediately follows.

Therefore count data included in a TDM must be "normalized" in some way, similar to the way continuous variables are divided by a standard deviation in statistical analysis (Miner et al., 2012, p. 83). A number of methods exist, including log frequencies, binary frequencies, and inverse document frequencies (IDF), the latter being the most popular. IDF is a "common and very useful transformation that reflects both the specificity of terms (relative document frequencies) as well as the overall frequencies of their occurrences (transformed term frequencies)" (Miner et al., 2012, p. 83). Often referred to as the term frequency-inverse document frequency (TF-IDF) weighting approach, this method operates under the assumption that words that appear frequently should receive higher weight unless they also appear frequently across all documents (Miner et al., 2012).

Singular value decomposition. The final step in pre-processing data involves reducing the dimensionality (i.e., size) of the matrix to enable more efficient analysis. The vector space is often quite large due to the range of terms in a corpus, yet many cells are empty as specific words may not appear in a given document. Miner et al. (2012) describe three methods for dimensionality reduction: a domain expert reviews all terms and removes those that are irrelevant to the study topic; the researcher eliminates terms with very low relative frequencies; or an algorithm called singular value decomposition (SVD) is used to transform, and thereby reduce, the matrix. SVD is the least labor intensive, and simultaneously extracts features from the text for further analysis, and therefore is recommended.

Conceptually, SVD is an algebraic method that reduces the noise in a large vector space and organizes the data by calculating linear combinations of existing variables. Miner et al. (2012) compare this process to a calculation of a new variable (e.g., area) by multiplying two existing variables (e.g., length and width). Each new combination of variables is designed to extract the "maximum amount of 'information'" from the matrix (Miner et al., 2012, p. 936). Consecutive columns of linear combinations are orthogonal to one another; that is, each contains unique information unrelated to prior combinations. The amount of information contained in the transformed vector space is captured by eigenvalues, which also signal the relative variability between terms and documents (D. Austin, n.d.; Miner et al., 2012).

A close relative of SVD is principal components analysis (PCA), which itself is a form of factor analysis. Both SVD and PCA "extract underlying or 'latent' dimensions that capture most information contained in the full data matrix" (Miner et al., 2012, p. 942). The difference between the two is that PCA relies on a covariance matrix of terms, while SVD relies on the sparse term-document frequency matrix. WordStat extracts the major information contained in the data through PCA, using Varimax rotation. Components are determined when words correlate above a minimum threshold (i.e., the factor loading), in this case 0.3, following recommendations by Tabachnick and Fidell (2007).

Once the term-document matrix is transformed and reduced, a researcher must then decide how many dimensions of new variables to retain for analysis. According to Kaiser's (1960) criterion, all components that carry eigenvalues greater than 1.00 should be retained. However, as described by Field (2013), this method has been criticized for

retaining too many factors. A more conservative estimate of components is obtained by following recommendations from Cattell (1966), where each eigenvalue is plotted against its associated factor in what is called a Scree plot, and only those factors above the inflection point in the graph are retained. The Scree plot is created automatically by WordStat during principal components analysis. Miner et al (2012, p. 943) recommend this path, although they do caution that retaining dimensions beyond the inflection point, or "knee" in the chart, may be useful for subsequent cluster analysis or predictive modeling. After examining the scree plot and the extracted components, this study followed Kaiser's (1960) criterion and retained nearly all components for in-depth analysis.

Text Mining Activity 3: Extract the Knowledge

The third major activity in text mining, knowledge extraction, comprises a wide array of analytic tasks that capture information, patterns, and relationships within the text that is relevant to the research questions, and tests the capacity and accuracy of predictive models drawn from the data. Methods of thematic analysis were employed to investigate definitions of leadership, while text classification methods were used to establish workplace categories for all cases with on-campus workers.

Thematic analysis. Conventional thematic analysis is a means of "identifying, analyzing, and reporting patterns of themes" within a collection of documents (Ignatow & Mihalcea, 2017, p. 75). When a collection of documents is large enough that manual coding is impractical, text mining software can draw upon a variety of tools to efficiently and inductively extract themes (Delen & Crossland, 2008; He, 2013; Ignatow & Mihalcea, 2017; Ryan & Bernard, 2003). This goal is accomplished through several

"unsupervised" learning methods; unsupervised means the algorithm does not require any training data in order to analyze text. The common thread among each of the methods described below is the identification of "repeatable clusters or dimensions" in a collection of texts, from which themes may be inferred (Miner et al., 2012, p. 918). Four methods of thematic analysis—univariate frequency, principal components, cluster, and sentiment analysis—were used to examine responses to the open-ended survey item requesting a definition of the term leadership. Crosstabs were examined to determine if variation in conceptualizations of leadership was present among working and non-working students.

Univariate frequency analysis. Highlighting the most common words and phrases is the initial step in uncovering themes. Although more instances of a unique word do not necessarily mean it is of greater importance to uncovering a theme, count data provide an initial impression of the concepts and suggest a vocabulary range within the corpus. The most frequent words in natural language are usually stop-words (e.g., conjunctions, prepositions), and once those are removed, perhaps surprisingly, the vocabulary of a given corpus is fairly limited. Heap's law speaks to this feature of natural language: the number of unique words does not grow in linear fashion along with an increase in number of words in a corpus, as words are repeated; rather, the relationship is curvilinear though never fully plateaus (Ignatow & Mihalcea, 2017). The term frequency-inverse document frequency (TF-IDF) weighting feature described above is crucial at this stage in order to determine not only the most frequent words and phrases but which are the most important relative to their presence across the corpus (Miner et al., 2012).

In the present study, univariate frequency was calculated for both words and phrases. A list of the 300 most frequently used words was examined initially. The list was

created from a term-document matrix, composed of all unique words (columns) and documents (rows) in the corpus. The word list was normalized and sorted using the term frequency-inverse document frequency (TF-IDF) weighting method (Miner et al., 2012). This feature uncovers variation among participant responses by weighting more heavily words that appear frequently in a particular document (i.e., participant response), unless these words also happens to appear widely across all documents. The 30 most common words, lemmatized and ranked by TF-IDF, are shown in Table 3.10.

Table 3.10. 30 most frequent words appearing in student definitions of leadership, lemmatized and ranked by TF-IDF.

Word	Frequency	No. Cases	% Cases	TF-IDF
Leadership	31227	27875	35.97	13865.6
Goal	20815	19196	24.77	12614.5
People	18117	16584	21.40	12130.3
Lead	13971	13007	16.79	10828.4
Ability	12512	11870	15.32	10194.6
Leader	7379	5590	7.21	8425.6
Guide	8714	8605	11.10	8317.4
Make	6426	5933	7.66	7171.2
Good	4874	4470	5.77	6038.6
Person	4780	4358	5.62	5974.8
Achieve	4592	4471	5.77	5688.7
Charge	4165	4076	5.26	5327.1
Set	3783	3664	4.73	5013.6
Accomplish	3584	3494	4.51	4823.8
Task	3403	3213	4.15	4704.1
Positive	3440	3330	4.30	4701.8
Follow	3427	3291	4.25	4701.5
Role	3330	3222	4.16	4599.1
Action	3269	3086	3.98	4576.1
Situation	3223	3037	3.92	4534.1
Individual	3129	2863	3.69	4482.0
Inspire	3146	3077	3.97	4407.9
Influence	2891	2828	3.65	4156.6
Idea	2710	2462	3.18	4059.4
Decision	2720	2515	3.25	4049.3
Organize	2773	2749	3.55	4021.0
Direction	2753	2707	3.49	4010.4
Responsibility	2689	2595	3.35	3966.6
Effectively	2502	2489	3.21	3736.0
Community	2438	2275	2.94	3735.6

Next a list of all phrases was examined. A phrase was defined as at least two words, and no more than nine words, that appeared at least three times across the corpus. The resulting list contained over 15,000 entries. This list was also sorted by TF-IDF, and 30 of the most common phrases were selected for substantive interest and presented in Table 3.11. Phrases that were excluded lacked narrative coherence, such as *means taking* or *ability to effectively*. The two most frequent phrases, also excluded from the table, were *leadership means* and *leadership is the ability*, since each was employed at the start of many participants' responses.

Feature extraction through principal components analysis. The next step in thematic analysis is to revisit the term-document matrix (TDM) that was simplified during the pre-processing stage. As described above, employing SVD or PCA removes much of the noise from an unwieldy vector space and identifies the "essence" of information contained in two or more correlating variables (Miner et al., 2012, p. 915). Once the algorithm has extracted the principal components from the previously unstructured text, and a visual inspection of a Scree plot has suggested the number of factors to retain, the components themselves must be analyzed in detail. This process is referred to as feature extraction; features can be defined as "latent dimensions of meaning" (Miner et al., 2012, p. 916). Feature extraction aims to answer the following questions: What words and phrases group together in this corpus? What is the unique information contained in each grouping of words and phrases? What words and phrases are significant across multiple components? Are there variations in each component across independent variables? What themes appear to be taking shape within this corpus? As one possible example, two of the definitions provided in Table 3.8 use the phrase

common goal. If this trend were widespread throughout the corpus, these words might hang together as principal components of a reduced matrix.

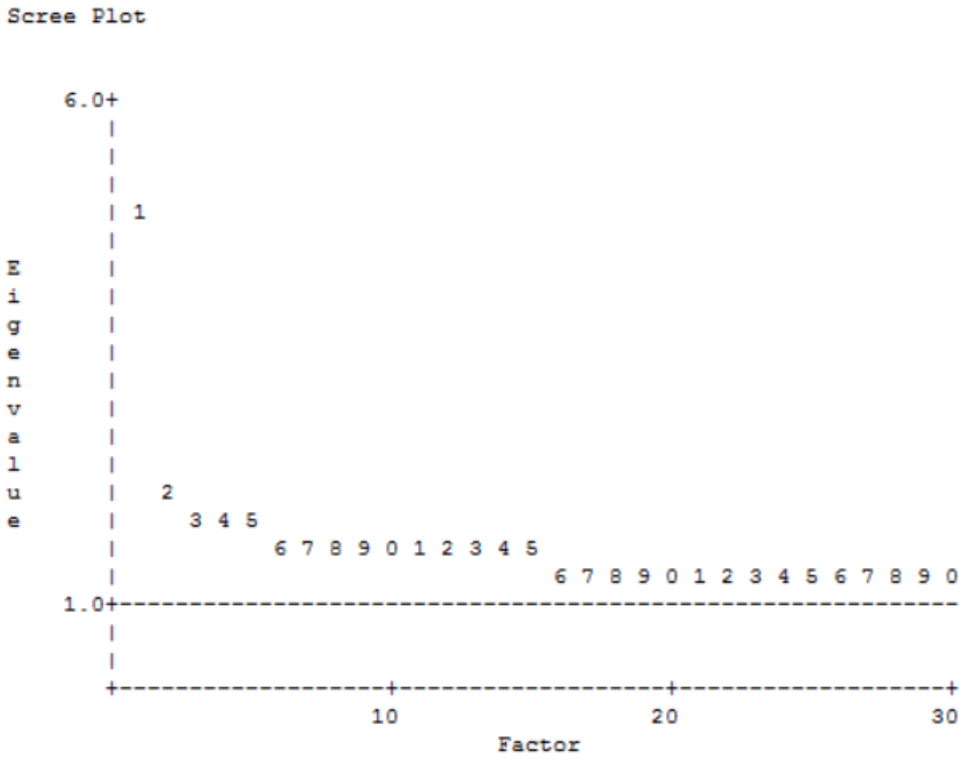
Table 3.11. A selection of 30 common phrases appearing in student definitions of leadership, not lemmatized, and ranked by TF-IDF.

Phrase	Frequency	No. Cases	% Cases	TF-IDF
Role model	2018	2012	2.60	3199.8
Taking charge	1302	1297	1.67	2312.7
Achieve a common goal	1236	1236	1.60	2221.4
Ability to lead	1177	1176	1.52	2140.8
Ability to guide	968	967	1.25	1842.9
Lead a group of people	795	795	1.03	1581.2
Reach a common goal	688	688	0.89	1411.5
Greater good	575	575	0.74	1224.5
Achieve a goal	572	571	0.74	1219.8
Taking responsibility	569	567	0.73	1215.2
Accomplish a common goal	538	538	0.69	1161.3
Accomplish a goal	534	533	0.69	1154.8
Make decisions	516	511	0.66	1125.3
Leading a group of people	514	513	0.66	1120.1
Good leader	498	454	0.59	1111.6
Lead people	501	497	0.64	1098.6
Taking control	496	495	0.64	1088.5
Ability to inspire	492	492	0.63	1081.1
People towards a common goal	471	471	0.61	1043.8
Control of a situation	449	449	0.58	1004.4
Make a difference	435	426	0.55	983.0
Guide a group of people	424	424	0.55	959.0
Ability to influence	418	418	0.54	948.1
Guide people	404	404	0.52	922.3
Charge of a situation	376	376	0.49	870.1
Ability to motivate	362	362	0.47	843.7
Ability to organize	340	339	0.44	802.1
Positive change	336	334	0.43	794.8
Leadership is the ability to guide	321	321	0.41	764.9
Making decisions	302	301	0.39	728.0

In the present study, features were extracted using the results of principal components analysis, with a minimum factor loading of 0.3 (Tabachnick & Fidell, 2007). WordStat examined the entire corpus one sentence at a time and returned 60 components

with an eigenvalue greater than 1.0. After examining the Scree plot (see Figure 3.2), I decided to follow Kaiser's (1960) criterion and examine all components for substantive interest, rather than follow Cattell's (1966) recommendation to only examine the one or two components above the inflection point.

Figure 3.2. Principal Components Analysis scree plot.



Preliminary analysis suggested 56 of the 60 components—hereafter referred to as topics—should be retained and explored for thematic content. Each topic was catalogued using its keywords, eigenvalue, the number and percent of cases in which the topic appeared, its relationship to the social change model of leadership, and sample quotes. After reviewing a random number of participant quotes for each topic, a summative judgment was made as to whether the topic reflected leadership theories grounded in the industrial or post-industrial paradigms, or reflected a middle ground between them.

Keyword in context (KWIC). Among the most helpful tools for thematic analysis is the keyword in context (KWIC) feature. KWIC will display every instance where a selected word or phrase appears, along with a certain number of words that appear before and after (Ignatow & Mihalcea, 2017). This visualization is vital for the proper disambiguation of text, where semantic and syntactic differences in word usage can be parsed in light of the surrounding context within which it is used. Similarly, KWIC also can be used to capture noteworthy quotes that illustrate distinct themes, and was used in the present study to highlight participant quotes that effectively illustrate each component extracted through PCA. (See chapter four for a lengthy discussion and accompanying tables.) The examples shown in Table 3.8 are an exact replica of what would appear in a KWIC list if a search were conducted for any of the substantive words used in each response.

Cluster analysis. Miner et al. (2012) refer to clustering as "arguably the oldest technology in text mining" (p. 959), and trace its usage from World War II to contemporary internet search engines. The process of clustering is unsupervised, and can be used to successfully group similar words (a process referred to as concept extraction or topic modeling) or similar documents (a process referred to as document or text clustering). Clustering algorithms require the researcher to select a method to determine similarity among items, and a method for comparing similarity across all items included in the analysis. Additionally, the number of clusters is usually determined a priori. WordStat employs hierarchical clustering—one of three main types of clustering algorithms along with partitional (e.g., k-means clustering) and spectral clustering—and calculates a similarity matrix using Jaccard's coefficient. In hierarchical clustering, words

or documents are grouped iteratively based on their similarity (Miner et al., 2012). Several tools can be used to visualize clustered relationships among words and documents, including concept maps and proximity plots. Two in particular—tree graphs and association analysis—merit special consideration.

Dendrogram. A dendrogram, or tree graph, attempts to reproduce the relative distance between all items included in the cluster analysis (Miner et al., 2012). More specifically, the algorithm that underlies the hierarchical tree graph computes a distance matrix between terms, and begins a process of grouping terms that are most similar or nearest one another. The matrix then recalculates, and the next two terms that are closest to one another combine. The process continues until all words slated for analysis have been clustered (Miner et al., 2012). A dendrogram was created in the present study and a portion is reproduced in chapter four.

Association/Link analysis. Association or link analysis is another method for identifying words or phrases that frequently co-occur. Association analysis is sometimes called "market basket" analysis, because this method is conventionally used to learn more about purchasing behavior—specifically, which items are typically purchased together (Feldman & Sanger, 2007; Miner et al., 2012; Romero & Ventura, 2007). Association rules are developed from this method, stating roughly "if A, then B." Describing a market basket analogy to text mining, Feldman and Sanger (2007) suggest a hypothetical rule that "25 percent of the transactions that contain pretzels also contain soda; 8 percent of all transactions contain both items" (p. 25). In a collection of documents, the association rules relate words, phrases, or themes, rather than products. WordStat relies on its similarity matrix and corresponding Jaccard's coefficients to create a multi-dimensional

network graph that illustrates significant associations, approximates distance between associated words, and indicates the strength of the association. Association analysis was conducted in this study using the link analysis feature of WordStat, and resulting network graphs are reproduced in chapter four.

Sentiment analysis. Uncovering subjective mental and emotional states of being is possible through sentiment analysis. At its root, this process identifies private (i.e., unobservable) statements and the attendant polarity of each along several dimensions (e.g., positive-negative), which then permits the researcher to judge the extent to which each document is expressing a subjective belief or opinion (Ignatow & Mihalcea, 2017). In this study, a widely-used lexical resource known as the General Inquirer (Stone, Dunphy, & Smith, 1966), which includes approximately 10,000 words grouped into 180 categories, is used to investigate respondents' subjectivity or sentiment (Ignatow & Mihalcea, 2017).

During data cleaning and preparation of the General Inquirer for use in this study, it became apparent that some overlap was present among categories—that is, some words appeared in multiple categories. For instance, the category labeled *active* included two entries for the word *answer*: the first captures its usage as a verb, and the second as a noun. Differentiating multiple meanings of a given word was outside the scope of this sentiment analysis, and therefore the category was finalized with one entry for the word *answer*, and this process was repeated for all words with duplicate entries.

Twenty-four lexical categories were selected for use due to their plausible relationship to the content at hand. See Table 3.12 for a detailed list of all categories. Sample categories include words that ascribe a positive outlook (e.g., *ability*,

outstanding), or negative outlook (e.g., *impede*, *lack*), as well as those that suggest strength (e.g., *perfect*, *rise*), weakness (e.g., *deficit*, *insignificant*), and goal orientation (e.g., *destination*, *result*).

Table 3.12. Sentiment analysis categories.

No.	Lexical category[#]	Number of words	Category definition[+]
1	Positiv[1]	1,638	Positive outlook
2	Negativ[1]	2,008	Negative outlook
3	Strong[1]	1,476	Strength
3a^	Power[1]	402	Control, authority
4	Weak[1]	647	Weakness
4a^	Submit[1]	134	Submission, dependence, vulnerability
5	Active[1]	1,572	Possessing autonomy, efficacy, or agency
6	Passive[1]	731	Lacking autonomy, efficacy, or agency
7	Pleasur[2]	151	Enjoyment, confidence, commitment
8	Pain[2]	221	Suffering, lack of confidence or commitment
9	Feel[2]	49	Feelings such as gratitude, apathy; does not include pain or pleasure
10	Arousal[2]	145	Excitation, affiliation; does not including pain or pleasure
11	Emot[2]	302	Broad category of emotion-related words
12	Virtue[2]	638	Moral approval or good fortune
13	Vice[2]	649	Moral disapproval or misfortune
14	Male[3]	56	Men and social roles associated with men
15	Female[3]	41	Women and social roles associated with women
16	Need[4]	66	Need or intent
17	Goal[4]	51	Goals and goal orientation
18	Try[4]	68	Activities taken to reach, but not necessarily attain, a goal
19	Means[4]	218	The means by which goals are attained
20	Persist[4]	58	Persistence, endurance
21	Complet[4]	80	Goal achievement
22	Fail[4]	133	Goals not achieved

[#] complete word list for each category available from Harvard's General Inquirer "augmented" categorization dictionary (URL: http://www.wjh.harvard.edu/~inquirer/homecat.htm)

[+] category definitions available at http://www.wjh.harvard.edu/~inquirer/homecat.htm

[1] lexical resource: Osgood three semantic dimensions; [2] lexical resource: words of pleasure, pain, virtue, and vice; [3] lexical resource: ascriptive social categories; [4] lexical resource: motivation-related words.

^ denotes subcategory

Text/Document classification. Text or document classification is an automatic process of assigning labels or keywords to a document based on the presence of specific words or phrases. A classic example is email spam filtering, where an algorithm examines email text and determines if the message is routed to the inbox or flagged as spam. In text mining this process is more precisely called text categorization, as the underlying algorithm works to find the correct topic or theme for each document it reviews. This algorithm must be trained by the researcher; in other words, correctly labeled documents are used to specify the "numerical parameters (weights and thresholds)" of a model that will then be applied to documents that have not yet been reviewed (Miner et al., 2012, p. 886). Automatic processes such as classification that require training data are referred to as "supervised" learning mechanisms, in contrast to the methods described above that are unsupervised.

The two most popular algorithms for text classification are Naïve Bayes, which is grounded in probability theory, and Maximum Entropy classifiers, grounded in logistic regression (Ignatow & Mihalcea, 2017; Miner et al., 2012). Both are "efficient for high-dimensional data and have proven to be among the most accurate for text classification" (Miner et al., 2012, p. 886). WordStat includes a classification feature and relies on the Naïve Bayes algorithm. This tool was used in the present study to classify participants automatically across a range of on-campus workplace categories, a necessary antecedent to addressing research question two. From the original sample (n=77,489), 22,138 students who worked on-campus indicated a specific office or department in which they provided the majority of their hours. These locations were provided as a text answer to an open-response item on the MSL and therefore could not easily be recoded into

categorical dummy variables. In order to test associations between workplace locations and leadership capacity and self-efficacy, text classification methods were required in order to extract this information efficiently. Four tasks comprised the classification process: assembling a categorization dictionary, developing a training data set, testing and evaluating several classifiers, and validating and improving the final classifier.

Assembling a categorization dictionary. Before a training data set could be developed, the raw data was sorted into a categorization dictionary. Also known as an include-word list (Miner et al., 2012), a categorization dictionary is similar to a qualitative codebook. WordStat would present all words and phrases that appeared across the corpus of documents, weighted using the term frequency-inverse document frequency (TF-IDF) method as discussed above. All words that appeared at least 10 times across the corpus were sorted inductively into categories of workplaces. Subjective decisions were made throughout this process. For example, admissions and financial aid offices were grouped into one category, while housing and food service offices were permitted to remain separate. The primary criteria for sorting was coherence: the words used to denote specific workplaces should be similar within categories and simultaneously distinctive from words used in other categories. In the aggregate, categories should likewise be distinctive from one another.

Many words were added to the exclusion dictionary during the sorting process as well, when it became clear that they were unhelpful in developing a classification algorithm. Examples include position-specific (as opposed to location-specific) words like *manager*, *consultant*, and *supervisor*; departments or facilities with proper names (e.g., *William*) or indecipherable acronyms (e.g., *FAC*); words of secondary importance

(e.g., *team* in the phrase *football team*); and words too generic to label with certainty (e.g., *west*, *den*).

In the end, 14 coherent categories comprised the dictionary: Academics; Academic Support; Admissions and Financial Aid; Administration; Alumni Relations and Development; Athletics, Recreation, and Wellness programs; Auxiliary Services; Food Service; IT and Technology Services; Library; Public Safety; Residential Life; Spiritual Life; Student Affairs. This dictionary captured 80.2 percent of non-excluded words, a satisfactory metric identified in early content analysis work using similar methods (Bengston & Xu, 1995).

Developing a training data set. A categorization dictionary is not enough, by itself, to run a classification model. A supervised process like classification required the development of a training data set, using previously classified documents or cases, from which the algorithm could learn. To construct a training data set, workplace labels were applied manually to just under half of the participants who reported holding an on-campus job (n=10,760). Similar to assembling a categorization dictionary, subjective decisions are involved in this process too. For example, some participants listed a workplace that implicated more than one category, such as *technology department of the library* or *ResLife Technology Operations*. In both cases, these were labeled as IT and Technology Services, because this distinction seemed the privilege the more specific functional unit provided by the available text.

Testing and evaluating several classifiers. The next step involved building, testing, and evaluating several classifiers to see which was most effective in predicting a new independent variable called “workplace.” Twenty-folds cross-validation, a well-

supported method by which an algorithm is tested on random samples of the data, in this case 20 times, was employed (Miner et al., 2012). WordStat was instructed to include all features of the categorization dictionary as well as the training data set. The specific learning method was set to Naïve Bayes, the specific statistic selected was case occurrence, and each occurrence was weighted by inverse document frequency.

WordStat returned several statistics to assess the accuracy of the classifier from different perspectives: precision, recall, nominal and ordinal accuracy, average precision, and average recall (Provalis Research, 2015). Precision indicates the probability that the algorithm correctly labels a new case (among the 11,378 cases that were not coded manually), while recall indicates the probability that previously-labeled documents (i.e., from the training data set) will be identified accurately. Precision and recall statistics were provided for each of the 14 categories within the "workplace" variable. Nominal and ordinal accuracy are global measures of the algorithm's success. Nominal accuracy indicates the proportion of documents that were correctly classified, while ordinal accuracy weights errors based on their distance from the correct value; those errors that were nearly correct are counted as partial disagreements. Average precision and average recall are simply the mean precision and recall across all predicted categories (Provalis Research, 2015). After testing several classifiers, the best model produced the following statistics: 9,106 correct; 1,654 incorrect; average precision=0.8649; average recall=0.8339; nominal accuracy=0.8463; ordinal accuracy=0.9277. The final task in this activity involved applying the algorithm to the entire data set, so that each case would have a value on the new independent variable "working."

Improving the classifier. Recognizing that even the best classifier would still fail to accurately label a new case 14 times out of 100 (the precision statistic suggested 86 percent accuracy), an attempt was made to manually improve upon the classifier before applying its results to the MSL data set. Each of the following tasks were performed in Microsoft Excel.

First, all manually-coded workplace values (n=10,760) were retained, since the recall statistic suggested that the classification algorithm mislabeled already classified cases 17 times out of 100. Where a case had not been labeled manually, the predicted value was accepted. Second, all cases that had been classified as IT and Technical Services or Auxiliary Services were reviewed and corrected as needed, as these two categories had the lowest micro-level precision and recall statistics among the 14 categories. Third, a random sample (n=283, or 2.5 percent) of the 11,378 cases which were predicted by the classifier were reviewed manually for accuracy: 226 cases (80 percent) were correctly predicted; 29 cases (10 percent) were incorrectly predicted, and in 28 cases (10 percent) it was impossible to determine if the classifier was correct, usually because the answer provided was an acronym for an unfamiliar program or office. These statistics were considered acceptable and the new variable was added to the existing dataset.

Evaluate the Findings and Deploy the Results

The final two phases of the CRISP-DM as applied to text mining are to evaluate the findings and deploy the results of the study (Miner et al., 2012). Evaluation consists of reviewing each of the major activities to ensure accuracy and precision, revisiting any questionable analyses, and validating the findings in light of the study purpose and the

broader literature. Deploying results in this context would constitute a write-up of the findings (as will be found in chapter four), discussing what practical impact may be evident, and making recommendations for future research (as will be found in chapter five).

Limitations

Propensity score construction. Prior studies of the effects of paid employment are contradictory, in part, because of misspecified or atheoretical models (Riggert et al., 2006), and in the present study the propensity score seems the likeliest place where misspecification could have occurred. Matching participants who work with those who don't on a propensity score is difficult with such a large sample and with so many available covariates. As discussed previously, the selection of covariates is perhaps the most important decision in calculating a propensity score, and environmental covariates (e.g., college experiences; institution-level variables) were not included. Although this decision seemed supported by the literature, to the extent that any environmental covariate could reasonably have been considered a pre-existing or baseline characteristic, the addition of one or more might have altered the propensity score and subsequent treatment weight.

Sample size reduction. A related limitation occurred when two covariates—residential status and traditional/non-traditional age—remained stubbornly imbalanced between treatment and control groups. Ultimately non-residential students and non-traditional aged students were removed from the sample, and this change produced a propensity score that operated with reasonable effectiveness, as measured by standardized bias. This change shifted the distribution of the sample by class year.

Specifically, the largest number were first-year students, and the smallest number were seniors, presumably because more advanced students are likely older and a greater percentage choose to live off-campus. The practical implication of this change is that the findings are generalizable among a smaller segment of the college-going population—traditional age, residential students only.

Self-report data and cross-sectional design. It is important to acknowledge that the data are drawn from a cross-sectional survey that relies entirely on self-reported data. As described above, the cross-sectional design is intentional to avoid response shift bias (Howard & Dailey, 1979; Rohs, 2002; Rohs & Langone, 1997), although it is possible that participants did not recall high-school experiences, behaviors, and attitudes accurately (Dugan, 2015). More broadly, the validity of self-reported data is heavily contested, in part due to concerns of social desirability, halo effect, unclear measures, and item format (Dugan, 2015; Bowman & Seifert, 2011; Porter, 2011). Although Dugan (2015) suggests that the MSL has considered and responded to these concerns, they are no doubt a potential limitation.

Absent variables of interest. Certain variables absent from the MSL would have been useful in addressing the present research questions. Specifically, the MSL does not capture detailed locations for off-campus workers. This information would be useful to model variation in leadership capacity for students working in retail, professional, or other types of jobs. Similarly, the MSL does not capture job-specific experiences, such as collaboration, problem solving, or supervision, that have been shown to relate to learning in the workplace (Eraut, 2007; Lewis, 2010). This type of detail would have allowed for

greater nuance in understanding leadership development across varied on-campus workplace environments.

Despite these limitations, this study was worth pursuing because it adds new insights to the discussion of working college students and leadership development. MSL data, despite its potential flaws and limitations, offered a rare opportunity to capture conceptualizations of leadership that have not been explored extensively in prior research. Moreover, the use of secondary data allowed for an appropriately-powered replication study. Replication studies are "relatively rare in higher education, but replicated findings exponentially increase the trustworthiness of the results" (Hevel et al., 2014, p. 243). This study explicitly replicated aspects of the only examination to date of the effects of work on leadership development (Salisbury et al., 2012).

Summary

The present study is concerned with understanding how working students think about leadership as compared with those who do not work, and highlighting relationships between paid employment experiences and leadership capacity. The research questions that guided this study were addressed through text mining and statistical analysis of data collected from the Multi-Institutional Study of Leadership. The following chapter will describe the results of these analyses in detail.

Chapter Four: Results

This study aimed to answer the following overarching research question: How do college students' paid work experiences relate to their leadership capacity and beliefs about leadership? Three additional questions guided the study design and analyses:

1. Among a national sample of college students, what are the characteristics of students who work for pay while enrolled?
2. Do significant associations exist between aspects of the work experience and self-reported capacity or self-efficacy for leadership?
3. Among a national sample of college students, is work status associated with variation in how students conceptualize leadership?

This chapter will present the results of the analysis described in chapter three. Discussion of these results will follow in chapter five.

Research Question 1

The first research question asked: Among a national sample of college students, what are the characteristics of students who work for pay while enrolled? The sample selected for this study comes from the 2015 administration of the Multi-Institutional Study of Leadership (MSL, 2015). To address this question, the data were disaggregated by working status and analyzed descriptively.

Descriptive Statistics

Descriptive statistics for all variables, including variable names and labels, are shown in Table A.2 in the appendix. Before investigating whether relationships exist between aspects of the work experience and capacity or efficacy for leadership (research question 2) or unpacking what students believe about leadership (research question 3) the students who are part of this

particular sample must be understood in greater depth. As shown in Table 4.1, more than half the sample (55 percent) is composed of students who did not report holding a job while attending college. Of the remainder, 30 percent reported working on-campus, 11 percent reported working off-campus, and 4 percent reported holding a job both on-campus and off-campus.

Table 4.1. Work status of residential students under 24 years of age.

	Frequency	Percent
Not working	19804	55.3
Working off-campus	3828	10.7
Working on-campus	10821	30.2
Working both on- and off-campus	1373	3.8
Missing	3	0.0
Total	35829	100.0

Tables 4.2 and 4.3 offer a closer look at the characteristics of the 45 percent of the sample (n=16,022 students) who reported working while attending college. Table 4.2 displays column percentages, while Table 4.3 displays row percentages. Row percentages provided a more useful snapshot of the sample and therefore guided subsequent analysis, because they described variation in work status meaningfully among a fairly homogenous sample; 2015 MSL participants identified overwhelmingly as White/Caucasian and as female. Table 4.4 presents frequency statistics for on-campus workers by workplace.

Participants favor on-campus work. The disaggregation of work status by sex and race are each informative as they demonstrate a distribution of all working students that strongly favors on-campus positions. For instance, more than three times the number of male students and more than two and a half times the number of female students work on-campus as compared with off-campus. Looking at differences across racial and ethnic groups, on-campus jobs are favored 5-to-1 by African American/Black and Asian American students, 3-to-1 by Latinx students, and

Table 4.2. Frequencies and column percentages across demographic categories by working status.

	Not working (N=19,804)	Working off-campus (N=3,828)	Working on-campus (N=10,821)	Working both off- and on-campus (N=1,373)	Total Percent
Sex					
Male	39.0	27.4	31.1	23.8	34.8
Female	60.6	72.3	68.4	75.6	64.8
Trans	0.5	0.3	0.5	0.6	0.4
Race/Ethnicity					
White/Caucasian	71.1	75.4	65.8	71.2	69.9
African-American/Black	4.3	3.8	6.7	6.8	5.1
Latinx	7.8	4.2	7.7	5.4	4.5
Asian American/Asian	3.8	4.9	5.6	4.9	7.3
Multiracial	9.6	10.0	10.8	10.6	10.1
All other races^	3.4	1.9	3.3	1.0	3.1
Class Year					
First-Year students	52.5	33.5	26.4	14.4	41.1
Sophomores	25.6	27.0	31.9	27.2	27.7
Juniors	13.4	21.3	23.2	29.3	17.8
Seniors	8.2	17.5	18.3	28.6	13.0
Parents' Annual Income					
Under $25,000	4.0	6.3	7.9	8.4	5.7
Between $25,000-$55,000	9.6	13.0	14.8	16.8	11.8
Between $55,000-$100,000	19.0	23.6	24.4	26.5	21.4
Above $100,000	40.4	37.2	32.2	32.0	37.3
Not reported[#]	26.9	19.9	20.6	16.2	23.8
Other demographics					
First Generation	9.3	12.9	12.4	13.4	10.8
Disability	10.4	11.5	9.4	11.9	10.3
LGBQ	7.7	7.5	9.9	10.7	8.5
International student	4.3	1.0	3.9	0.3	3.6
Military affiliation	1.2	1.0	0.5	0.7	0.9
Part-time enrollment	0.4	0.9	0.5	1.1	0.5

Note: percent totals may not add to 100% due to rounding; all chi-square tests were significant ($p<.001$).

[^] includes Middle Eastern/North African, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and Race not listed

[#] includes "don't know" and "rather not say"

Table 4.3. Frequencies and row percentages across demographic categories by working status.

	N	Not working	Working off-campus	Working on-campus	Working both off- and on-campus	Total Percent
Sex						
Male	12,455	62.0	8.4	27.0	2.6	34.8
Female	23,204	51.7	11.9	31.9	4.5	64.8
Trans	160	56.3	6.9	31.9	5.0	0.4
Race/Ethnicity						
White/Caucasian	25,044	56.2	11.5	28.4	3.9	69.9
African-American/Black	1,820	46.8	7.9	40.1	5.2	5.1
Asian American	2,624	59.2	6.1	31.9	2.8	4.5
Latinx	1,601	46.4	11.6	37.8	4.2	7.3
Multiracial	3,607	52.9	10.6	32.5	4.0	10.1
All other races^	1,110	60.1	6.4	32.3	1.3	3.1
Class Year						
Freshman	14,738	70.6	8.7	19.4	1.3	41.1
Sophomore	9,938	51.1	10.4	34.8	3.8	27.7
Junior	6,381	41.5	12.8	39.4	6.3	17.8
Senior	4,667	34.9	14.4	42.3	8.4	13.0
Parents' Annual Income						
Under $25,000	2,013	39.4	12.0	42.8	5.7	5.7
Between $25,000-$55,000	4,235	45.1	11.7	37.8	5.4	11.8
Between $55,000-$100,000	7,668	49.0	11.8	34.5	4.7	21.4
Above $100,000	13,347	60.0	10.7	26.1	3.3	37.3
Not reported#	8,544	62.3	8.9	26.1	2.6	23.8
Other demographics						
First Generation	3,863	47.8	12.8	34.6	4.8	10.8
Disability	3,691	56.0	11.9	27.7	4.4	10.3
LGBQ	3,033	50.2	9.5	35.5	4.8	8.5
International student	1,307	64.6	3.0	32.1	0.3	3.6
Military affiliation	340	68.5	11.8	17.1	2.6	0.9
Part-time enrollment	169	42.6	19.5	29.0	8.9	0.5

Note: percent totals may not add to 100% due to rounding; all chi-square tests were significant ($p<.001$).

^ includes Middle Eastern/North African, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and Race not listed

includes "don't know" and "rather not say"

Table 4.4. Frequency statistics of reduced sample by on-campus workplace (n=35,829)

Workplace	Frequency	Percent
Academics and Research	3,005	8.4
Academic Support	802	2.2
Admissions and Financial Aid	601	1.7
Administration	1,280	3.6
Alumni and Development	351	1.0
Athletics, Recreation, and Wellness Programs	1,429	4.0
Auxiliary Services	208	0.6
Food Service	752	2.1
IT and Technical Services	356	1.0
Library	512	1.4
Public Safety	122	0.3
Residence Life	1,475	4.1
Spiritual Life	142	0.4
Student Affairs	1,124	3.1
Not working	23,760	66.1

Note: Reduced sample comprises residential students less than 24 years of age

2.5-to-1 by White/Caucasian students. This trend favoring on-campus work is evident across all demographic categories. Examining within-group differences in on-campus workers, as shown in Table 4.4, the largest number of students work in departments connected to the academic and research functions of their institutions. Additional areas with high numbers of student workers include residence life, athletics, and administrative functions of their institutions.

Female students and students of color work at higher rates. The data suggest that rates of working vary across sex and racial/ethnic categories. For instance, a greater proportion of female-identified students reported being employed (48.3 percent) when compared with students who are male-identified (38 percent). Students of color also appear to be working at higher rates than their White-identified peers. A nearly 10-point gap separates the proportion of white students who are working (43.8 percent) from the proportions of African American/Black students (53.2 percent) and Latinx students (53.6 percent) who are working. Nearly 6 in 10 students who identify as Asian American reported not working, the second-highest category

behind students who were grouped together across multiple racial/ethnic categories with small individual sample sizes.

More students work as they advance academically. The descriptive statistics also suggest that as students persist toward graduation, they are also increasingly employed. This finding is most visible in the sharp drop in the percentage of students not working by class year, including a nearly 20-point decline from freshman (71 percent) to sophomore year (51 percent). By senior year, just 35 percent of students in this sample reported not working, half the number who were not working three years earlier.

As additional students join the workforce, most appear to have found positions on-campus, a finding consistent with the demographic data discussed previously. While the percentage of students working jobs off-campus increased by 2 points each year, on-campus workers advanced by 16 percentage points between freshman and sophomore year, before increasing an additional 4.5 percent and 3 percent, respectively, across the subsequent two years.

The raw number of students working both on- and off-campus is low—just 3.8 percent of the sample—and represents a small fraction of the total students working solely off-campus or solely on-campus. However, when expressed as a percentage of working students within each class year, a nearly five-fold increase from freshman to senior year becomes apparent.

Fewer students from high SES families are employed. When examining the crosstabs for working status by parents' income category, it is apparent that this sample is populated heavily with students from families with higher socioeconomic status. Consonant with that finding, the percentage of students not working increases by half as one climbs the income ladder, from 39 percent (parents' annual income under $25,000) to 60 percent (parents' income above $100,000). A sizable number of respondents (n=8,544, larger than any other group except

the highest income bracket) did not report their parents' income, either because they did not know it or preferred not to say. Curiously, this group had the highest proportion of students not working (62 percent) and the lowest proportion of students working off-campus (9 percent) or both on- and off-campus (2.6 percent).

Summary

Descriptive analysis of the data suggests that the sample is heavily populated by participants who identify as White/Caucasian, female, and come from families with high SES, reflective of national trends in college-going students at four-year institutions (Eagan et al., 2017). Among the 45 percent who reported working while enrolled in college, two-thirds held a job on-campus. The preference for on-campus work was visible across all demographic categories. Disaggregation by demographic variables indicates that more women than men are working, more students of color are working as compared with White-identified peers, students further along in their academic program work at higher rates, and students from higher SES backgrounds work at lower rates.

Research Question 2

The second research question asks: Do significant associations exist between aspects of the work experience and self-reported capacity or self-efficacy for leadership? This question is addressed through the development and evaluation of multi-level regression models.

Hierarchical Linear Models

Hierarchical linear modeling (HLM) was used to test this research question because study participants were nested within 87 colleges and universities across the United States. Results are presented in four models. Models A and C investigated relationships between leadership capacity and working status only, or workplace categories and total hours worked, respectively. Models B

and D investigated relationships between leadership self-efficacy and working status only, or workplace categories and total hours worked, respectively.

Model A: Leadership capacity and work status. The first model explored associations between work status and standardized leadership capacity, which was the dependent variable. Model specifications are shown below.

Level-1 model.

$$ZOMNIBUS_{ij} = \beta_{0j} + \beta_{1j}*(WK\_OFF_{ij}) + \beta_{2j}*(WK\_ON_{ij}) + \beta_{3j}*(WK\_BOTH_{ij}) + \beta_{4j}*(MALE_{ij}) + \beta_{5j}*(TRANS_{ij}) + \beta_{6j}*(AF\_AM_{ij}) + \beta_{7j}*(AS\_AM_{ij}) + \beta_{8j}*(LATINX_{ij}) + \beta_{9j}*(MULTIRAC_{ij}) + \beta_{10j}*(RACE\_OTH_{ij}) + \beta_{11j}*(DISABILI_{ij}) + \beta_{12j}*(INTL_{ij}) + \beta_{13j}*(FIRST\_YR_{ij}) + \beta_{14j}*(SOPHOMOR_{ij}) + \beta_{15j}*(JUNIOR_{ij}) + \beta_{16j}*(INC\_25\_5_{ij}) + \beta_{17j}*(INC\_55\_1_{ij}) + \beta_{18j}*(INC\_ABV_{ij}) + \beta_{19j}*(INC\_NR_{ij}) + \beta_{20j}*(GPA_{ij}) + \beta_{21j}*(PRESRLS_{ij}) + \beta_{22j}*(PREEFF_{ij}) + \beta_{23j}*(PRE4F_{ij}) + \beta_{24j}*(ENV3_{ij}) + \beta_{25j}*(ENV4B_{ij}) + \beta_{26j}*(ENV4D_{ij}) + \beta_{27j}*(ENV4G_{ij}) + \beta_{28j}*(OUTSCB_{ij}) + \beta_{29j}*(ENV6A_{ij}) + \beta_{30j}*(ENV6B_{ij}) + \beta_{31j}*(ENV6C_{ij}) + \beta_{32j}*(ENV6D_{ij}) + \beta_{33j}*(SOCCUL_{ij}) + \beta_{34j}*(ENV10_{ij}) + r_{ij}$$

Level-2 model.

$$\beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}*(UNCLASSI_j) + \gamma_{12}*(COMPETIT_j) + \gamma_{13}*(VHM\_COMP_j) + u_{1j}$$
$$\beta_{2j} = \gamma_{20} + \gamma_{21}*(UNCLASSI_j) + \gamma_{22}*(COMPETIT_j) + \gamma_{23}*(VHM\_COMP_j) + u_{2j}$$
$$\beta_{3j} = \gamma_{30}$$
$$\beta_{4j} = \gamma_{40} + u_{4j}$$
$$\beta_{5j} \rightarrow \beta_{9j} = \gamma_{50} \rightarrow \gamma_{90}$$
$$\beta_{10j} = \gamma_{100} + u_{10j}$$
$$\beta_{11j} = \gamma_{110} + u_{11j}$$
$$\beta_{12j} = \gamma_{120} + u_{12j}$$
$$\beta_{13j} = \gamma_{130}$$
$$\beta_{14j} = \gamma_{140} + u_{14j}$$
$$\beta_{15j} \rightarrow \beta_{16j} = \gamma_{150} \rightarrow \gamma_{160}$$
$$\beta_{17j} = \gamma_{170} + u_{17j}$$
$$\beta_{18j} \rightarrow \beta_{19j} = \gamma_{180} \rightarrow \gamma_{190}$$
$$\beta_{20j} = \gamma_{200} + u_{20j}$$
$$\beta_{21j} = \gamma_{210} + u_{21j}$$
$$\beta_{22j} = \gamma_{220} + u_{22j}$$
$$\beta_{23j} = \gamma_{230} + u_{23j}$$
$$\beta_{24j} = \gamma_{240} + u_{24j}$$
$$\beta_{25j} = \gamma_{250} + u_{25j}$$
$$\beta_{26j} = \gamma_{260} + u_{26j}$$
$$\beta_{27j} = \gamma_{270} + u_{27j}$$
$$\beta_{28j} = \gamma_{280} + u_{28j}$$
$$\beta_{29j} = \gamma_{290} + u_{29j}$$

$\beta_{30j} = \gamma_{300} + u_{30j}$
$\beta_{31j} = \gamma_{310}$
$\beta_{32j} = \gamma_{320} + u_{32j}$
$\beta_{33j} = \gamma_{330} + u_{33j}$
$\beta_{34j} = \gamma_{340} + u_{34j}$

Reliability estimates for predicting the intercept and any randomly varying slope ranged from 0.22 to 0.77. Table 4.5 displays fixed effects and cross-level interactions, while Table 4.6 displays the random effects.

Fixed effects. Working has a significant, negative relationship with self-reported capacity for socially responsible leadership. Controlling for demographic, retrospective, and environmental covariates, working off-campus or in both locations is associated with a reduction in standardized leadership capacity scores of approximately 0.15 standard deviations. Working on-campus is associated with a slightly larger reduction in standardized leadership capacity scores at 0.18 standard deviations.

Cross-level interactions. Institutional selectivity was the only significant predictor of the level-1 slope for working off-campus. Specifically, the increment to the slope for students working off-campus at an institution with unclassified selectivity (when compared against peers at colleges classified as less competitive) results in a steeper predicted drop in leadership capacity scores, to 0.33 standard deviations below the mean. Similarly, the slope for working off-campus also decreases for students at institutions labeled very competitive, highly competitive, or most competitive, when compared to the same reference group, to 0.25 standard deviations below the mean. No level-2 covariates were found to significantly predict the level-1 slope for working on-campus, however the selectivity covariates were included in order to keep the model consistent across both randomly-varying slopes. Therefore, this variation cannot be explained with the available covariates.

Table 4.5. Model A: Relationships between work status and standardized leadership capacity: Fixed effects and cross-level interactions.

	Model 1 Work variables only		*Model 2 Student -level*		*Model 3 Student- and Institution-Level*	
	Coeff	(SE)	Coeff	(SE)	Coeff	(SE)
Intercept	0.05**	(0.01)	-0.00	(0.01)	-0.00	(0.01)
Working off-campus^						
Intercept2	-0.11***	(0.02)	-0.15***	(0.02)	-0.15***	(0.01)
Selectivity unclassified					-0.18***	(0.04)
Selectivity competitive					-0.07	(0.04)
Selectivity very, highly, most competitive					-0.10*	(0.04)
Working on-campus^						
Intercept2	-0.11***	(0.02)	-0.18***	(0.01)	-0.18***	(0.01)
Selectivity unclassified					0.03	(0.06)
Selectivity competitive					0.03	(0.05)
Selectivity very, highly, most competitive					-0.01	(0.05)
Working both on- and off-campus	0.09**	(0.03)	-0.15***	(0.03)	-0.15***	(0.03)
Male^			-0.12***	(0.01)	-0.12***	(0.01)
Transgender			-0.12	(0.10)	-0.12	(0.10)
Black/African-American			0.04	(0.02)	0.04	(0.02)
Asian/Asian-American			-0.07***	(0.02)	-0.07***	(0.02)
Latinx			0.03	(0.03)	0.03	(0.03)
Multiracial			-0.03	(0.02)	-0.03	(0.02)
All other races^			-0.15***	(0.04)	-0.15***	(0.04)
Self-reported disability^			-0.08***	(0.02)	-0.09***	(0.02)
International student^			-0.15***	(0.03)	-0.15***	(0.03)
First-year student			-0.04	(0.02)	-0.04	(0.02)
Sophomore^			-0.06**	(0.02)	-0.06**	(0.02)
Junior			-0.03	(0.02)	-0.03	(0.02)
Parents' income between $25,000-$55,000			0.02	(0.02)	0.02	(0.02)
Parents' income between $55,000-$100,000^			0.05*	(0.02)	0.04*	(0.02)
Parents' income above $100,000			0.04	(0.02)	0.04	(0.02)
Parents' income not reported			0.02	(0.02)	0.02	(0.02)
Retrospective scale: Leadership capacity^			0.10***	(0.00)	0.10***	(0.00)
Retrospective scale: Leadership self-efficacy^			0.21***	(0.01)	0.21***	(0.01)
Retrospective scale: Social change activity^			-0.04***	(0.01)	-0.04***	(0.01)
Community Service^			0.06***	(0.01)	0.06***	(0.01)
GPA^			-0.07***	(0.01)	-0.07***	(0.01)
Practicum, internship, field experience^			0.03**	(0.01)	0.03*	(0.01)
Living-learning program^			-0.06***	(0.01)	-0.06***	(0.01)
Culminating senior experience^			0.05*	(0.02)	0.05*	(0.02)
Social change behaviors scale^			0.18***	(0.01)	0.18***	(0.01)
Involved member in college organizations^			0.06***	(0.01)	0.06***	(0.01)
Leadership role in college organizations^			0.02***	(0.00)	0.02***	(0.00)
Involved member in off-campus org			0.02***	(0.00)	0.02***	(0.00)
Leader in off-campus organization^			-0.03***	(0.01)	-0.03***	(0.01)
Socio-cultural conversations scale^			0.27***	(0.01)	0.27***	(0.01)
Leadership experiences^			0.05***	(0.01)	0.05***	(0.01)
Deviance (# parameters)	100418.93 (6)		78806.08 (312)		78801.14 (318)	

*p<.05, **p<.01, ***p<.001

^ denotes randomly varying slopes in models 2 and 3

Table 4.6. Model A: Relationships between work status and standardized leadership capacity: Random effects

Random effect variance component	*Unconditional Model*	*Model 1 Work variables only*	*Model 2 Student-level*	*Model 3 Student- and Institution-Level*
Variance among colleges (τ_{00})	0.014***	0.013***	0.008***	0.008***
Working off-campus slope (τ_{10})			0.006*	0.006*
Working on-campus slope (τ_{20})			0.003**	0.003**
Male slope			0.004**	0.004*
All other races slope			0.039*	0.038*
Disabilities slope			0.008**	0.008**
International student slope			0.024*	0.024*
Sophomore slope			0.005***	0.005***
Parents' income between $55,000-$100,000			0.005***	0.005***
GPA slope			0.001**	0.001**
Retrospective scale leadership capacity slope			0.000***	0.000***
Retrospective scale leadership efficacy slope			0.004***	0.004***
Retrospective scale social change slope			0.001**	0.001**
Community service			0.005**	0.005**
Practicum, internship, field experience slope			0.007***	0.007***
Living-learning program slope			0.006**	0.006**
Culminating senior experience slope			0.013***	0.013***
Social change behaviors scale slope			0.003***	0.003***
Involved member in college org slope			0.001***	0.001***
Leadership role in college org slope			0.001***	0.001***
Leader in off-campus org slope			0.001**	0.001**
Socio-cultural conversations scale			0.002*	0.002*
Leadership experiences slope			0.006***	0.006***
Variance among participants (σ^2)	0.999	0.992	0.530	0.530
Intra-class correlation coefficient	1.4%	1.3%	1.5%	1.5%
% residual τ_{00}explained				38.5%
% total variance explained	-	0.7%	46.3%	46.8%

*p<.05, **p<.01, ***p<.001

Random effects. The student- and institution-level model explained 46.8 percent of the variance in standardized leadership capacity scores. This total can be divided into 46.3 percent of the between-person variance at level-1 and 38.5 percent of the residual variation among institutions. As indicated by the small initial ICC (1.4 percent), most of the variance in SRLS scores is found among participants, at level-1, and in keeping with the scope of this question, there was no attempt to explain variance in level-1 slopes of variables unrelated to working. Therefore significant variation remains in standardized leadership capacity scores, primarily among participants, that warrants further modeling with level-1 and level-2 covariates.

Furthermore, the inclusion of level-2 variables did not explain any additional variation in the relationships between leadership capacity and working off-campus (τ_{10}) or working on-campus (τ_{20}); in other words the unconditional and conditional variance components for both slopes were identical.

Model B: Leadership self-efficacy and work status. The second model explored associations between work status and standardized self-efficacy for leadership, which was the dependent variable. The model specifications are shown below.

Level-1 model.

$$ZOUTEFF_{ij} = \beta_{0j} + \beta_{1j}*(WK\_OFF_{ij}) + \beta_{2j}*(WK\_ON_{ij}) + \beta_{3j}*(WK\_BOTH_{ij}) + \beta_{4j}*(MALE_{ij}) + \beta_{5j}*(TRANS_{ij}) + \beta_{6j}*(AF\_AM_{ij}) + \beta_{7j}*(AS\_AM_{ij}) + \beta_{8j}*(LATINX_{ij}) + \beta_{9j}*(MULTIRAC_{ij}) + \beta_{10j}*(RACE\_OTH_{ij}) + \beta_{11j}*(DISABILI_{ij}) + \beta_{12j}*(INTL_{ij}) + \beta_{13j}*(FIRST\_YR_{ij}) + \beta_{14j}*(SOPHOMOR_{ij}) + \beta_{15j}*(JUNIOR_{ij}) + \beta_{16j}*(INC\_25\_5_{ij}) + \beta_{17j}*(INC\_55\_1_{ij}) + \beta_{18j}*(INC\_ABV_{ij}) + \beta_{19j}*(INC\_NR_{ij}) + \beta_{20j}*(GPA_{ij}) + \beta_{21j}*(PRESRLS_{ij}) + \beta_{22j}*(PREEFF_{ij}) + \beta_{23j}*(PRE3C_{ij}) + \beta_{24j}*(PRE4D_{ij}) + \beta_{25j}*(PRE4G_{ij}) + \beta_{26j}*(ENV3_{ij}) + \beta_{27j}*(ENV4B_{ij}) + \beta_{28j}*(ENV4D_{ij}) + \beta_{29j}*(OUTSCB_{ij}) + \beta_{30j}*(ENV6A_{ij}) + \beta_{31j}*(ENV6B_{ij}) + \beta_{32j}*(ENV7J_{ij}) + \beta_{33j}*(SOCCUL_{ij}) + \beta_{34j}*(ENV10_{ij}) + \beta_{35j}*(ENV10A3_{ij}) + r_{ij}$$

Level-2 model.

$$\beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}*(ALL\_RESE_j) + \gamma_{12}*(MASTERS_j) + \gamma_{13}*(SIZE\_BEL_j) + \gamma_{14}*(SIZE\_5K_j) + \gamma_{15}*(SIZE\_10K_j) + \gamma_{16}*(UNCLASSI_j) + \gamma_{17}*(COMPETIT_j) + \gamma_{18}*(VHM\_COMP_j) + \gamma_{19}*(SUBURB_j) + \gamma_{110}*(TOWN_j) + u_{1j}$$
$$\beta_{2j} = \gamma_{20} + \gamma_{21}*(ALL\_RESE_j) + \gamma_{22}*(MASTERS_j) + \gamma_{23}*(SIZE\_BEL_j) + \gamma_{24}*(SIZE\_5K_j) + \gamma_{25}*(SIZE\_10K_j) + \gamma_{26}*(UNCLASSI_j) + \gamma_{27}*(COMPETIT_j) + \gamma_{28}*(VHM\_COMP_j) + \gamma_{29}*(SUBURB_j) + \gamma_{210}*(TOWN_j) + u_{2j}$$
$$\beta_{3j} = \gamma_{30}$$
$$\beta_{4j} = \gamma_{40} + u_{4j}$$
$$\beta_{5j} \rightarrow \beta_{6j} = \gamma_{50} \rightarrow \gamma_{60}$$
$$\beta_{7j} = \gamma_{70} + u_{7j}$$
$$\beta_{8j} \rightarrow \beta_{10j} = \gamma_{80} \rightarrow \gamma_{100}$$
$$\beta_{11j} = \gamma_{110} + u_{11j}$$
$$\beta_{12j} \rightarrow \beta_{14j} = \gamma_{120} \rightarrow \gamma_{140}$$
$$\beta_{15j} = \gamma_{150} + u_{15j}$$
$$\beta_{16j} \rightarrow \beta_{19j} = \gamma_{160} \rightarrow \gamma_{190}$$
$$\beta_{20j} = \gamma_{200} + u_{20j}$$
$$\beta_{21j} = \gamma_{210} + u_{21j}$$

$\beta_{22j} = \gamma_{220} + u_{22j}$
$\beta_{23j} = \gamma_{230} + u_{23j}$
$\beta_{24j} = \gamma_{240}$
$\beta_{25j} = \gamma_{250} + u_{25j}$
$\beta_{26j} \rightarrow \beta_{27j} = \gamma_{260} \rightarrow \gamma_{270}$
$\beta_{28j} = \gamma_{280} + u_{28j}$
$\beta_{29j} = \gamma_{290}$
$\beta_{30j} = \gamma_{300} + u_{30j}$
$\beta_{31j} \rightarrow \beta_{35j} = \gamma_{310} \rightarrow \gamma_{350}$

Reliability estimates for predicting the intercept and any randomly varying slope ranged from 0.21 to 0.79. Table 4.7 displays fixed effects and cross-level interactions, while Table 4.8 displays the random effects.

Fixed effects. Working has a statistically significant and positive relationship with self-efficacy for leadership, although small beta coefficients suggest these relationships are practically insignificant. Controlling for demographic, retrospective, and environmental covariates, working off-campus (γ_{10}=0.08), on-campus (γ_{20}=0.06), or in both locations (γ_{30}=0.09) is associated with a slight increase in leadership self-efficacy scores above the grand mean.

Cross-level interactions. Four institution-level variables were significant predictors ($p<.05$) of the Level-1 slope for working off-campus. Three out of four were associated with a negative increment to the slope for working off-campus that negated the slight increase in scores described under fixed effects. Specifically, as compared with students at Carnegie baccalaureate institutions, participants at Carnegie master's institutions (γ_{12}= -0.15) are associated with a decrease in the slope for working off-campus and therefore overall self-efficacy for leadership scores that are below the grand mean. A similar result was found for students at college with unclassified selectivity (γ_{16}= -0.19) as compared against students at less competitive institutions, and for students attending colleges in towns (γ_{110}= -0.10) as compared with cities.

Table 4.7. Model B: Relationships between work status and standardized self-efficacy for leadership: Fixed effects and cross-level interactions.

	Model 1 Work variables only		*Model 2 Student-level*		*Model 3 Student- and Institution-Level*	
	Coeff	(SE)	Coeff	(SE)	Coeff	(SE)
Intercept	0.06***	(0.02)	0.00	(0.01)	0.01	(0.01)
Working off-campus^						
Intercept2	0.13***	(0.02)	0.08***	(0.02)	0.08***	(0.01)
Carnegie all research					-0.13	(0.07)
Carnegie master's					-0.15*	(0.06)
Size below 5,000					0.02	(0.07)
Size 5,000-10,000					0.10*	(0.04)
Size 10,000 and above					0.03	(0.04)
Selectivity unclassified					-0.19*	(0.09)
Selectivity competitive					0.01	(0.09)
Selectivity very, highly, most competitive					-0.08	(0.08)
Location suburb					-0.02	(0.03)
Location town					-0.10**	(0.03)
Working on-campus^						
Intercept2	0.12***	(0.02)	0.05***	(0.01)	0.06***	(0.01)
Carnegie all research					-0.02	(0.05)
Carnegie master's					-0.01	(0.04)
Size below 5,000					-0.06	(0.05)
Size 5,000-10,000					-0.05	(0.04)
Size 10,000 and above					-0.04	(0.02)
Selectivity unclassified					-0.16	(0.09)
Selectivity competitive					-0.05	(0.07)
Selectivity very, highly, most competitive					-0.08	(0.06)
Location suburb					0.02	(0.02)
Location town					0.05	(0.04)
Working both on- and off-campus	0.34***	(0.03)	0.08***	(0.02)	0.09***	(0.02)
Male^			0.08***	(0.01)	0.07***	(0.01)
Transgender			-0.17*	(0.08)	-0.16*	(0.08)
Black/African-American			-0.02	(0.02)	-0.02	(0.02)
Asian/Asian-American^			-0.15***	(0.02)	-0.15***	(0.02)
Latinx			-0.03	(0.03)	-0.03	(0.03)
Multiracial			-0.01	(0.02)	-0.01	(0.02)
All other races			-0.14***	(0.03)	-0.14***	(0.03)
Self-reported disability^			-0.11***	(0.02)	-0.11***	(0.02)
International student			-0.13***	(0.03)	-0.13***	(0.03)
First-year student			-0.17***	(0.02)	-0.17***	(0.02)
Sophomore			-0.19***	(0.01)	-0.19***	(0.01)
Junior^			-0.10***	(0.01)	-0.10***	(0.01)
Parents' income between $25,000-$55,000			0.01	(0.03)	0.01	(0.03)
Parents' income between $55,000-$100,000			0.03	(0.02)	0.03	(0.02)
Parents' income above $100,000			0.06*	(0.02)	0.06*	(0.02)
Parents' income not reported			0.00	(0.02)	0.00	(0.02)
Retrospective scale: Leadership capacity^			0.03***	(0.00)	0.03***	(0.00)
Retrospective scale: Leadership self-efficacy^			0.52***	(0.01)	0.52***	(0.01)
Retrospective scale: HS leadership position^			0.05***	(0.01)	0.06***	(0.01)
Retrospective scale: Community leadership			0.01*	(0.01)	0.01*	(0.01)
Retrospective scale: Leadership training^			0.03***	(0.01)	0.02***	(0.01)
Community Service			0.04***	(0.01)	0.04***	(0.01)
GPA^			-0.02***	(0.01)	-0.02***	(0.01)
Practicum, internship, field experience			0.04***	(0.01)	0.04***	(0.01)

Table 4.7 continued. Model B: Relationships between work status and standardized self-efficacy for leadership: Fixed effects

	Model 1 Work variables only		*Model 2 Student-level*		*Model 3 Student- and Institution-Level*	
	Coeff	(SE)	Coeff	(SE)	Coeff	(SE)
Living-learning program^			-0.04**	(0.01)	-0.04**	(0.01)
Social change behaviors scale			0.08***	(0.01)	0.08***	(0.01)
Involved member in college organizations^			0.05***	(0.01)	0.05***	(0.01)
Leadership role in college organizations			0.05***	(0.00)	0.05***	(0.00)
Resident Assistant			0.07***	(0.02)	0.07***	(0.02)
Socio-cultural conversations scale			0.14***	(0.01)	0.14***	(0.01)
Leadership experiences			0.09***	(0.01)	0.09***	(0.01)
Leadership certificate program			0.04*	(0.02)	0.04*	(0.02)
Deviance (# parameters)	98937.08 (6)		80787.77 (142)		80760.75 (162)	

*p<.05, **p<.01, ***p<.001
^denotes randomly varying slopes in models 2 and 3

The one positive increment to the working off-campus slope was associated with students attending institutions with enrollments between 5,000 and 10,000 (γ_{14}=0.10), as compared with much larger universities (enrollment above 20,000).

No level-2 covariates were found to significantly predict the level-1 slope for working on-campus, however the Carnegie classifications, institutional size, institutional selectivity, and location covariates were included in order to keep the model consistent across both randomly-varying slopes. Therefore, this variation cannot be explained with the available covariates.

Random effects. The student- and institution-level model explained 41.5 percent of the total variance in leadership self-efficacy scores. This total can be divided into 40.6 percent of the between-person variance at level-1 and 60 percent of the residual variation among institutions. As indicated by the small initial ICC (1.5 percent), most of the variance in SRLS scores is found among participants at level-1, and in keeping with the scope of this question, there was no attempt to explain variance in level-1 slopes of variables unrelated to working. Therefore significant variation remains in standardized leadership self-efficacy scores, primarily among participants, that warrants further modeling with level-1 and level-2 covariates.

By contrast, the inclusion of level-2 variables explained 33.3 percent of the conditional variance in the relationship between working off-campus (τ_{10}) and leadership self-efficacy and 25 percent of the conditional variance in the relationship between working on-campus (τ_{20}) and leadership self-efficacy.

Table 4.8. Model B: Relationships between work status and standardized self-efficacy for leadership: Random effects

Random effect variance component	*Unconditional Model*	*Model 1 Work variables only*	*Model 2 Student-level*	*Model 3 Student- and Institution-Level*
Variance among colleges (τ_{00})	0.015***	0.016***	0.006***	0.006***
Working off-campus slope (τ_{10})			0.006*	0.004*
Working on-campus slope (τ_{20})			0.004*	0.003*
Male slope			0.004**	0.004**
Asian-American slope			0.009**	0.009**
Disabilities slope			0.010***	0.010***
Junior slope			0.003*	0.003*
GPA slope			0.002***	0.002***
Retrospective scale leadership capacity slope			0.000***	0.000***
Retrospective scale leadership efficacy slope			0.005***	0.005***
Retrospective scale HS leadership slope			0.001**	0.001**
Retrospective scale leadership training slope			0.001*	0.001*
Living-learning program slope			0.007***	0.007***
Involved member in college org slope			0.001***	0.001***
Variance among participants (σ^2)	0.962	0.955	0.565	0.565
Intra-class correlation coefficient	1.5%	1.6%	1.1%	1.1%
% residual τ_{00}explained				60%
% total variance explained	-	0.7%	40.6%	41.5%

*p<.05, **p<.01, ***p<.001

Model C: Leadership capacity and all work variables. The third model explored associations between work status, specific work locations, hours worked, and standardized leadership capacity, which was the dependent variable. The model specifications are shown below.

Level-1 model.

$$ZOMNIBUS_{ij} = \beta_{0j} + \beta_{1j}*(TOTAL\_HR_{ij}) + \beta_{2j}*(WK\_OFF_{ij}) + \beta_{3j}*(WK\_BOTH_{ij}) + \beta_{4j}*(MALE_{ij}) + \beta_{5j}*(TRANS_{ij}) + \beta_{6j}*(AF\_AM_{ij}) + \beta_{7j}*(AS\_AM_{ij}) + \beta_{8j}*(LATINX_{ij}) + \beta_{9j}*(MULTIRAC_{ij}) + \beta_{10j}*(RACE\_OTH_{ij}) + \beta_{11j}*(DISABILI_{ij}) + \beta_{12j}*(INTL_{ij}) + \beta_{13j}*(FIRST\_YR_{ij}) + \beta_{14j}*(SOPHOMOR_{ij}) + \beta_{15j}*(JUNIOR_{ij}) + \beta_{16j}*(INC\_25\_5_{ij}) + \beta_{17j}*(INC\_55\_1_{ij}) + \beta_{18j}*(INC\_ABV_{ij}) + \beta_{19j}*(INC\_NR_{ij}) + \beta_{20j}*(GPA_{ij}) + \beta_{21j}*(PRESRLS_{ij}) + \beta_{22j}*(PREEFF_{ij}) + \beta_{23j}*(PRE4F_{ij}) + \beta_{24j}*(ENV3_{ij}) + \beta_{25j}*(ENV4B_{ij}) + \beta_{26j}*(ENV4D_{ij}) + \beta_{27j}*(ENV4G_{ij}) + \beta_{28j}*(OUTSCB_{ij}) + \beta_{29j}*(ENV6A_{ij}) +$$

β_{30j}*($ENV6B_{ij}$) + β_{31j}*($ENV6C_{ij}$) + β_{32j}*($ENV6D_{ij}$) + β_{33j}*($SOCCUL_{ij}$) + β_{34j}*($ENV10_{ij}$) + β_{35j}*($ACADEMIC_{ij}$) + β_{36j}*($ACAD\_SPT_{ij}$) + β_{37j}*(ADM_FINA_{ij}) + β_{38j}*($ADMIN_{ij}$) + β_{39j}*($ALUM\_DEV_{ij}$) + β_{40j}*(ATH_REC_{ij}) + β_{41j}*(AUX_{ij}) + β_{42j}*($FOOD_{ij}$) + β_{43j}*(IT_TECH_{ij}) + β_{44j}*($LIBRARY_{ij}$) + β_{45j}*(PUB_SFTY_{ij}) + β_{46j}*(RES_LIFE_{ij}) + β_{47j}*($SPRT\_LIF_{ij}$) + β_{48j}*(STU_AFF_{ij}) + r_{ij}

Level-2 model.

$\beta_{0j} = \gamma_{00} + u_{0j}$
$\beta_{1j} = \gamma_{10}$
$\beta_{2j} = \gamma_{20} + \gamma_{21}$*($UNCLASSI_j$) + γ_{22}*($COMPETIT_j$) + γ_{23}*(VHM_COMP_j) + γ_{24}*($RELIGIOU_j$) + u_{2j}
$\beta_{3j} = \gamma_{30}$
$\beta_{4j} = \gamma_{40} + u_{4j}$
$\beta_{5j} \rightarrow \beta_{9j} = \gamma_{50} \rightarrow \gamma_{90}$
$\beta_{10j} = \gamma_{100} + u_{10j}$
$\beta_{11j} = \gamma_{110} + u_{11j}$
$\beta_{12j} = \gamma_{120} + u_{12j}$
$\beta_{13j} = \gamma_{130}$
$\beta_{14j} = \gamma_{140} + u_{14j}$
$\beta_{15j} \rightarrow \gamma_{160} = \gamma_{150} \rightarrow \gamma_{160}$
$\beta_{17j} = \gamma_{170} + u_{17j}$
$\beta_{18j} \rightarrow \beta_{19j} = \gamma_{180} \rightarrow \gamma_{190}$
$\beta_{20j} = \gamma_{200} + u_{20j}$
$\beta_{21j} = \gamma_{210} + u_{21j}$
$\beta_{22j} = \gamma_{220} + u_{22j}$
$\beta_{23j} = \gamma_{230} + u_{23j}$
$\beta_{24j} = \gamma_{240} + u_{24j}$
$\beta_{25j} = \gamma_{250} + u_{25j}$
$\beta_{26j} = \gamma_{260} + u_{26j}$
$\beta_{27j} = \gamma_{270} + u_{27j}$
$\beta_{28j} = \gamma_{280} + u_{28j}$
$\beta_{29j} = \gamma_{290} + u_{29j}$
$\beta_{30j} = \gamma_{300} + u_{30j}$
$\beta_{31j} = \gamma_{310}$
$\beta_{32j} = \gamma_{320} + u_{32j}$
$\beta_{33j} = \gamma_{330}$
$\beta_{34j} = \gamma_{340} + u_{34j}$
$\beta_{35j} \rightarrow \beta_{37j} = \gamma_{350} \rightarrow \gamma_{370}$
$\beta_{38j} = \gamma_{380} + \gamma_{381}$*($UNCLASSI_j$) + γ_{382}*($COMPETIT_j$) + γ_{383}*(VHM_COMP_j) + γ_{384}*($RELIGIOU_j$) + u_{38j}
$\beta_{39j} \rightarrow \beta_{43j} = \gamma_{390} \rightarrow \gamma_{430}$
$\beta_{44j} = \gamma_{440} + \gamma_{441}$*($UNCLASSI_j$) + γ_{442}*($COMPETIT_j$) + γ_{443}*(VHM_COMP_j) + γ_{444}*($RELIGIOU_j$) + u_{44j}
$\beta_{45j} \rightarrow \beta_{48j} = \gamma_{450} \rightarrow \gamma_{480}$

Reliability estimates for predicting the intercept and any randomly varying slope ranged from 0.26 to 0.77. Table 4.9 displays fixed effects and cross-level interactions, while Table 4.10 displays the random effects.

Table 4.9. Model C: Relationships between all work variables and standardized leadership capacity: Fixed effects and cross-level interactions.

	Model 1 Work variables only		Model 2 Student-level		Model 3 Student- and Institution-Level	
	Coeff	(SE)	Coeff	(SE)	Coeff	(SE)
Intercept	0.05**	(0.01)	-0.00	(0.01)	0.00	(0.01)
Total hours per week	0.01***	(0.00)	0.00	(0.00)	0.00	(0.00)
Working off-campus^						
Intercept2	-0.18***	(0.02)	-0.17***	(0.02)	-0.17***	(0.02)
Selectivity unclassified					-0.17**	(0.06)
Selectivity competitive					-0.06	(0.04)
Selectivity very, highly, most competitive					-0.08*	(0.03)
Religious affiliation					0.00	(0.03)
Working both on- and off-campus	0.12***	(0.03)	0.02	(0.02)	0.02	(0.02)
On-campus work: Academics	-0.23***	(0.02)	-0.22***	(0.02)	-0.22***	(0.02)
On-campus work: Academic Support	-0.11**	(0.03)	-0.17***	(0.03)	-0.17***	(0.03)
On-campus work: Admissions, Financial Aid			-0.18***	(0.02)	-0.18***	(0.03)
On-campus work: Administration^						
Intercept2	-0.24***	(0.04)	-0.24***	(0.03)	-0.22***	(0.03)
Selectivity unclassified					-0.32	(0.30)
Selectivity competitive					-0.18	(0.11)
Selectivity very, highly, most competitive					-0.05	(0.10)
Religious affiliation					-0.21***	(0.04)
On-campus work: Alumni, Development	-0.14***	(0.06)	-0.21***	(0.03)	-0.21***	(0.03)
On-campus work: Athletics, Rec, Wellness	-0.18***	(0.03)	-0.20***	(0.02)	-0.20***	(0.02)
On-campus work: Auxiliary Services	-0.23***	(0.06)	-0.21***	(0.05)	-0.21***	(0.05)
On-campus work: Food Services	-0.27***	(0.04)	-0.21***	(0.03)	-0.21***	(0.03)
On-campus work: IT and Technical Services	-0.20***	(0.05)	-0.16***	(0.04)	-0.16***	(0.04)
On-campus work: Library^						
Intercept2	-0.24***	(0.05)	-0.26***	(0.04)	-0.27***	(0.04)
Selectivity unclassified					0.58	(0.31)
Selectivity competitive					0.16	(0.19)
Selectivity very, highly, most competitive					0.20	(0.18)
Religious affiliation					0.08	(0.05)
On-campus work: Public Safety			-0.27***	(0.07)	-0.27***	(0.07)
On-campus work: Residence Life			-0.17***	(0.03)	-0.17***	(0.03)
On-campus work: Spiritual Life			-0.13*	(0.07)	-0.13*	(0.06)
On-campus work: Student Affairs	-0.07*	(0.03)	-0.20***	(0.03)	-0.20***	(0.03)
Male^			-0.12***	(0.01)	-0.12***	(0.01)
Transgender			-0.12	(0.10)	-0.12	(0.10)
Black/African-American			0.04	(0.02)	0.04	(0.02)
Asian/Asian-American			-0.07***	(0.02)	-0.07***	(0.02)
Latinx			0.03	(0.03)	0.03	(0.03)
Multiracial			-0.03	(0.02)	-0.03	(0.02)
All other races^			-0.15***	(0.04)	-0.14***	(0.03)
Self-reported disability^			-0.08***	(0.02)	-0.08***	(0.02)
International student^			-0.15***	(0.03)	-0.15***	(0.03)

Table 4.9 continued. Model C: Relationships between all work variables and standardized leadership capacity: Fixed effects

	Model 1 Work variables only	Model 2 Student-level		Model 3 Student- and Institution-Level	
First-year student		-0.03	(0.02)	-0.03	(0.02)
Sophomore^		-0.06**	(0.02)	-0.06**	(0.02)
Junior		-0.03	(0.02)	-0.03	(0.02)
Parents' income between $25,000-$55,000		0.03	(0.02)	0.02	(0.02)
Parents' income between $55,000-$100,000^		0.05*	(0.02)	0.05*	(0.02)
Parents' income above $100,000		0.04	(0.02)	0.04	(0.02)
Parents' income not reported		0.02	(0.02)	0.02	(0.02)
Retrospective scale: Leadership capacity^		0.10***	(0.00)	0.10***	(0.00)
Retrospective scale: Leadership self-efficacy^		0.21***	(0.01)	0.21***	(0.01)
Retrospective scale: Social change activity^		-0.04***	(0.01)	-0.04***	(0.01)
Community Service^		0.06***	(0.01)	0.06***	(0.01)
GPA^		-0.07***	(0.01)	-0.07***	(0.01)
Practicum, internship, field experience^		0.04**	(0.01)	0.04*	(0.01)
Living-learning program^		-0.06***	(0.01)	-0.06***	(0.01)
Culminating senior experience^		0.04*	(0.02)	0.04*	(0.02)
Social change behaviors scale^		0.18***	(0.01)	0.18***	(0.01)
Involved member in college organizations^		0.06***	(0.01)	0.06***	(0.01)
Leadership role in college organizations^		0.02**	(0.00)	0.02**	(0.00)
Involved member in off-campus org		0.02***	(0.00)	0.02**	(0.00)
Leader in off-campus organization^		-0.03***	(0.01)	-0.03***	(0.01)
Socio-cultural conversations scale		0.27***	(0.01)	0.27***	(0.01)
Leadership experiences^		0.05***	(0.01)	0.05**	(0.01)
Deviance (# parameters)	100259.11 (20)	78789.16 (326)		78768.56 (338)	

*p<.05, **p<.01, ***p<.001
^ denotes randomly varying slopes in models 2 and 3

Fixed effects. Model C improves upon Model A by disaggregating work on-campus into 14 specific departments, while still controlling for demographic, retrospective, and environmental covariates, and produces several interesting findings. First, it suggests that each on-campus work location has a varying, though uniformly and significantly negative, effect on self-reported capacity for socially responsible leadership. At the low end, participants working in spiritual life departments are predicted to self-report leadership capacity scores that are 0.13 standard deviations below the grand mean. At the high end, participants working in the library or public safety departments are predicted to self-report leadership capacity scores that decrease by more than twice that figure (0.27 standard deviations below the grand mean). Second, Model C restates the finding from Model A that off-campus work is associated with self-reported

leadership capacity scores that are 0.17 standard deviations below the grand mean. Third, Model C departs from Model A in that working both on- and off-campus is no longer a significant predictor of standardized leadership capacity scores. Finally, total hours worked per week is not a significant predictor of leadership capacity.

Cross-level interactions. Just three slopes among the seventeen work variables—working off-campus, working on-campus (administration), and working on-campus (library)—passed the three-part test described above and were allowed to vary randomly. As in Model A, institutional selectivity remained the only significant predictor ($p<.05$) of the Level-1 slope for working off-campus. Specifically, the incremental decrease in leadership capacity scores for students working off-campus doubles to 0.34 standard deviations below the mean for those at institutions labeled as unclassified when compared against those classified as less competitive. Identical to Model A, the slope for working off-campus also decreases for students at institutions labeled very competitive, highly competitive, or most competitive, to 0.25 standard deviations below the mean, when compared against students at less competitive colleges.

Institutional religious affiliation is associated with a decrease in the administration slope as compared with participants working in administrative departments at secular institutions, resulting in predicted leadership capacity scores that are 0.43 standard deviations below the mean. No level-2 covariates were found to significantly predict the level-1 slope for working on-campus at the library, however as with earlier models the covariates for institutional selectivity and religious affiliation were included in order to keep the model consistent across all randomly-varying slopes. Therefore, the significant variation in the library slope cannot be explained with the available covariates.

Table 4.10. Model C: Relationships between all work variables and standardized leadership capacity: Random effects

Random effect variance component	*Unconditional Model*	*Model 1 Work variables only*	*Model 2 Student-level*	*Model 3 Student- and Institution-Level*
Variance among colleges (τ_{00})	0.014***	0.013***	0.008***	0.008***
Working off-campus slope (τ_{20})			0.007*	0.007*
On-campus work: Administration slope (τ_{380})			0.024***	0.021***
On-campus work: Library slope (τ_{440})			0.036*	0.038*
Male slope			0.004**	0.004**
All other races slope			0.037**	0.037**
Disabilities slope			0.008**	0.008**
International student slope			0.026*	0.026*
Sophomore slope			0.005***	0.005***
Parents' income between $55,000-$100,000			0.005***	0.005***
GPA slope			0.001**	0.001**
Retrospective scale leadership capacity slope			0.000***	0.000***
Retrospective scale leadership efficacy slope			0.003***	0.003***
Retrospective scale social change slope			0.001**	0.001**
Community service			0.005**	0.005**
Practicum, internship, field experience slope			0.007***	0.007***
Living-learning program slope			0.005**	0.005**
Culminating senior experience slope			0.012***	0.012***
Social change behaviors scale slope			0.003***	0.003***
Involved member in college org slope			0.001***	0.001***
Leadership role in college org slope			0.001***	0.001***
Leader in off-campus org slope			0.001*	0.001*
Leadership experiences slope			0.006***	0.006***
Variance among participants (σ^2)	0.999	0.992	0.530	0.529
Intra-class correlation coefficient	1.4%	1.3%	1.5%	1.5%
% residual τ_{00}explained				42.9%
% total variance explained	-	0.7%	46.3%	46.9%

*p<.05, **p<.01, ***p<.001

Random effects. The student- and institution-level model explained 46.9 percent of the variance in standardized leadership capacity scores. This total can be divided into 46.3 percent of the between-person variance at level-1 and 42.9 percent of the residual variation among institutions. As indicated by the small initial ICC (1.4 percent), most of the variance in SRLS scores is found among participants, at level-1, and in keeping with the scope of this question, there was no attempt to explain variance in level-1 slopes of variables unrelated to working. Therefore significant variation remains in leadership capacity scores, primarily among participants, that warrants further modeling with level-1 and level-2 covariates.

Furthermore, the inclusion of level-2 variables did not explain any additional variation in the relationship between leadership capacity and working off-campus (τ_{20}); in other words the unconditional and conditional variance components for both slopes were identical. By contrast, institutional variables explained 12.5 percent of the conditional variance in the relationship between working on-campus in administrative departments (τ_{380}) and leadership capacity.

Model D: Leadership self-efficacy and all work variables. The final model explored associations between work status, specific locations, and hours worked, and standardized self-efficacy for leadership, which was the dependent variable. The model specifications are shown below.

Level-1 model.

$$ZOUTEFF_{ij} = \beta_{0j} + \beta_{1j}*(TOTAL\_HR_{ij}) + \beta_{2j}*(WK\_OFF_{ij}) + \beta_{3j}*(WK\_BOTH_{ij}) + \beta_{4j}*(MALE_{ij}) + \beta_{5j}*(TRANS_{ij}) + \beta_{6j}*(AF\_AM_{ij}) + \beta_{7j}*(AS\_AM_{ij}) + \beta_{8j}*(LATINX_{ij}) + \beta_{9j}*(MULTIRAC_{ij}) + \beta_{10j}*(RACE\_OTH_{ij}) + \beta_{11j}*(DISABILI_{ij}) + \beta_{12j}*(INTL_{ij}) + \beta_{13j}*(FIRST\_YR_{ij}) + \beta_{14j}*(SOPHOMOR_{ij}) + \beta_{15j}*(JUNIOR_{ij}) + \beta_{16j}*(INC\_25\_5_{ij}) + \beta_{17j}*(INC\_55\_1_{ij}) + \beta_{18j}*(INC\_ABV_{ij}) + \beta_{19j}*(INC\_NR_{ij}) + \beta_{20j}*(GPA_{ij}) + \beta_{21j}*(PRESRLS_{ij}) + \beta_{22j}*(PREEFF_{ij}) + \beta_{23j}*(PRE3C_{ij}) + \beta_{24j}*(PRE4D_{ij}) + \beta_{25j}*(PRE4G_{ij}) + \beta_{26j}*(ENV3_{ij}) + \beta_{27j}*(ENV4B_{ij}) + \beta_{28j}*(ENV4D_{ij}) + \beta_{29j}*(OUTSCB_{ij}) + \beta_{30j}*(ENV6A_{ij}) + \beta_{31j}*(ENV6B_{ij}) + \beta_{32j}*(ENV7J_{ij}) + \beta_{33j}*(SOCCUL_{ij}) + \beta_{34j}*(ENV10_{ij}) + \beta_{35j}*(ENV10A3_{ij}) + \beta_{36j}*(ACADEMIC_{ij}) + \beta_{37j}*(ACAD\_SPT_{ij}) + \beta_{38j}*(ADM\_FINA_{ij}) + \beta_{39j}*(ADMIN_{ij}) + \beta_{40j}*(ALUM\_DEV_{ij}) + \beta_{41j}*(ATH\_REC_{ij}) + \beta_{42j}*(AUX_{ij}) + \beta_{43j}*(FOOD_{ij}) + \beta_{44j}*(IT\_TECH_{ij}) + \beta_{45j}*(LIBRARY_{ij}) + \beta_{46j}*(PUB\_SFTY_{ij}) + \beta_{47j}*(RES\_LIFE_{ij}) + \beta_{48j}*(SPRT\_LIF_{ij}) + \beta_{49j}*(STU\_AFF_{ij}) + r_{ij}$$

Level-2 model.

$$\beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}*(ALL\_RESE_j) + \gamma_{12}*(MASTERS_j) + \gamma_{13}*(SIZE\_BEL_j) + \gamma_{14}*(SIZE\_5K_j) + \gamma_{15}*(SIZE\_10K_j) + \gamma_{16}*(PRIVATE_j) + \gamma_{17}*(UNCLASSI_j) + \gamma_{18}*(COMPETIT_j) + \gamma_{19}*(VHM\_COMP_j) + \gamma_{110}*(SUBURB_j) + \gamma_{111}*(TOWN_j) + u_{1j}$$
$$\beta_{2j} = \gamma_{20} + \gamma_{21}*(ALL\_RESE_j) + \gamma_{22}*(MASTERS_j) + \gamma_{23}*(SIZE\_BEL_j) + \gamma_{24}*(SIZE\_5K_j) + \gamma_{25}*(SIZE\_10K_j) + \gamma_{26}*(PRIVATE_j) + \gamma_{27}*(UNCLASSI_j) + \gamma_{28}*(COMPETIT_j) + \gamma_{29}*(VHM\_COMP_j) + \gamma_{210}*(SUBURB_j) + \gamma_{211}*(TOWN_j) + u_{2j}$$
$$\beta_{3j} = \gamma_{30}$$
$$\beta_{4j} = \gamma_{40} + u_{4j}$$
$$\beta_{5j} \rightarrow \beta_{6j} = \gamma_{50} \rightarrow \gamma_{60}$$
$$\beta_{7j} = \gamma_{70} + u_{7j}$$
$$\beta_{8j} \rightarrow \beta_{10j} = \gamma_{80} \rightarrow \gamma_{100}$$

$$\beta_{11j} = \gamma_{110} + u_{11j}$$
$$\beta_{12j} \rightarrow \beta_{14j} = \gamma_{120} \rightarrow \gamma_{140}$$
$$\beta_{15j} = \gamma_{150} + u_{15j}$$
$$\beta_{16j} \rightarrow \beta_{19j} = \gamma_{160} \rightarrow \gamma_{190}$$
$$\beta_{20j} = \gamma_{200} + u_{20j}$$
$$\beta_{21j} = \gamma_{210} + u_{21j}$$
$$\beta_{22j} = \gamma_{220} + u_{22j}$$
$$\beta_{23j} = \gamma_{230} + u_{23j}$$
$$\beta_{24j} = \gamma_{240}$$
$$\beta_{25j} = \gamma_{250} + u_{25j}$$
$$\beta_{26j} \rightarrow \beta_{27j} = \gamma_{260} \rightarrow \gamma_{270}$$
$$\beta_{28j} = \gamma_{280} + u_{28j}$$
$$\beta_{29j} = \gamma_{290}$$
$$\beta_{30j} = \gamma_{300} + u_{30j}$$
$$\beta_{31j} \rightarrow \beta_{49j} = \gamma_{310} \rightarrow \gamma_{490}$$

Reliability estimates for predicting the intercept and any randomly varying slope ranged from 0.20 to 0.79. Table 4.11 displays fixed effects and cross-level interactions, while Table 4.12 displays the random effects.

Fixed effects. Model D improves upon Model B by disaggregating work on-campus into 14 specific departments, while still controlling for demographic, retrospective, and environmental covariates, and produces several interesting findings. First, it suggests that the positive association for on-campus work found in Model B is likely due to the influence of four specific workplace locations: admissions and financial aid; athletics, recreation, and wellness programs; IT and technical services; and residence life; the remaining 10 departments are non-significant predictors. Second, these four departments have a varying, though uniformly and significantly positive, relationship with self-efficacy for leadership. At the low end, participants working in athletics, recreation, and wellness or residence life departments are predicted to report leadership self-efficacy scores that are 0.07 standard deviations above the grand mean. At the high end, participants working in admissions or financial aid departments are predicted to self-report scores that are 0.14 standard deviations above the grand mean. Third, Model D

Table 4.11. Model D: Relationships between all work variables and standardized self-efficacy for leadership: Fixed effects and cross-level interactions.

	Model 1 Work variables only		Model 2 Student-level		Model 3 Student- and Institution-Level	
	Coeff	(SE)	Coeff	(SE)	Coeff	(SE)
Intercept	0.06***	(0.02)	0.00	(0.01)	0.00	(0.01)
Total hours per week^						
Intercept2	0.01***	(0.00)	0.00*	(0.00)	0.00**	(0.00)
Carnegie all research					-0.00	(0.00)
Carnegie master's					-0.00	(0.00)
Size below 5,000					-0.00	(0.00)
Size 5,000-10,000					-0.00	(0.00)
Size 10,000 and above					0.00	(0.00)
Private control					-0.00**	(0.00)
Selectivity unclassified					-0.00	(0.00)
Selectivity competitive					0.00***	(0.00)
Selectivity very, highly, most competitive					0.00***	(0.00)
Location suburb					-0.00	(0.00)
Location town					-0.00	(0.00)
Working off-campus^						
Intercept2	0.02	(0.02)	0.05**	(0.02)	0.05*	(0.02)
Carnegie all research					-0.09	(0.07)
Carnegie master's					-0.14*	(0.06)
Size below 5,000					0.07	(0.08)
Size 5,000-10,000					0.15**	(0.05)
Size 10,000 and above					0.05	(0.05)
Private control					0.02	(0.04)
Selectivity unclassified					-0.14	(0.10)
Selectivity competitive					-0.03	(0.08)
Selectivity very, highly, most competitive					-0.08	(0.07)
Location suburb					-0.03	(0.03)
Location town					-0.13**	(0.05)
Working both on- and off-campus	0.11***	(0.03)	0.02	(0.02)	0.02	(0.02)
On-campus work: Academics	-0.06*	(0.03)	-0.01	(0.02)	-0.01	(0.02)
On-campus work: Academic Support			0.04	(0.03)	0.04	(0.03)
On-campus work: Admissions, Financial Aid	0.28***	(0.05)	0.13***	(0.03)	0.14***	(0.03)
On-campus work: Administration			0.03	(0.02)	0.03	(0.03)
On-campus work: Alumni, Development			0.06	(0.04)	0.06	(0.04)
On-campus work: Athletics, Rec, Wellness	0.10**	(0.04)	0.07*	(0.03)	0.07*	(0.03)
On-campus work: Auxiliary Services			0.02	(0.05)	0.01	(0.05)
On-campus work: Food Services	-0.16***	(0.04)	-0.00	(0.03)	-0.00	(0.03)
On-campus work: IT and Technical Services			0.11**	(0.04)	0.11**	(0.04)
On-campus work: Library	-0.16***	(0.05)	-0.03	(0.04)	-0.03	(0.04)
On-campus work: Public Safety			0.04	(0.09)	0.04	(0.09)
On-campus work: Residence Life	0.23***	(0.04)	0.07**	(0.03)	0.07**	(0.03)
On-campus work: Spiritual Life			0.00	(0.07)	0.02	(0.07)
On-campus work: Student Affairs	0.09*	(0.04)	0.02	(0.02)	0.03	(0.02)
Male^			0.07***	(0.01)	0.07***	(0.01)
Transgender			-0.16*	(0.08)	-0.16*	(0.08)
Black/African-American			-0.02	(0.02)	-0.02	(0.02)
Asian/Asian-American^			-0.15***	(0.02)	-0.15***	(0.02)
Latinx			-0.03	(0.03)	-0.03	(0.03)
Multiracial			-0.01	(0.02)	-0.01	(0.02)
All other races			-0.14***	(0.03)	-0.14***	(0.03)

Table 4.11 continued. Model D: Relationships between all work variables and standardized self-efficacy for leadership: Fixed effects

	Model 1 Work variables only	Model 2 Student-level		Model 3 Student- and Institution-Level	
Self-reported disability^		-0.11***	(0.02)	-0.11***	(0.02)
International student		-0.13***	(0.03)	-0.13***	(0.03)
First-year student		-0.17***	(0.02)	-0.16***	(0.02)
Sophomore		-0.19***	(0.01)	-0.18***	(0.01)
Junior^		-0.10***	(0.01)	-0.10***	(0.01)
Parents' income between $25,000-$55,000		0.01	(0.03)	0.01	(0.03)
Parents' income between $55,000-$100,000		0.03	(0.02)	0.03	(0.02)
Parents' income above $100,000		0.05*	(0.02)	0.05*	(0.02)
Parents' income not reported		0.00	(0.02)	0.00	(0.02)
Retrospective scale: Leadership capacity^		0.03***	(0.00)	0.03***	(0.00)
Retrospective scale: Leadership self-efficacy^		0.52***	(0.01)	0.52***	(0.01)
Retrospective scale HS leadership slope^		0.05***	(0.01)	0.05***	(0.01)
Retrospective scale: Comm orgs leadership		0.01*	(0.01)	0.01*	(0.01)
Retrospective scale: Leadership training^		0.02***	(0.01)	0.02***	(0.01)
Community Service		0.04***	(0.01)	0.04***	(0.01)
GPA^		-0.03***	(0.01)	-0.03***	(0.01)
Practicum, internship, field experience		0.04***	(0.01)	0.04***	(0.01)
Living-learning program^		-0.05**	(0.01)	-0.05**	(0.01)
Social change behaviors scale		0.08***	(0.01)	0.08***	(0.01)
Involved member in college organizations^		0.04***	(0.01)	0.05***	(0.01)
Leadership role in college organizations		0.05***	(0.00)	0.05***	(0.00)
Resident Assistant		0.05**	(0.02)	0.05**	(0.02)
Socio-cultural conversations scale		0.14***	(0.01)	0.14***	(0.01)
Leadership experiences		0.08***	(0.01)	0.08***	(0.01)
Leadership certificate program		0.03*	(0.02)	0.03*	(0.02)
Deviance (# parameters)	98620.71 (20)	80741.78 (156)		80700.34 (178)	

*p<.05, **p<.01, ***p<.001
^ denotes randomly varying slopes in models 2 and 3

restates the finding from Model B that off-campus work is associated with leadership self-efficacy scores that are slightly above the grand mean (γ_{20}=0.05). Fourth, Model D departs from Model B in that working both on- and off-campus is no longer a significant predictor of standardized leadership capacity scores. Finally, total hours worked per week is a statistically significant predictor of self-efficacy, however the size of the main effect (γ_{10}=0.003) is practically insignificant. More broadly, as in Model B, most beta coefficients are small enough to suggest relationships are practically non-significant.

Cross-level interactions. Just two slopes among the seventeen work variables—total hours per week and working off-campus—passed the three-part test described above and were allowed to vary randomly. Similar to Model B, three institutional variables were significant predictors ($p<.05$) of the Level-1 slope for working off-campus, and two of these three were associated with a negative increment to the slope for working off-campus that invalidated the slight increase in scores across all students who work-off-campus. Specifically, as compared with students at Carnegie baccalaureate institutions, participants at Carnegie master's institutions are associated with a decrease in the slope for working off-campus (γ_{22}= -0.14) and therefore overall self-efficacy scores that are below the grand mean. A similar result was found for students attending colleges in towns (γ_{210}= -0.13) as compared with cities. Identical to Model B, the one positive increment to the working off-campus slope was associated with students attending institutions with enrollments between 5,000 and 10,000 (γ_{24}=0.15), as compared with much larger universities (enrollment above 20,000).

Three institutional covariates—private control, and two selectivity dummy variables—were found to have a significant effect on the slope for total hours, however the parameter estimates—like the main effect for total hours worked—were practically non-significant. As in prior models, the Carnegie, institutional size, institutional control, institutional selectivity, and location covariates were included in order to keep the model consistent across both randomly-varying slopes. An additional model was run with the slope for total hours fixed and all covariates removed, and deviance scores were compared against Model D using a chi-square test; the results suggested that Model D was significantly better.

Random effects. The student- and institution-level model explained 41.5 percent of the total variance in standardized self-efficacy scores. This total can be divided into 40.6 percent of

the between-person variance at level-1 and 60 percent of the residual variation among institutions. As indicated by the small initial ICC (1.5 percent), most of the variance in SRLS scores is found among participants, at level-1, and in keeping with the scope of this question, there was no attempt to explain variance in level-1 slopes of variables unrelated to working. Therefore significant variation remains in leadership self-efficacy scores, primarily among participants, that warrants further modeling with level-1 and level-2 covariates.

Furthermore, the inclusion of level-2 variables did not explain any additional variation in the relationship between leadership self-efficacy and total hours worked per week (τ_{10}); in other words the unconditional and conditional variance components for both slopes were identical. By contrast, institutional variables explained 42.9 percent of the conditional variance in the relationship between working off-campus (τ_{20}) and leadership self-efficacy.

Table 4.12. Model D: Relationships between all work variables and standardized self-efficacy for leadership: Random effects

Random effect variance component	*Unconditional Model*	*Model 1 Work variables only*	*Model 2 Student -level*	*Model 3 Student- and Institution-Level*
Variance among colleges (τ_{00})	0.015***	0.016***	0.006***	0.006***
Total Hours slope (τ_{10})			0.000**	0.000*
Working off-campus slope (τ_{20})			0.007*	0.004*
Male slope			0.004**	0.004**
Asian-American slope			0.009**	0.008**
Disabilities slope			0.011***	0.010***
Junior slope			0.004**	0.004**
Retrospective scale leadership capacity slope			0.000***	0.000***
Retrospective scale leadership efficacy slope			0.005***	0.005***
Retrospective scale HS leadership slope			0.001**	0.001**
Retrospective scale leadership training slope			0.001**	0.001**
GPA slope			0.001***	0.001***
Living-learning program slope			0.007***	0.007***
Involved member in college org slope			0.001***	0.001***
Variance among participants (σ^2)	0.962	0.947	0.565	0.564
Intra-class correlation coefficient	1.5%	1.7%	1.1%	1.1%
% residual τ_{00}explained				60%
% total variance explained	-	1.6%	40.6%	41.5%

*p<.05, **p<.01, ***p<.001

Summary

Four multilevel models were constructed to examine the relationship between work variables and two dependent variables—leadership capacity and leadership self-efficacy. Results suggest that working status (on-campus, off-campus, or in both locations) is associated with lower self-reported capacity for socially responsible leadership, with scores predicted between 0.15 and 0.18 standard deviations below the mean. When on-campus work is disaggregated into 14 specific workplace locations, each of which is significantly associated with leadership capacity, scores are predicted to decrease 0.13 to 0.27 standard deviations below the mean. In both models, attendance at more selective institutions, as well as those labeled unclassified, predicts a steeper drop in self-reported leadership capacity.

Results also suggest that working status has a positive and statistically significant association with leadership self-efficacy, although the parameter estimates are quite small, suggesting a practically non-significant increase of 0.06 and 0.09 standard deviations above the mean. Those scores are predicted to increase more substantially for students attending mid-size institutions (between 5,000 and 10,000 students), and predicted to drop below the grand mean for all students among students at Carnegie master's level institutions and those attending institutions located in towns as opposed to cities. When on-campus work is disaggregated into 14 specific workplace locations, just four—admissions and financial aid; athletics, recreation, and wellness; IT and technical services; and residence life— are significantly associated with leadership self-efficacy, and scores are predicted to increase 0.07 to 0.14 standard deviations above the mean.

Research Question 3

The third research question states: Among a national sample of college students, is work status associated with variation in how students conceptualize leadership? Using text mining analytic methods, this question will be addressed in two parts: first, an investigation of how all students in this sample think about leadership, and second, an examination of variation in usage of specific words or phrases by working status.

The methodological framework for text mining in this study is the Cross Industry Standard Process for Data Mining (CRISP-DM), as described by Miner et al. (2012) and discussed extensively in chapter three. The CRISP-DM depicts data collection and analysis in three phases: establishing a corpus, or collection of documents; preprocessing the data; and extracting the results. Results from this study will follow that framework. In sum, the results suggest that students in this sample conceptualize leadership more typically as consonant with industrial themes. When disaggregated by working status, the only appreciable difference in conceptualization of leadership suggests that students who work off-campus more frequently employ language from the post-industrial paradigm.

Industrial Themes

A plurality of topics (n=28) presented themes consonant with the industrial paradigm of leadership. (See Table 4.13.) As described in chapter two, the industrial paradigm (Rost, 1991) equates leadership with good management, hierarchical authority, productivity, and goal orientation. Historical theories that have been grouped together in the industrial paradigm emphasize that leaders possess positive traits or enact certain behaviors that make them more effective at attaining desired goals, or respond nimbly to varying situations in order to produce successful outcomes. Most topics stood in opposition to precepts of the SCM and were labeled in

Table 4.13 as antithetical to the model. Others communicated ideas largely outside the scope of the SCM, and were labeled as peripheral.

Leaders guide and direct others. This theme includes topics that equate leadership with effective management. The first topic, which carried the highest eigenvalue among the whole group, speaks to this theme using some combination of the words *guides*, *leads*, *person*, *helps*, and *takes*. Among the nearly 6,000 participants whose remarks grouped together here, a theme emerged that leadership resides in one person who guides or directs a group benevolently toward a goal. Many participants provided a definition of leadership that was broadly similar to "a person who guides or directs a group" (case 14001). One participant highlighted what they saw as a leader's capacity to unify, as someone "who takes the chaos of individuals and makes them into a team" (case 60804). Participants in topic 1 grappled with the definitional problem of leadership described in chapter two, often using the self-referential word *leads* to describe what leaders do. Echoes of this theme surface in other topics as well, where participants use words like

Table 4.13. Results of Principal Components Analysis: Industrial paradigm

No.	Keywords	Eigen.	No. Cases	% Cases	Relationship to SCM	Sample response to prompt: "Please provide a brief definition of what the term *leadership* means to you."
1	Guides; Leads; Person; Helps; Takes	5.02	5,985	7.72	Antithetical	Leadership is when a PERSON TAKES a higher role among the rest of the members of a group and, to an extent, GUIDES and directs their goals/actions. (Case 65307)
2	Bring; Goal; People	2.28	27,423	35.38	Central	To work or BRING together a group of PEOPLE for a common GOAL or purpose (Case 67296)
4	Role; Model	1.81	3,303	4.26	Peripheral	Being a positive ROLE MODEL for others (Case 56574)
5	Decision(s); Make; Making; Tough	1.72	6,126	7.90	Antithetical	Someone who is willing to MAKE the TOUGH DECISIONS & then lead others to the end, no matter what the cost. (Case 38113)
6	Charge; Control; Situation; Taking	1.69	10,622	13.71	Antithetical	Leadership means TAKING CONTROL of a certain SITUATION and certain people and being responsible for everything that is done from that point forward and being in CHARGE of other people's work. Leading the pack. (Case 36070)
11	Influencing; Mission; Motivation; Providing; Purpose	1.54	3,169	4.09	Antithetical	Leadership is the art and science of influencing, directing, and motivating people to accomplish a mission. (Case 47916)
13	Open; Minded	1.51	831	1.07	Peripheral	Being OPEN MINDED and understanding while adapting to different situations and people. (Case 52221)
14	Encouraging; Guiding; Motivating; Organizing; Directing	1.46	5,473	7.06	Peripheral	Taking responsibility for ORGANIZING, MOTIVATING, and ENCOURAGING people to work towards a common goal. (Case 27321)
17	Efficient; Effective; Manner; Productive	1.41	2,184	2.82	Peripheral	Leadership is the ability and responsibility to help others work towards a common goal in a PRODUCTIVE, EFFICIENT, and positive MANNER. (Case 18831)
18	Courage; Integrity; Service; Strength	1.41	1,642	2.12	Peripheral	Loyalty, Duty, Responsibility, Selfless SERVICE, Honesty, INTEGRITY, Personal COURAGE (Case 56987)
19	Complete; Task; Hand	1.40	3,039	3.92	Antithetical	Leadership is the ability to bring people together for a common cause and organize them to COMPLETE the TASK at HAND. (Case 17265)
22	Setting; Follow	1.34	4,793	6.19	Peripheral	Leadership is SETTING a positive example for others to FOLLOW (Case 16075)
25	Achieve; Goals; Set	1.31	8,047	10.38	Antithetical	The ability to effectively command a group to ACHIEVE a SET of GOALS. (Case 23955)
28	Advice; Direction; Guidance; Providing; Support	1.28	6,545	8.44	Peripheral	Leadership is PROVIDING GUIDANCE, ADVICE, and DIRECTION to a group of people to achieve a common goal (Case 31422)
30	Gain; Respect; Trust	1.26	2,198	2.83	Peripheral	Leadership is the ability to GAIN the RESPECT and TRUST of your peers in exchange for their commitment and dedication to following out the same goal. (Case 59617)

Table 4.13 continued. Results of Principal Components Analysis: Industrial paradigm

No.	Keywords	Eigen.	No. Cases	% Cases	Relationship to SCM	Sample response to prompt: "Please provide a brief definition of what the term *leadership* means to you."
31	Communicate; Effectively; Efficiently	1.25	3,223	4.16	Peripheral	Leadership means EFFECTIVELY and EFFICIENTLY being able to coordinate and COMMUNICATE both with those below and above you in terms of organization level with respect and fair-treatment in accordance with organizational goals. (Case 42584)
34	Delegate; Responsibilities; Tasks	1.23	1,589	2.05	Antithetical	Being able to DELEGATE RESPONSIBILITIES to other people with enough confidence for them to listen. (Case 36236)
35	Desired; Outcome	1.22	624	0.81	Antithetical	Always making sure the DESIRED goal/OUTCOME is a success, no matter what the challenge may be. (Case 21517)
39	Ability; Encourage; Inspire; Motivate	1.20	13,563	17.50	Peripheral	ABILITY to MOTIVATE, support, and ENCOURAGE others to work towards a common goal (Case 40917)
40	Accountable; Hold	1.18	431	0.56	Peripheral	Leadership is assuming a position in which you set goals for yourself and your community and you HOLD each member and yourself ACCOUNTABLE in achieving those goals. (Case 26672)
41	Guide; Path; Success	1.18	7,058	9.11	Antithetical	Leadership is the ability to GUIDE others to a PATH of SUCCESS and greatness. (Case 62738)
43	Power; Necessarily; Simply	1.17	984	1.27	Antithetical	Leadership is SIMPLY, the POWER to influence others to follow (Case 73138)
44	Communication; Skills	1.16	1,508	1.95	Peripheral	Leadership means using effective COMMUNICATION SKILLS to guide others toward a common positive goal. (Case 17624)
48	Abilities; Talents	1.15	713	0.92	Peripheral	Using one's TALENTS and ABILITIES to encourage and inspire others (Case 31166)
49	Experience; Knowledge	1.14	921	1.19	Peripheral	Using one's KNOWLEDGE, wisdom, EXPERIENCE, expertise, and confidence to guide others, as well as work alongside others, to reach a common goal. (Case 66481)
54	Guide	1.13	5,314	6.86	Antithetical	Ability to GUIDE others. (Case 14766)
56	Accomplished; Decision; Force	1.12	1,106	1.43	Antithetical	Acting as the primary FORCE in a group working to achieve a goal. It requires DECISION making, delegation, drive and organization. (Case 25584)
57	Looked; Respected	1.12	522	0.67	Antithetical	Getting others to do what you want while being RESPECTED and LOOKED up to. (Case 23268)
58	Coordinate; Efforts	1.11	410	0.53	Peripheral	Leadership means the ability to see a need for change in the world, come up with a feasible plan to enact that change (taking into account the contributions and viewpoints of others), and COORDINATE the EFFORTS of a group to effect that change. (Case 43636)
59	Inspiring; Vision; Future	1.11	1,980	2.56	Antithetical	INSPIRING others to follow your VISION (Case 22390)

"guide" (topic 54, case 14766) to describe individuals who "provide support and direction" (topic 28, case 2835) for a group of people on "a path of success and greatness" (topic 41, case 62738) to "accomplish a mission" (topic 11, case 47916).

Leaders assert their power by taking control and delegating tasks. Continuing the refrain of leader-as-manager, participants grouped in topics 6, 34, 43, and 58 described leaders harnessing power and asserting themselves through control and delegation. Some espoused a belief that "leadership is simply, the power to influence others to follow" (topic 43, case 73138) or "the power and ability to make a decision" (topic 43, case 5783). More than 10,000 participants used the words *charge*, *control*, *situation*, or *taking* to define leadership as akin to "taking control of a situation" (topic 6, case 29681) or "being in charge of other people's work. Leading the pack" (topic 6, case 36070). A key power is the freedom to delegate tasks to others, as described by participants in topics 34 and 58. One participant wrote that leaders must be able to "delegate responsibilities to other people with enough confidence for them to listen" (topic 34, case 36236). Another wrote "leadership means not only knowing what is best for the group but being able to coordinate group efforts towards realizing that end" (topic 58, case 45778).

Leaders make decisions. Decision-making is at the heart of this view of leadership, as described by participants who endorsed leaders who make "tough decisions … no matter what the cost" (topic 5, case 38113). One person described the capacity to make decisions with a stereotypically masculine swagger: "being able to organize a body of people, making collective decisions for the greater good of the group as a whole, and having the balls to make tough decisions when called for" (topic 5, case 190). Other participants also spoke to the necessity for leaders to demonstrate "firm decision making" (topic 56, case 36665), an explicit appeal to the use of hard power tactics.

Leaders are goal-oriented. When leadership is equivalent to good management, productivity and goal achievement are the benchmarks for success. Participants spoke to this theme across several topics. Topic 2, which carried the second-highest eigenvalue among all topics and was formed from the largest single grouping of cases (n=27,423, representing more than 35 percent of the sample), uncovered participants using some combination of the words *bring*, *goal*, and *people*. The most common response was largely similar to "being able to bring people together towards a common goal" (topic 2, case 22260). Furthermore, 8,000 participants described leadership, at least in part, as setting and achieving goals (topic 25). Using slightly different language, another group of participants saw leadership as the ability to "complete the task at hand" (topic 19, case 17265). Still another group expressed the same idea using the phrase *desired outcome*; for these students leadership requires "always making sure the desired goal/outcome is a success, no matter what the challenge may be" (topic 35, case 21517). A crucial component in the goal-achievement toolbox is accountability. As one participant wrote, "leadership is assuming a position in which you set goals for yourself and your community and you hold each member and yourself accountable in achieving those goals" (topic 40, case 26672).

Leaders are role models who possess a wealth of skills. An array of participant responses clustered into recognizable and specific skills that they believed leaders demonstrate. For example, some saw leadership in those who are "open minded" (component 13, case 52221), act with "selfless service, honesty, integrity, [and] personal courage" (component 18, case 56987), possess "strong communication skills" (topic 44, case 13584), and offer "an inspiring vision for the future" (component 59, case 70923). When working toward a common goal, leaders are proficient at "organizing … and encouraging people" (topic 14, case 73920), act "in

an effective and efficient manner" (topic 17, case 72767), and have an "ability to motivate, inspire, and bring followers to a higher level" (topic 39, case 67344).

Some participants expressed a belief that these skills attach to specific individuals, as in the early "great man" theories of the industrial paradigm. One wrote that "leadership is using your god given abilities, skills, and talents towards a greater good for all" (topic 48, case 46784). Others seemed to suggest that leader behavior is learned: "leadership means guiding others based off previous experience or knowledge" (topic 49, case 8723).

Among those participants who did not enumerate specific skills, leadership was evident in performance that is worthy of respect and attractive to followers. For instance, leadership involves "being a positive role model" (topic 4, case 56574), "setting a positive example for others to follow" (topic 22, case 16075), "being respected and looked up to" (topic 57, case 23268), or "[gaining] the respect and trust of your peers" (component 30, case 59617).

Relationship to the social change model. The topics that speak to the industrial paradigm are, at best, peripheral, and, at worst, antithetical, to the assumptions and constructs embedded in the social change model (SCM) of leadership development. The SCM is focused on an interactive process rather than positional authority, and the only stated goal of this process is positive social change. These topics emphasize the individual power, organizational hierarchy, and specific abilities or skills that an individual can use to achieve desired goals.

Bridge Themes

A minority of topics (n=8) presents themes that resonate with both industrial and post-industrial paradigms of leadership theory, and conceptually represent a bridge between them. (See Table 4.14.) As described in chapter two, bridge theories are distinctive due to their transformative approach toward followership, imperative for moral action, reliance on individual

Table 4.14. Results of Principal Components Analysis: Topics that bridge industrial and post-industrial paradigms

No.	Keywords	Eigen.	No. Cases	% Cases	Relationship to SCM	Sample response to prompt: "Please provide a brief definition of what the term *leadership* means to you."
8	Full; Potential; Reach	1.63	2,441	3.15	Central	To me, leadership is a very frightening experience of taking on the responsibility to inspire others to REACH their FULL POTENTIAL in every way possible. Though frightening, the process and results can be very internally rewarding, ultimately leading to a stronger sense of self-worth and pride. There is no greater feeling in the world than finding and learning more about yourself through helping others, progressing your personal development, and acting as a catalyst for the development of others. (Case 31074)
10	Problem(s); Solve	1.56	1,137	1.47	Proximal	Leadership is basically being able to SOLVE PROBLEMS and think critically in a group context. (Case 71973)
15	Face; Adversity	1.45	428	0.55	Proximal	The ability to FACE ADVERSITY head on and bring your peers with you (Case 72275)
21	Grow; Learn	1.36	1,069	1.38	Central	Helping others LEARN and GROW by providing direction and support. (Case 14368)
24	Keeping; Interest(s); Mind	1.32	1,297	1.67	Peripheral	Directing others to achieve a common goal while KEEPING the individuals' best INTEREST in MIND. (Case 73568)
29	Feel; Comfortable	1.28	833	1.07	Peripheral	Being able to take control of a situation and lead others in a way that makes everyone FEEL COMFORTABLE and involved. (Case 9529)
32	Afraid; Speak; Voice; Stand; Opinion	1.24	2,098	2.71	Peripheral	[Leadership] means not being AFRAID to SPEAK what you believe, it means standing up for those that don't have a VOICE and it means that you are willing to set an example. (Case 11073)
37	Handle; Difficult; Situations; Times	1.21	1,714	2.21	Proximal	Leadership to me means being able to HANDLE DIFFICULT SITUATIONS under pressure but not letting it get to you. [It] means taking into account the differences in cultures and backgrounds when working with all types of people. (Case 51873)
50	Hard; Times	1.14	1,108	1.43	Proximal	Leadership is guiding fellow peers toward a goal through HARD TIMES or obstacles in an engaging way. (Case 34500)

power, and commitment to specific goals (Burns, 1978; Rost, 1991). Some topics expressed ideas closely related to precepts of the SCM, and were labeled in Table 4.14 as proximal or central to the model.

Leadership involves nurturing and developing others. Across three topics, participants expressed an acute awareness of followers' needs that demonstrated a markedly different conceptualization from those whose responses were aligned with the industrial paradigm. For example, participants described leadership as making everyone in a group "feel comfortable" (topic 29, case 9529), "keeping the individuals' best interest in mind" when directing a group toward a common goal (topic 24, case 73568) and "standing up for those that don't have a voice" (topic 32, case 11073). In two additional topics, participants used language that suggested a belief in a leader's responsibility to not simply nurture or speak on behalf of followers, but help them develop. For example, 2,400 students described leadership as a process of helping "others to reach their full potential" (topic 8, case 31074), while a smaller number saw leaders fostering an environment where people can "learn and grow" (topic 21, case 14368).

Leadership is rooted in problem solving and overcoming adversity. Using language of collaborative problem solving, approximately 4,300 students spoke to one purpose of leadership distinctive from a hierarchical, transactional approach. As one student wrote: "leadership is basically being able to solve problems and think critically in a group context," (topic 10, case 71973). In related topics, others saw leadership as the ability to "handle difficult situations" (topic 37, case 51873), "face adversity head on and bring your peers with you," (topic 15, case 72275), or guide "fellow peers toward a goal through hard times" (topic 50, case 34500).

Relationship to the social change model. There is wide variation in the relationship between these topics and the assumptions and constructs embedded in the SCM. The SCM promotes self-aware individuals working in collaboration and with a common purpose to create change. Three topics (24, 29, and 32) seem peripheral to this model, focusing instead on a more empathic managerial approach. Four topics (10, 15, 37, and 50) seem proximal to the model due to their emphasis on change amid challenging circumstances. Two topics (8 and 21) appear central to the model because they communicate a desire to transform others, and potentially the self as well, through effective leadership.

Post-Industrial Themes

Eighteen topics presented themes consonant with the post-industrial paradigm of leadership. (See Table 4.15.) As described in chapter two, the post-industrial paradigm (Rost, 1991) equates leadership with relational, mutual, non-coercive processes among positional leaders and followers. Contemporary theories that have been grouped together in the post-industrial paradigm emphasize that leadership occurs in dynamic interactions among individuals coming together to solve complex problems. Most of the topics were closely aligned with concepts and notions contained in the SCM, and were labeled in Table 4.15 as central to the model.

The purpose of leadership is to create change. This theme includes topics that equate leadership with creating change. The most straightforward evidence of this theme is captured by the 11,000 participants who wrote something akin to "leadership means creating positive social change" (topic 12, case 60660) or "leadership means working in ways that positively impact and influence those around you" (topic 51, case 23939). A smaller number said something largely similar: "making an effective and positive difference on other peoples' lives" (topic 36, case

Table 4.15. Results of Principal Components Analysis: Post-industrial paradigms

No.	Keywords	Eigen.	No. Cases	% Cases	Relationship to SCM	Sample response to prompt: "Please provide a brief definition of what the term *leadership* means to you."
3	Account; Everyone's; Ideas; Opinions; Thoughts; Consideration	1.94	3,799	4.90	Central	Taking into ACCOUNT EVERYONE'S THOUGHTS and IDEAS and trying to find the best possible solution for the group collectively. (Case 33231)
9	Strengths; Weaknesses	1.60	690	0.89	Central	Bringing out the STRENGTHS in those around you and recognizing your own STRENGTHS and WEAKNESSES (Case 47718)
12	Change; Create; Creating; Environment; Positive	1.51	5,507	7.11	Central	Leadership means CREATING POSITIVE social CHANGE. (Case 60660)
16	Actions; Words	1.42	1,749	2.26	Central	Leadership means empowering others through your WORDS or ACTIONS. (Case 33370)
20	Move; Forward	1.38	752	0.97	Central	Leadership is being able to help others MOVE FORWARD, in turn helping you MOVE FORWARD. (Case 4446)
23	Greater; Good	1.34	4,793	6.19	Proximal	Being able to change your environment for the GREATER GOOD for humanity (Case 63234)
26	Beliefs; Values	1.30	1,977	2.55	Central	Leadership means that my VALUES and BELIEFS are demonstrated in my actions towards helping others achieve their goals. (Case 945)
33	Life; Live; Living	1.23	1,395	1.80	Central	LIVING a LIFE that embodies your values (Case 43511)
36	Difference; People's; Lives	1.21	1,269	1.64	Central	Making an effective and positive DIFFERENCE on other peoples' LIVES. (Case 6142)
42	Followers; Leader(s); True	1.18	6,097	7.87	Central	Leadership does not mean that you have to be the LEADER of a group. I feel there are not two separate categories of people: FOLLOWERS and LEADERS. I feel that throughout our lives we become both FOLLOWERS and LEADERS. (Case 33277)
45	Differences; Perspectives	1.16	450	0.58	Central	Leadership means being able to engage respectfully with all types of different people and PERSPECTIVES and managing to successfully work towards common goals and mutually beneficial outcomes without jeopardizing the value of those DIFFERENCES (Case 63951)
46	Active; Actively; Member	1.16	1,135	1.46	Central	The term leadership means to be an ACTIVE MEMBER of a group that works towards a common goal, that makes sure everyone is heard and guides others, working not for themselves but others. (Case 75012)
51	Impact; Influence; Positive; Positively	1.13	5,592	7.22	Central	To me, leadership means working in ways that POSITIVELY IMPACT and INFLUENCE those around you. (Case 23939)

Table 4.15 continued. Results of Principal Components Analysis: Post-industrial paradigms

No.	Keywords	Eigen.	No. Cases	% Cases	Relationship to SCM	Sample response to prompt: "Please provide a brief definition of what the term *leadership* means to you."
52	Facilitating; Personal; Growth	1.13	1,251	1.61	Central	Leadership is [one's] GROWTH in becoming a better person that can help a group/cause move forward while lifting others to begin their own PERSONAL GROWTH journey. (Case 1991)
53	Caring	1.13	213	0.27	Central	Leading others, doing it without bias, CARING about those you lead and your cause. (Case 31810)
55	Showing; Telling	1.12	966	1.25	Central	SHOWING people how to achieve their goals rather than TELLING them how. (Case 15463)
60	Knowing; Step	1.11	1.495	1.93	Central	KNOWING when to STEP up and STEP back (Case 18450)

6142). Others used euphemistic language to mean substantially the same thing. For instance some participants used the phrase "move forward" (topic 20, case 4446) to denote an abstract process that is progressive in some way. Nearly 5,000 students used the phrase *greater good*, calling to mind civic or religious precepts. One participant wrote that leadership is "being able to change your environment for the greater good for humanity" (topic 23, case 63234). Finally, 1,200 students emphasized that leadership means encouraging and supporting "growth" in self and others through mutual, non-hierarchical engagement (topic 52, case 1991).

Leadership requires engaged give-and-take between leaders and followers. The central message of this theme is that leadership is found among a group of individuals who are actively engaged with one another. Topics emphasized different aspects of an engaged process grounded in mutuality. For example, some emphasized a deep connection among positional leaders and followers. One participant wrote that leadership requires "taking into account everyone's thoughts and ideas and trying to find the best possible solution for the group collectively" (topic 3, case 33231). Still another wrote that "the term leadership means to be an

active member of a group that works towards a common goal, that makes sure everyone is heard and guides others, working not for themselves but others" (topic 46, case 75012). Others focused on specific behaviors a positional leader can employ, but with a post-industrial focus on developing others and the common cause. One participant wrote that leadership is "showing people how to achieve their goals rather than telling them how" (topic 55, case 15463), while another defined leadership as "caring about those you lead and your cause" (topic 53, case 31810). These perspectives illuminate the essence of collaboration.

Some participants opined that leadership does not require a static positional leader, a touchstone of post-industrial theory. One participant wrote: "leadership does not mean that you have to be the leader of a group. I feel there are not two separate categories of people: followers and leaders. I feel that throughout our lives we become both followers and leaders" (topic 42, case 33277). Put another way, leaders know when not to take charge, "when to step up and step back" (topic 60, case 18450).

A small number of respondents reflected on the need to work successfully among a diverse group. One student defined leadership as "being able to engage respectfully with all types of different people and perspectives and managing to successfully work towards common goals and mutually beneficial outcomes without jeopardizing the value of those differences (topic 45, case 63951). Another wrote that leaders are successful at "bringing out the strengths in those around you and recognizing your own strength and weaknesses" (topic 9, case 47718).

Leadership is rooted in individual values and requires congruence with speech and actions. The final post-industrial theme suggests that leadership is an expression of congruence between one's values and behaviors. Expressing this belief were students who wrote something akin to "leadership means that my values and belief are demonstrated in my actions towards

helping others achieve their goals" (topic 26, case 945). Others shared a similar belief by explaining that "leadership means empowering others through your words or actions" (topic 16, case 33370). For others, congruence is evident in "living a life that embodies your values" (topic 33, case 43511).

Relationship to the social change model. These themes are central to the assumptions and constructs embedded in the social change model SCM. The SCM thoroughly develops individual values—consciousness of self, and congruence between values and actions in particular—that are well-represented in language used across the corpus. Likewise, several topics described above—most notably, topic 2, which reflected responses provided by the largest group of participants—communicate an understanding of collaboration and common purpose, two key group values described by the SCM. Finally, a sizable number of participants expressed a belief that leadership exists to promote positive social change—both the hub of the SCM and its goal.

Thematic Analysis: Cluster Analysis

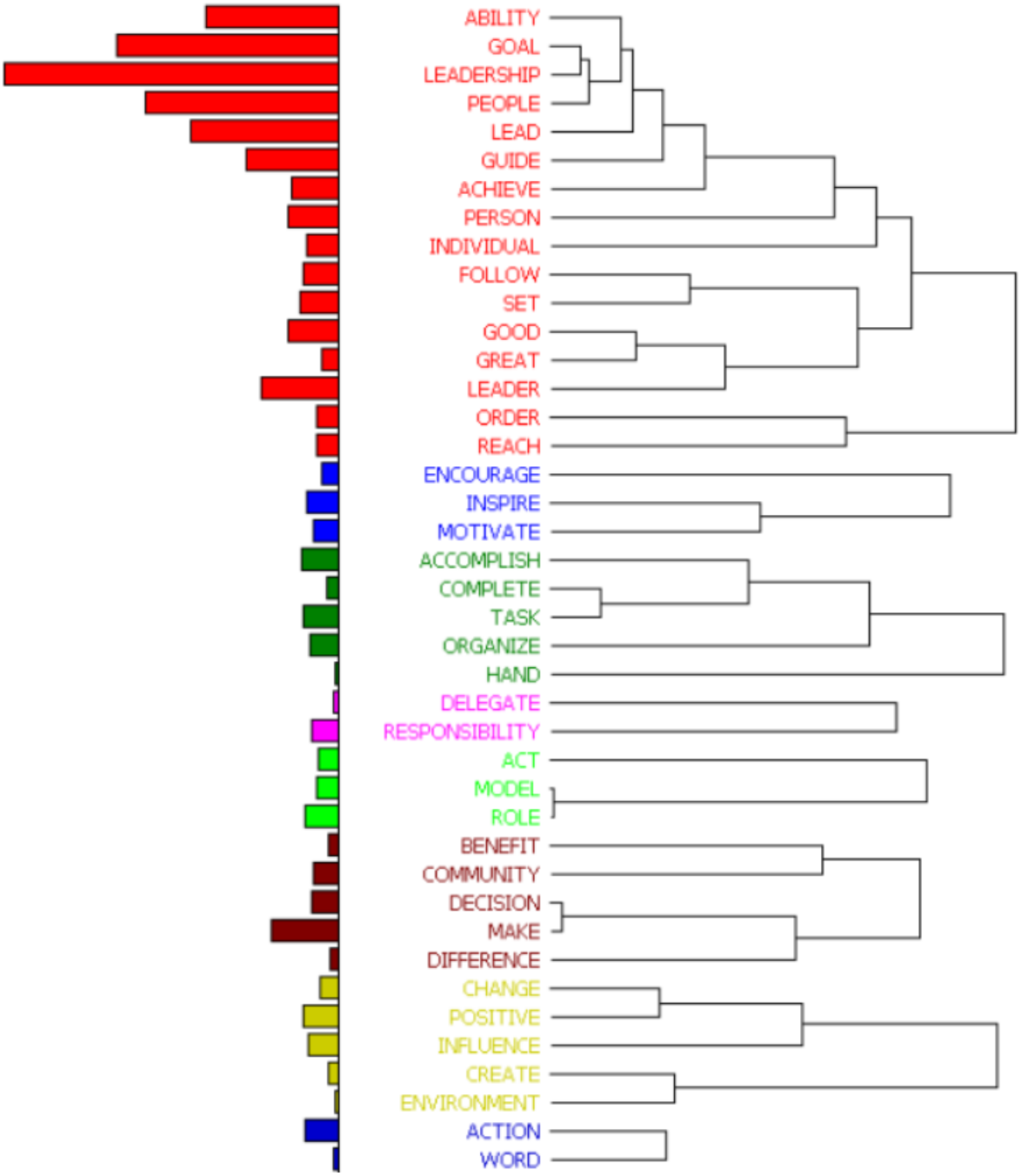
Several methods of cluster analysis were performed to examine co-occurrence patterns among words. Cluster analysis techniques are exploratory more than they are explanatory; through a variety of visual tools they offer another way to understand language use across a large collection of documents, without providing a clear indication of why particular words co-occur. The specific tools used to further examine student conceptualizations of leadership include a dendrogram, or tree graph, in which words that regularly appear together are connected to one another in a hierarchical process of agglomeration; as the process continues, clusters of words join together. A second tool is link analysis, which examines specific clusters of words and maps their relationships along with the relative strength of each association. Association strength is represented by Jaccard's coefficient. According to the WordStat manual, the coefficient is

"computed from a fourfold table as *a/(a+b+c)* where *a* represents cases where both items occur, and *b* and *c* represent cases where one item is found but not the other. In this coefficient equal weight is given to matches and non matches" (Provalis Research, 2015, p. 65). The final cluster analysis tool employed in the present study is the proximity plot, which captures the measured distance between related words.

Dendrogram. After activating the lemmatization dictionary, participant responses were clustered via an agglomeration process and presented in a dendrogram, a portion of which is shown in Figure 4.1. (To maintain readability, the entire dendrogram would need to stretch across multiple pages; the figure excerpted below captures many of the frequently used words listed in Table 3.10.) Examining the top cluster (shown in red), the words *leadership* and *goal* grouped together initially, followed by these words in descending order: *people*, *ability*, *lead*, *guide*, *achieve*, *person*, and *individual*. A separate cluster was formed by the words *follow* and *set*. A third cluster was formed by *good* and *great*, with the subsequent addition of *leader*. The second and third clusters joined together, and then joined the first cluster of words. A fourth cluster, consisting of *order* and *reach* tacked on to the earlier three clusters at the end.

This graph offers limited insight into participant responses. The most useful feature is a confirmation that many of the word clusters echo the principal components extracted and described above. For example, *guide*, *lead*, and *person* cluster together amid the frequently-used words and are also found in topic 1 (industrial paradigm), which explains the most variance in the term-document matrix, as measured by its eigenvalue. This pattern is evident throughout the excerpted portion of the dendrogram. Toward the bottom of the list, words found in topic 12 (post-industrial)—*change*, *positive*, *environment*—are shown in a cluster as well.

Figure 4.1. Dendrogram (tree graph) of word clusters including most frequently used words.



Link Analysis. To extract more meaningful findings, a link analysis is used to examine the strength of association among words within clusters. Four of the word clusters shown in the dendrogram were selected for individual link analysis. Figure 4.2 reproduces a multidimensional network graph of the first cluster in the dendrogram, comprising 16 words from *ability* to *reach*. The Jaccard's coefficient shown on the connecting lines indicates the strength in association between the words and can be interpreted as the proportion of responses that contain both words among all responses in which one word is already present. For example, the words *great* and *good* co-occur in 12.7 percent of responses. The strongest associations connect with the word *leadership*, likely reflecting the fact that it was the most frequently used word, often at the beginning of a participant's response.

A second link analysis was performed beginning with the cluster that contains the words *encourage*, *inspire*, and *motivate*, and is shown below in Figure 4.3. This graph indicates the connections between this distinctive cluster and its larger, 16-word neighbor. For example, *goal* co-occurs equally with *motivate*, *inspire*, and *leader*—approximately 5 percent of the time. By contrast, *encourage* is more isolated, co-occurring only with *motivate*, 4 percent of the time.

A third link analysis was performed beginning with the cluster that contains the words *complete*, *task*, *hand*, *organize*, and *accomplish*, and is shown below in Figure 4.4. This graph indicates the connections among conceptualizations that resonate with industrial theories of leadership, such as task organization, delegation, and completion. For example, *task* co-occurs with *complete* 18 percent of the time. It also suggests that *accomplish* provides a pivot point for two separate words clusters, one of which is dominated by words captured in the first cluster (e.g., *leadership*, *goal*).

Figure 4.2. Link analysis of word cluster including *leadership* and *ability*.

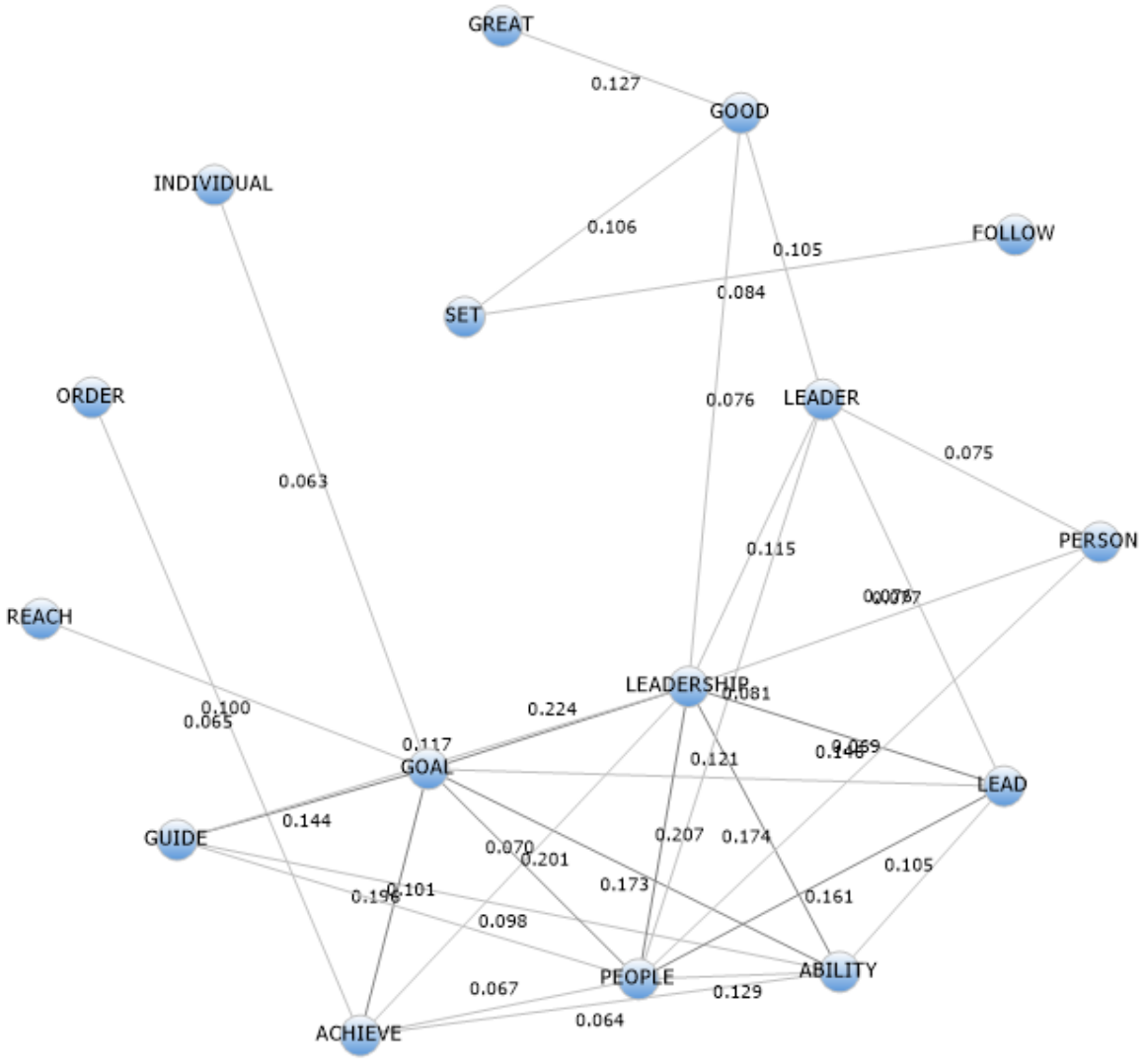


Figure 4.3. Link analysis of word cluster including *encourage* and *inspire*.

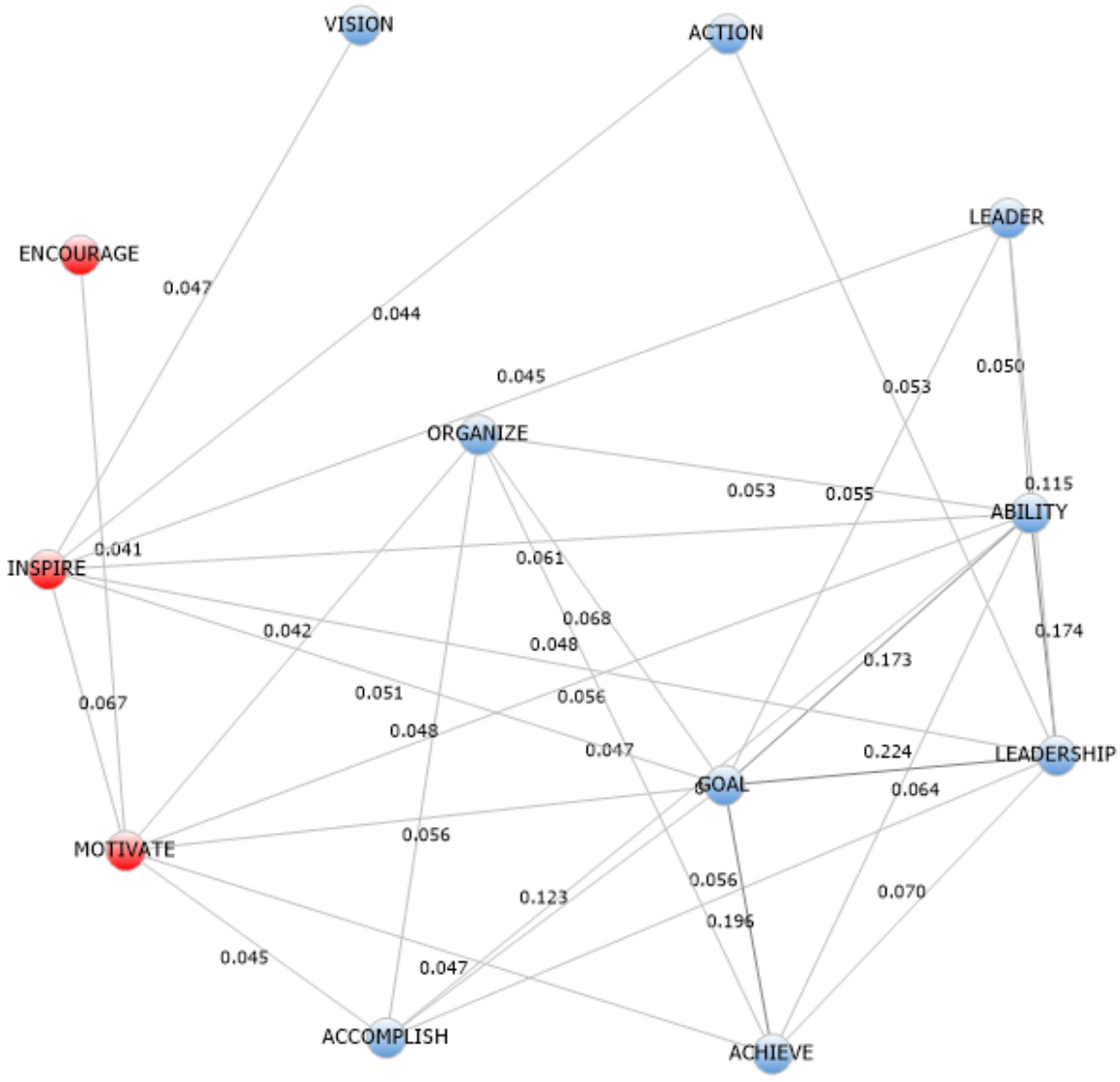


Figure 4.4. Link analysis of word cluster including *accomplish* and *task*.

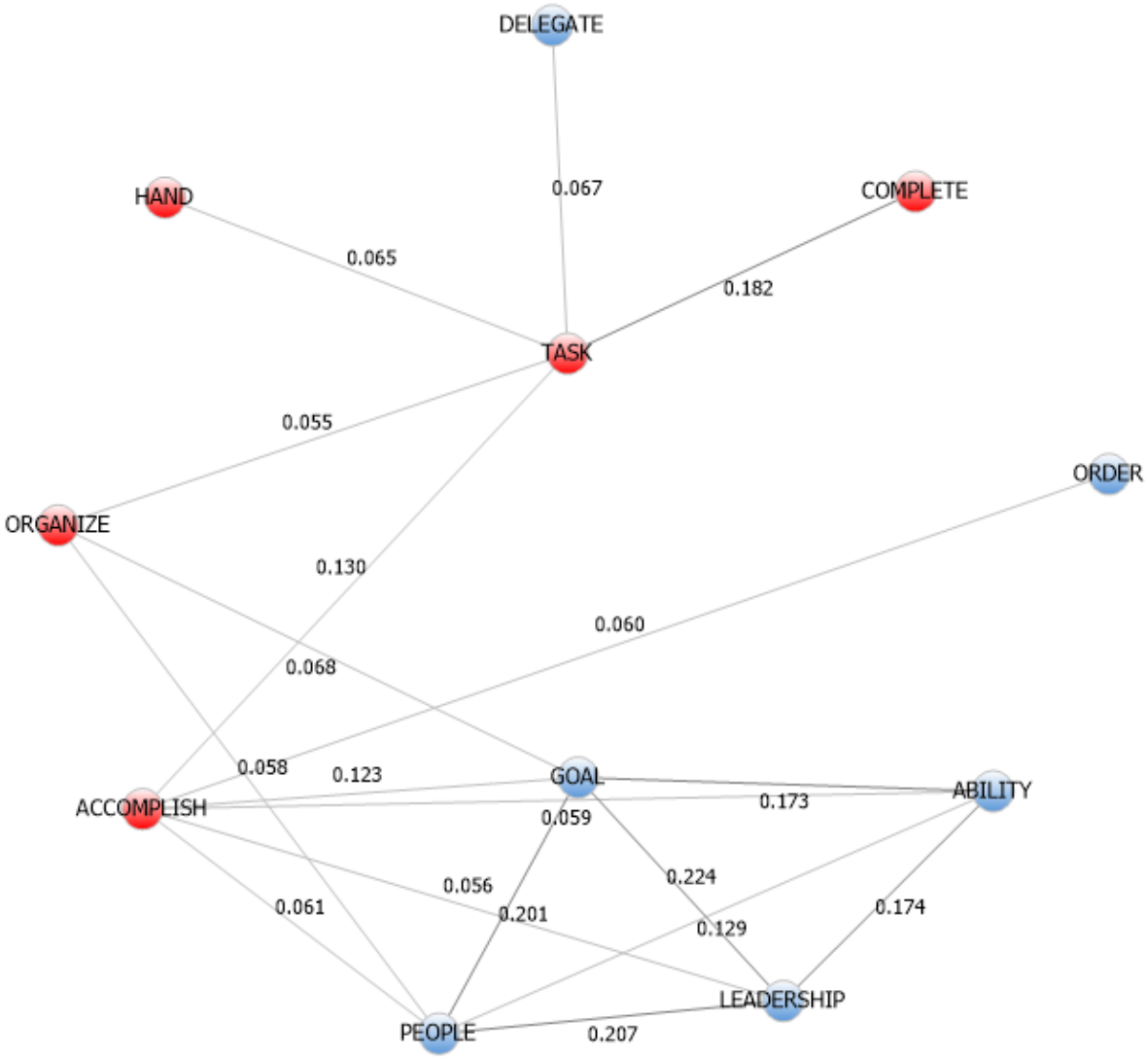
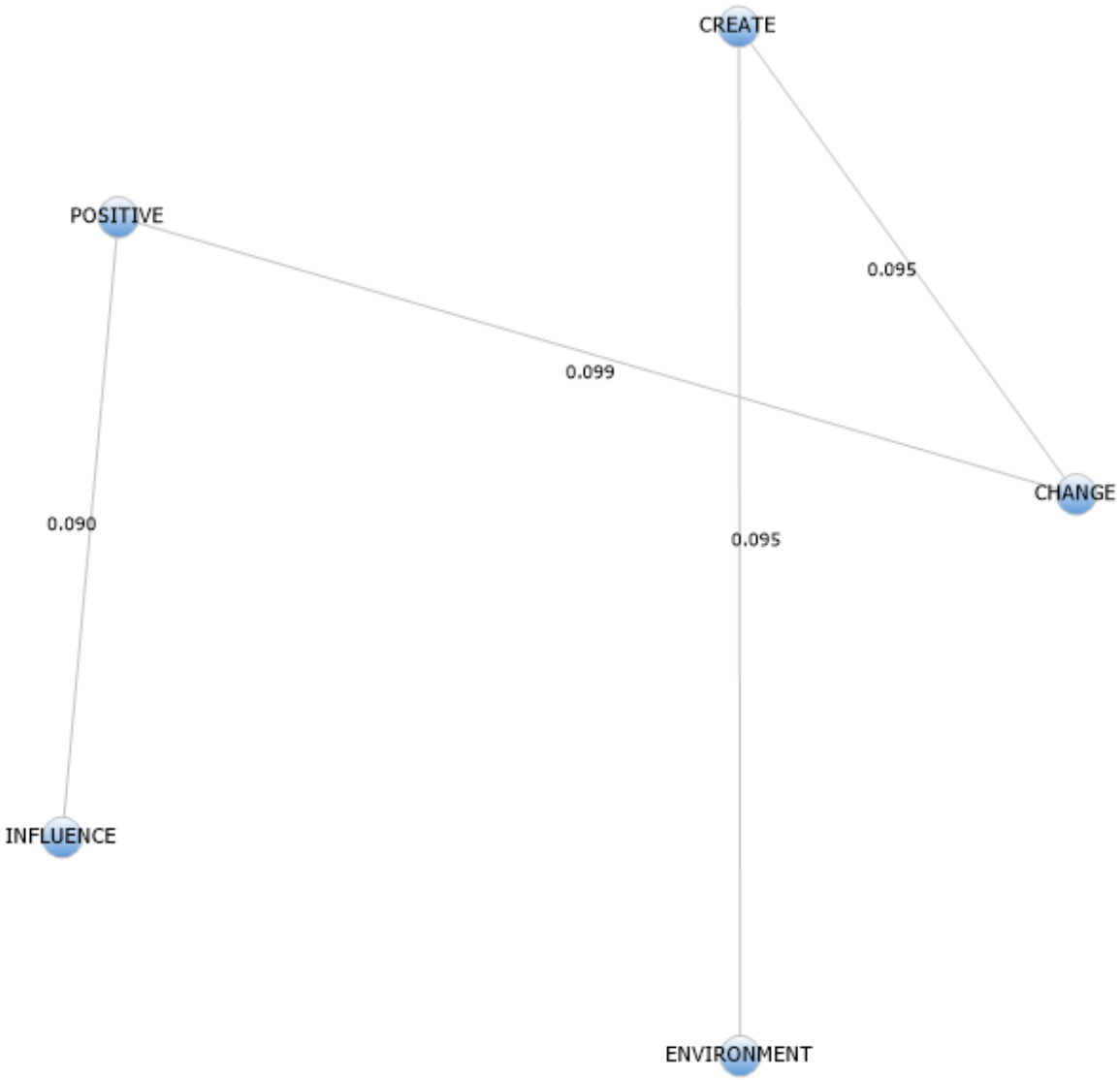


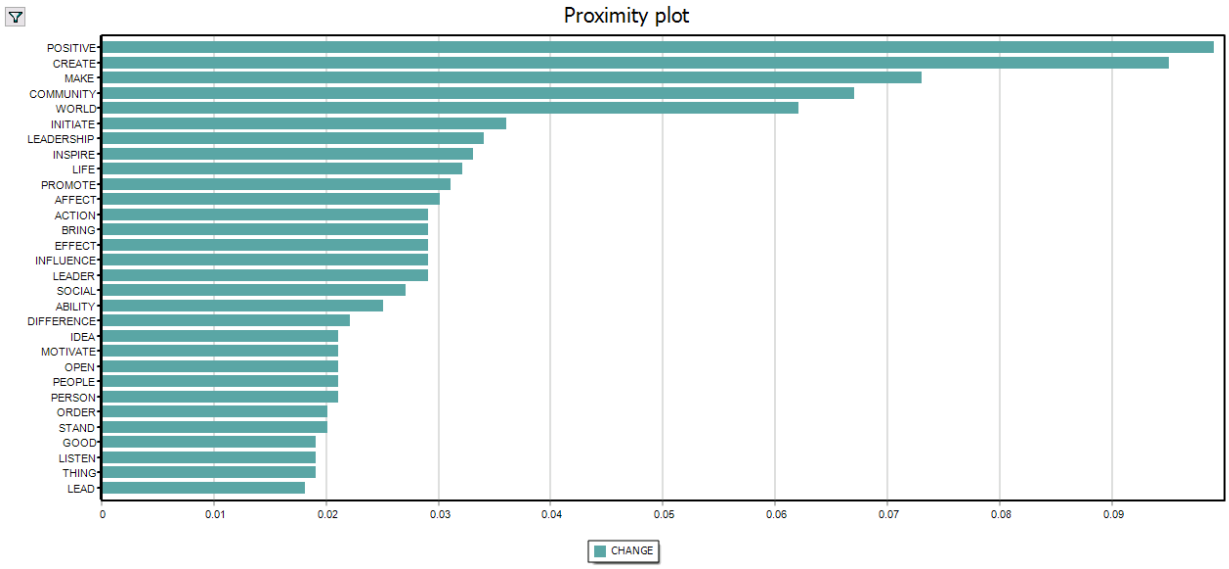
Figure 4.5. Link analysis of word cluster including *create* and *change*.



One final link analysis was performed beginning with the cluster that contains the words *create*, *influence*, *positive*, *change*, and *environment*, and is shown above in Figure 4.5. This graph indicates the connections among conceptualizations that resonate with post-industrial theories of leadership, including positive change in one's environment. For example, *positive* and *change*, *create* and *change*, and *create* and *environment* are three word clusters that each co-occur approximately together 10 percent of the time.

In sum, the link analyses suggest complex but not unexpected patterns in the ways participants communicate their thoughts. For example, *lead* and *leadership* are tightly connected with *goal*, *achieve*, *guide*, and *ability*. By mapping these associations, the network graphs demonstrate how words that, in isolation, may suggest a bias for the industrial paradigm, cluster with similar words to form more complete conceptualizations that effectively realize these theories.

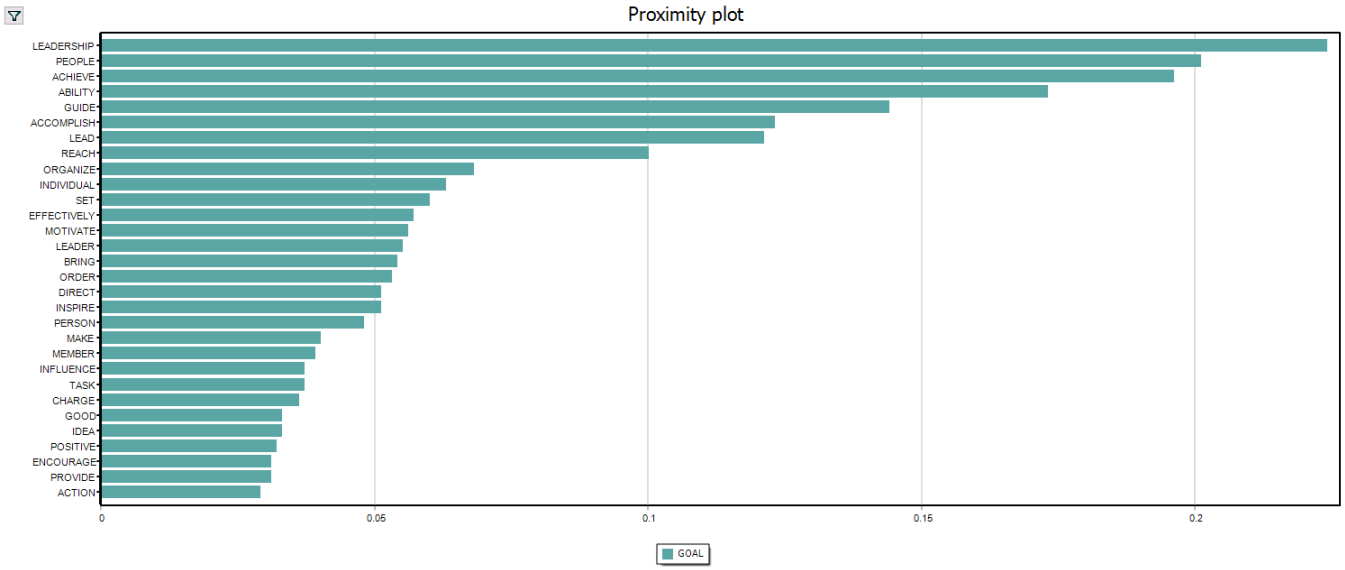
Figure 4.6. Proximity plot indicating relative distance between *change* and associated words



Note: Words shown at the top are found closer in text to keyword *change*.

Proximity plot. An additional tool for examining co-occurring words is the proximity plot. A proximity plot improves upon the network graphs shown through link analysis by approximating the actual distance between selected pairs of words. Figure 4.6 above demonstrates that although the word *change* may be substantially related to a range of other words, it is found closest to *positive* and *create*, followed by *make*, *community*, and *world*. Similarly, in Figure 4.7 below the keyword *goal* is found most closely with the following words, in descending order: *leadership*, *people*, *achieve*, *ability*, *guide*, *accomplish*, and *lead*.

Figure 4.7. Proximity plot indicating relative distance between *goal* and associated words



Note: Words shown at the top are found closer in text to keyword *goal*.

Thematic Analysis: Sentiment Analysis

A specialized categorization dictionary (i.e., include-word list) known as the General Inquirer (Stone, Dunphy, & Smith, 1966)—was employed to investigate subjective mental or emotional states in participant responses. This exploratory process is referred to as sentiment analysis (Ignatow & Mihalcea, 2017). The General Inquirer dictionary covered 75.7 percent of

non-excluded words. Though shy of the desirable 80 percent threshold (Bengston & Xu, 1995) it was determined to be acceptable for these analyses since the General Inquirer is a well-known and long-established lexical resource (Ignatow & Mihalcea, 2017). A frequency chart was developed where all words were absorbed into the dictionary categories, and categories were ranked using the term frequency-inverse document frequency (TF-IDF) weighting method; see Table 4.16 for results.

Table 4.16. Frequency chart of participant responses grouped by sentiment analysis categories and ranked by inverse document frequency.

Category	Frequency	No. Cases	% Cases	TF-IDF
Strong	80136	42940	55.41	20545.1
Passive	54310	34938	45.09	18788.1
Virtue	85729	46967	60.61	18641.5
Positv	144545	57691	74.45	18520.8
Means	45332	32258	41.63	17253.5
Negativ	32224	22827	29.46	17104.2
Power	117428	56251	72.59	16335.4
Active	154808	61230	79.02	15833.1
Complet	26180	21681	27.98	14481.7
Goal	28775	24427	31.52	14426.9
Persist	15102	13907	17.95	11266.2
Arousal	13208	11092	14.31	11150.6
Emot	10896	9052	11.68	10160.5
Vice	10404	8755	11.30	9852.4
Weak	9287	8207	10.59	9055.3
Try	8528	7904	10.20	8454.6
Submit	7065	6459	8.34	7623.7
Pleasure	4804	4413	5.70	5978.6
Need	3394	3177	4.10	4708.2
Fail	3398	3250	4.19	4680.3
Pain	2151	1982	2.56	3424.7
Male	369	317	0.41	881.2
Feel	192	191	0.25	500.8
Female	59	51	0.07	187.7

After weighting by TF-IDF, the five most frequent categories were *strong*, *passive*, *virtue*, *positv*, and *means*. This finding suggests that participant conceptualizations of leadership express a sense of positivity and virtue, an emphasis on processes that lead to goal attainment,

and an understanding of both strengths and passivity in leaders. Each of these categories included responses representing at least 42 percent of cases (i.e., respondents), and it is noteworthy that 74 percent of respondents included words that suggested a positive outlook, the third highest percentage in the dictionary.

The five least frequent categories were *fail*, *pain*, *male*, *feel*, and *female*. This finding suggests that participant beliefs about leadership were not gendered, and that participants avoided discussing the shadow sides and pain points of leadership that include failure to achieve a goal, or a lack of confidence or commitment. Each of these categories included responses representing between 0.1 and 4.2 percent of respondents.

When the full list is sorted by raw frequency statistics—which to a certain extent overlap with the TF-IDF ranking—it is notable that 79 percent of respondents used words that relate leadership to an active orientation, such as *change*, *follow*, *group*, and *process*, while 72 percent of respondents included words related to power, such as *lead*, *leadership*, *control*, *direct*, and *guide*. Nearly 32 percent of respondents used words that suggested a goal orientation (*goal*), although just 28 percent spoke of goal achievement (*complet*), and only 10 percent spoke of working toward goals without necessarily attaining them (*try*).

Crosstab Analysis

Cross-tabulation of words by select independent variables offers a vehicle for disaggregating findings by working status. To determine if students who work while enrolled use different language than those who do not hold a job, four crosstab tables were created. Table 4.17 displays select results of a cross-tabulation between word frequency and two categories of working status—students working on-campus and those not working on-campus. Table 4.18 displays select results of a cross-tabulation between word frequency and two different categories

of working status—students working off-campus and those not working off-campus. Category percentages—that is, the proportion of working or non-working students who used a given word in their response—were compared in these tables against a chi-square critical value to determine if the observed frequencies were associated significantly with word usage. Tables 4.19 and 4.20 display select results when frequent phrases were cross-tabulated with the same two sets of working status categories, as described previously. WordStat was unable to calculate the more fine-grained category percent when performing crosstabs with phrases. Instead, these results relied on case percentages—the proportion of all cases—which were then compared in a chi-square test.

Table 4.17. Statistically significant cross-tabulation results: Words by working status (on-campus only).

Word^	Percent not working on-campus	Percent working on-campus	x^2	p
Organize	3.78	3.06	25.991	***
Direction	3.28	3.95	22.723	***
Ability	15.71	14.49	20.831	***
Strong	1.54	1.93	15.783	***
Power	0.77	0.68	14.780	**
Teach	0.50	0.72	14.730	**
Integrity	0.93	1.21	13.391	**
Situation	3.75	4.28	13.225	**
Serve	1.63	1.30	12.485	**
Sacrifice	0.39	0.25	10.501	**
Success	1.69	2.02	10.008	**
Individual	3.55	4.00	9.963	**
Confident	1.39	1.68	9.787	**
Knowledge	0.72	0.93	9.375	**
Attitude	0.27	0.40	9.350	**
Charge	5.11	5.59	8.360	*
Successful	0.68	0.87	8.076	*
Coordinate	0.48	0.34	7.745	*
Outcome	0.62	0.79	7.603	*
Moral	0.50	0.36	7.293	*
Active	0.48	0.35	6.762	*

Note: Cell values indicate percent of students in that category
^words not lemmatized
*p<.05, **p<.01, ***p<.001

Table 4.18. Statistically significant cross-tabulation results: Words by working status (off-campus only).

Word^	Percent not working off-campus	Percent working off-campus	x^2	p
Change	2.01	2.99	68.454	***
Serve	1.30	2.07	63.714	***
Empower	0.67	1.17	47.648	***
Facilitate	0.56	1.01	46.737	***
Charge	5.60	4.42	44.533	***
Develop	0.48	0.83	32.219	***
Control	2.59	1.94	28.930	***
Inspire	3.73	4.56	28.925	***
Act	2.31	2.97	28.655	***
Experience	0.69	1.07	27.919	***
Grow	0.78	1.17	27.665	***
Create	1.26	1.74	25.703	***
Opportunity	0.35	0.61	25.065	***
Step	1.70	2.22	23.923	***
Recognize	0.44	0.72	23.381	***
Listen	2.71	3.35	22.988	***
Situation	4.12	3.42	20.850	***
Potential	0.67	0.98	20.755	***
Active	0.37	0.61	20.685	***
Skill	1.93	2.41	18.238	***
Talent	0.35	0.57	18.010	***
Communicate	0.96	1.29	16.874	***
Goal	24.41	25.68	15.569	***
Promote	0.32	0.50	15.107	**
Voice	0.58	0.82	14.720	**
Understanding	1.32	1.68	14.546	**
Resource	0.28	0.45	14.270	**
Passion	0.34	0.53	14.063	**
Humble	0.22	0.38	13.997	**
Realize	0.23	0.38	13.604	**

Note: Cell values indicate percent of students in that category
^words not lemmatized
**p<.01, ***p<.001

Word usage by work status. As shown in Table 4.17, a chi-square test for independence indicated a significant association (p<.05) between 21 words and on-campus work status. Students who worked on-campus used the following words at significantly higher rates than their

peers who did not work on campus: *direction*, *strong*, *teach*, *integrity*, *situation*, *success*, *individual*, *confident*, *knowledge*, *attitude*, *charge*, *successful*, and *outcome*. Students who did not work on-campus used the following words at significantly higher rates than their peers who did work on-campus: *organize*, *ability*, *power*, *serve*, *sacrifice*, *coordinate*, and *active*. Each group used language from both the industrial and post-industrial paradigms of leadership theory, therefore these results offer no compelling evidence that students in this sample conceptualize leadership differently when disaggregated by on-campus work status.

As shown in Table 4.18, a chi-square test for independence indicated a significant association ($p<.01$) between 30 words and off-campus work status. Students who worked off-campus used 27 words more frequently than their peers who did not work off-campus, including *change*, *serve*, *empower*, *inspire*, and *listen*. The three words used more frequently by students who were not working off-campus were *charge*, *control*, and *situation*. These results offer preliminary evidence of divergent conceptualizations of leadership among students in this sample, when the sample is disaggregated by off-campus work status. Students working off-campus employed a range of words that largely reflects tenets of post-industrial leadership theory. By contrast, students who did not work off-campus used language from the industrial paradigm at significantly higher rates.

Phrase usage by work status. As shown in Table 4.19, a chi-square test for independence indicated a significant association ($p<.10$) between on-campus work status and 14 phrases comprising at least two words. Students who did not work on-campus used 11 phrases more frequently than their peers who were employed on-campus, including *accomplish a common goal*, *organize a group of people*, and *shared goal*. The three phrases used more frequently by students who worked on-campus jobs were *good leader*, *takes charge*, and *open*

minded. Similar to the analysis of word usage by on-campus work status, phrase usage suggested views from both the industrial and post-industrial paradigms of leadership theory. Therefore these results affirm the earlier finding that students in this sample appear to conceptualize leadership similarly, irrespective of whether they are employed on-campus.

Table 4.19. Statistically significant and substantively relevant non-significant cross-tabulation results: Phrases by working status (on-campus only).

Phrase^	Percent not working on-campus	Percent working on-campus	x^2	p
Accomplish a common goal	0.73	0.61	18.20	***
Good leader	0.55	0.66	6.94	*
Ability to organize	0.48	0.35	6.83	*
People to accomplish	0.47	0.35	5.67	
Takes charge	0.28	0.40	8.60	*
Open minded	0.24	0.33	5.87	
Organize a group of people	0.27	0.15	10.00	**
People in order	0.26	0.17	6.11	*
Full potential	0.23	0.15	5.89	
Charge of a group of people	0.23	0.15	5.33	
Shared goal	0.23	0.14	6.07	*
Ability to take control	0.20	0.13	4.83	
Effectively communicate	0.19	0.10	7.97	*
Make a positive	0.17	0.10	4.85	

Note: Cell values indicate percent of all cases
^phrases not lemmatized
*p<.05, **p<.01, ***p<.001

As shown in Table 4.20, a chi-square test for independence indicated a significant association (p<.05) between off-campus work status and 18 phrases comprising at least two words. Students who did not work off-campus used 8 phrases more frequently than their peers who did work off-campus, including *taking charge*, *taking control*, and *guide people*. Students who worked off-campus used 10 phrases more frequently than their peers who did not work off-campus, including *greater good*, *positive change*, and *means helping*. Similar to the analysis of word usage by off-campus work status, phrase usage by students employed off-campus largely reflected the post-industrial paradigm, while phrase usage by students who are not working off-

campus largely reflected the industrial paradigm. Therefore these results affirm the earlier finding that students in this sample appear to conceptualize leadership differently when their language is disaggregated by off-campus work status.

Table 4.20. Statistically significant cross-tabulation results: Phrases by working status (off-campus only).

Phrase^	Percent not working on-campus	Percent working on-campus	x^2	p
Role model	2.51	2.82	6.24	*
Taking charge	1.80	1.36	18.27	***
Ability to lead	1.60	1.32	7.98	*
Lead a group of people	1.11	0.83	12.08	**
Greater good	0.69	0.88	8.34	*
Taking control	0.71	0.46	15.09	**
Ability to inspire	0.59	0.75	6.25	*
Guide people	0.57	0.41	8.16	*
Positive change	0.34	0.66	38.39	***
Means helping	0.33	0.45	6.60	*
Takes charge	0.36	0.20	13.03	**
Positive manner	0.26	0.15	8.24	*
Leadership is the ability to inspire	0.17	0.28	9.72	**
Leadership is helping	0.15	0.27	10.68	**
End goal	0.13	0.21	6.09	*
Ability to provide	0.19	0.08	12.99	**
Make a positive	0.13	0.21	6.81	*
Means knowing	0.11	0.18	6.20	*

Note: Cell values indicate percent of all cases
^phrases not lemmatized
*p<.05, **p<.01, ***p<.001

Investigating a possible mediator. One alternative hypothesis to the crosstab results discussed previously involves maturation as a mediator. In other words, if students working off-campus are more advanced academically (i.e., juniors or seniors), it is possible that evolving views of leadership related to age or personal development lead to a significantly greater use of post-industrial language, rather than their work status. To test this hypothesis, I ran multiple crosstab tables, first in SPSS, and second in WordStat.

The initial crosstabs investigated working status by class year. Preliminary analysis demonstrates that participants work both on- and off-campus in greater numbers as they advance academically, which further suggests that a maturation effect in conceptualizations of leadership should not vary by work location. The second set of crosstabs investigated words and phrases used by class year, and preliminary analysis provides evidence both to support and refute this alternative hypothesis. Evidence in support can be found through post-industrial language (i.e., *empower*, *facilitate*, *develop*, *inspire*, *grow*, and *communicate*) that was used more frequently by juniors and seniors, and through industrial language (i.e., *charge*, *control*, *situation*, *taking charge*, *taking control*) that was used more frequently by first-year and sophomore students. Evidence that does not support this hypothesis can be found through post-industrial language (i.e., *change*, *serve*, *greater good*, *positive change*) that was used with similar frequency across class year, as well as industrial language (i.e., *skill*, *goal*, *achieve a common goal*, *achieve goals*, *ability to motivate*, *complete a task*) that was used more frequently by juniors and seniors.

In sum, the available evidence is insufficient to accept this alternative hypothesis, although additional research may be useful to explore this question further.

Summary

Exploratory analysis of text data reporting conceptualizations of leadership suggests that students' beliefs adhere largely to tenets of the industrial paradigm. After examining these data thematically using a range of text mining techniques, it appears that a majority of students see leadership in an individual with specific abilities or talents, and who occupies a position of managerial authority, and directs or guides a group of people effectively to achieve a common goal. Moreover, sentiment analysis indicates that most students associate leadership with notions of strength, power, positivity, and virtue. A minority of students views leadership as a non-

coercive, dynamic, relational process that plays out among actively-engaged individuals seeking positive social change and personal transformation through common purpose. Cluster analysis affirms these findings, demonstrating how the most frequent words combine as phrases to form varied realizations of primarily, though not exclusively, industrial theories.

Disaggregation by working status provides evidence to suggest that students who work off-campus describe leadership using words and phrases that more closely resembles the post-industrial paradigm, when compared with their peers who do not work off-campus. By contrast, word and phrase usage does not appear to favor the industrial or post-industrial paradigm when comparing students who work on-campus to those who do not work on-campus.

Summary of Findings

This study aimed to examine associations between college students' paid work experiences and their self-reported capacity and efficacy for leadership, as well as their conceptualizations about leadership. Participants were drawn from the 2015 administration of the Multi-Institutional Study of Leadership (MSL), and 45 percent reported working while enrolled, mostly in positions on-campus. Advanced statistical methods—hierarchical linear modeling (HLM) and propensity score methods—were employed, respectively, to account for the nesting of data and to attempt to reduce the influence of self-selection bias among those students who were working. Results of HLM models suggest that work status and location have a negative association with leadership capacity and a neutral or slightly positive relationship with leadership self-efficacy. In other words, students who work self-report lower scores on a measure of leadership capacity and slightly higher scores on a measure of self-efficacy for leadership.

Conceptualizations of leadership were investigated using text mining methods, and results suggest that the majority of students hold beliefs that reflect tenets of the industrial

paradigm in leadership theory. The industrial paradigm equates leadership with effective management, hierarchical power structures, and efficient goal orientation. A minority of students appears to think about leadership in ways that are consonant with the post-industrial paradigm, which emphasizes relational, non-coercive processes and seeks positive, transformational change in positional leaders, followers, and society. Furthermore, disaggregation by working status suggests that students who work off-campus use specific words and phrases that reflect the post-industrial paradigm at significantly higher rates than their peers who do not work off-campus.

Chapter Five: Discussion

This chapter aims to address the overarching research question that guided the investigation and consider implications for research and practice. To accomplish these goals, the findings described in chapter four will be interpreted in light of the extant literature, followed by a reflection on the theoretical framework, a summary of the main findings, and a discussion of the ways in which this study makes important contributions to methodology and practice.

Responding to the Research Question

The overarching research question for this study asked the following: How do college students' paid work experiences relate to their leadership capacity and beliefs about leadership? The first part—relationships among work experiences and leadership capacity—was addressed with descriptive and predictive statistical analysis as discussed in the sections on the first and second research questions. The second part—relationships among work experiences and beliefs about leadership—was addressed with text mining analysis as discussed in the section on research question three.

A Modest, Negative Relationship between Work and Socially Responsible Leadership Capacity

The findings suggest that students who worked for pay while enrolled identified themselves as less aligned with the values of the social change model, when compared with peers who didn't work. Small, but statistically significant effect sizes indicated that students who work rated themselves as having lower leadership capacity. Work location mattered in this relationship; the results suggested that self-reported leadership capacity varies across workplaces. For instance, students working at their institution's library or public safety offices reported scores on the SRLS measure that were 0.27 standard deviations below the mean, while

scores for students working in spiritual life departments were predicted to drop only half as much. Leadership capacity scores varied by institutional context as well. The sharpest change was visible among those students identified as working in administrative departments at religious institutions, whose drop in leadership capacity scores was predicted to double when compared against similarly-working students at secular institutions. The number of hours worked each week was unassociated with leadership capacity.

This is a troubling finding, given how many students work for pay while enrolled. It is unclear why this association is evident, or why the relationships would be more strongly negative for students employed in certain locations, or at certain types of institutions. Longitudinal investigation would be required to assess possible directionality in these relationships. For instance, it is possible that work is implicated in lower self-assessed leadership capacity. If this were true, then some characteristics of the work experience—for example, the ways in which students at the library are managed or carry out their work—might predict a weaker adherence to norms of socially responsible leadership. In that case, college officials would need to consider overhauling their student employment program if they hoped to produce a different type of future leader. From another perspective, it is possible that those students who identify less with the SCM are more likely to seek out paid employment on-campus as opposed to other campus activities. If this were true, one implication would be to assess students' capacity for socially responsible leadership at enrollment and then track their subsequent choices of extra- and co-curricular activities.

Relationship between Work and Self-Efficacy for Leadership is not Practically Significant

The data also suggest weak, positive relationships between work variables and self-efficacy for leadership. Despite occasional statistical significance in the HLM models, there were

no practically significant associations among work status or hours worked per week and leadership self-efficacy. One noteworthy finding proved to be an exception: students working off-campus at mid-size institutions (enrollment of 5,000-10,000) were predicted to report slightly higher self-efficacy for leadership (0.20 standard deviations above the mean).

This finding is also troubling, as it indicates that students who work are no more likely to see themselves as leaders than their peers who do not work, despite the fact that their work experience may include peer supervision or other tasks generally associated with leadership, and may also help them attain professional roles crafted with both authority and leadership in mind. Perhaps student workers are not observing much in the way of socially responsible leadership on the job? Or perhaps they are not given any space or time to sharpen and practice these skills? A future investigation could examine these questions and attempt to determine if working might relate to other elements of self-concept, or if certain types of work experiences are more strongly predictive of self-efficacy for leadership.

Most Students Equate Leadership with Industrial Principles

Irrespective of work status, most students equated leadership with effective management. They used language that reveals industrial-paradigm conceptualizations. For the majority of students in this sample, leadership is entwined with power and hierarchical structures, and leaders are individuals who direct, motivate, and guide others to accomplish a common goal. When conceptualizations of leadership were disaggregated by workplace location (on-campus, off-campus, or in both locations) one key variation emerged: students who work off-campus described leadership using more post-industrial language. Unfortunately, the data set provided no details about off-campus workplace environments that would allow for generation of hypotheses about this particular finding.

Among a minority of students in this sample, work was associated with the view of leadership that echoes the definition included within the social change model (SCM): "a purposeful, collaborative, values-based process that results in positive social change" (Komives, Wagner, & Associates, 2009, p. xii). For these students, group values predominated. Many used words and phrases that spoke to collaboration and common purpose, although *common purpose* and *common goal* were often used interchangeably, and contemporary scholars would likely privilege the former. Others spoke of congruence, an individual value, and change, the hub and ultimate purpose of the SCM. Few, if any, appeared to mention two distinctive SCM values: controversy with civility and citizenship. Further reflection on this latter observation can be found in the section below on revisiting the SCM.

This study can't suggest why off-campus workers might hold more contemporary views of leadership, but it provides preliminary evidence of this distinction and raises important questions. Why do the vast majority of college students continue to equate leadership with hierarchical leaders and goal achievement rather than process? Are students who work off-campus engaged in a fundamentally different experience than their peers who do not work or who work only on-campus? Are off-campus workers older or more developmentally mature and therefore more likely to view leadership through a post-industrial lens? Preliminary analysis addressed in chapter four suggests that more research is needed to address this question in particular. As discussed below, one possible hypothesis implicates post-secondary institutions as organizations infused with industrial-era structures and functions. From this perspective, organizational theory would provide the most appropriate framework for analyzing the extent to which colleges and universities are founded, managed, and resourced in ways that are antithetical to post-industrial precepts.

Although these findings are fairly robust due to the quasi-experimental method, they make no claim to causation, and can only speak to the relationships identified among key variables. In other words, despite a significant relationship among work status, work location, and leadership capacity, there is no clear evidence for the directionality of these relationships. Nevertheless, it is important to interpret these relationships in light of the literature used to ground the investigation, recognizing that any subsequent hypothesis would need testing in a future study.

Validating and Advancing the Literature on Leadership

In many ways these findings echo the current literature on leadership theory and student leadership development. In particular, students' conceptualizations of leadership were largely consonant with behavioral and trait theories, two hallmarks of the industrial paradigm. As Northouse (2016) described, behavior theory privileges both task behaviors (i.e., those that are goal-oriented) and relationship behaviors (i.e., those that are concerned with nurturing followers). Trait theories suggest distinctive characteristics of leaders that make them different or successful.

Resonance with behavioral theory. Overwhelming evidence from multiple text mining activities demonstrates that students in this sample see goal orientation and accomplishment as strongly tied to leadership. First, the word *goal* was found in nearly 25 percent of cases, more than any other word except *leadership*, and five of the 20 most frequent phrases included the word *goal*. Moreover, some participants described leadership, in part, with words related to goal orientation, such as *achieve* (5.8 percent of cases) and *accomplish (*4.5 percent). Second, the principal component extracted from the largest number of cases (over 35 percent) included the words *bring*, *people*, and *goal*. An additional component, found in over 10 percent of cases,

included the words *set*, *achieve*, and *goal*. Third, a link analysis suggested that the words *leadership* and *goal* co-occurred at a higher rate than any other combination of words across all respondents and words included for analysis. A separate link analysis captured the strong relationship between the word *task* and words like *complete* and *accomplish*. Fourth, sentiment analysis indicated that 31 percent of cases included words that suggested goal orientation, while 28 percent included words related to goal completion. By contrast, only 10 percent used words that spoke to the act of trying to reach a goal, without necessarily having accomplished it. Words that discussed failure only arose in 4 percent of cases. These findings contend that leadership is synonymous with goal completion, while failure to achieve a goal is rarely contemplated by leaders.

Similar evidence demonstrates that students also pair leadership with relationship behaviors, the second tenet of behavioral theory. First, the word *people* was found in 21 percent of cases (the third highest word percentage, behind *leadership* and *goal*), suggesting that many respondents are aware that leadership necessitates working with others (Rost, 1991). Additional words that were found in 3-4 percent of cases include *inspire* and *motivate*. The third most common phrase in this corpus was *role model*, found in 2.6 percent of cases. Second, multiple topics extracted through principal components analysis suggest that leaders are defined by their support of followers. For instance, nearly 5 percent of cases included the words *everyone's*, *opinions*, *thoughts*, *ideas, consideration*, and *account*, indicating views of leadership that make room for alternate viewpoints. Third, link analyses highlight a strong co-occurrence between *leadership* and *people*, appearing together in 21 percent of cases in which either word appears, and a modest co-occurrence between *leadership* and two words: *motivate* and *inspire*; each set appears together in 5 percent of cases in which either word is present. Taken together, these

findings assert that leadership is found wherever a leader works with other people and, in some circumstances, offers them inspiration or elicits motivation.

These findings make intuitive sense to even a casual observer of contemporary American higher education. Institutional officials identified as leaders—for example, the president, provost, deans, department chairs, and program directors—are marked as such by their power to convene others and advance a particular agenda. In fact, their success is often attributed to their ability to accomplish specific goals articulated in advance by a strategic plan, or from a more senior official. College leaders are judged publicly on their ability to collaborate with others in their work, and to consider students' opinions in particular. As one example from a student's perspective, a vice president for student affairs is a successful leader not because she/he is self-aware and facilitates a non-coercive process of shared uplift among direct reports, but rather if she/he manages a department that effectively meets student needs and consistently improves the quality of student life. Process is not the focus here; success lies in both immediate and long-term outcomes.

Resonance with trait theory. Participants utilized a wide range of language to communicate desirable characteristics of leaders rather than particular behaviors a leader might enact. These findings suggest that some students in this sample hold a belief in a "heroic, singularly remarkable" individual who can accomplish great things on the strength of her own capacities (Guthrie, et al., 2013, p. 20). The fifth most frequently-used word, found in 15 percent of cases, was *ability*. Relying on dictionary definitions, I interpreted *ability* to mean possessing a particular competence or proficiency (Merriam-Webster, 2017). The second most frequent phrase, found in 4.4 percent of cases, was *leadership is the ability*; another common phrase, found in 1.5 percent of cases (despite its circular logic), was *ability to lead*. Link analysis

confirms this association; *leadership* and *ability* were found co-occurring in 17 percent of cases in which either word appeared. Principal components analysis extracted several topics that indicated students' beliefs in distinctive characteristics of leaders, including the groupings of *inspire*, *motivate*, *ability*, and *encourage* (17 percent of cases), and two components reflecting a total of 6 percent of cases that included words related to effective and efficient communication skills. Sentiment analysis is an ideal method for uncovering a bias for specific traits, given its sensitivity to less observable beliefs. Here the largest number of participants (79 percent of cases) equated leadership with an active orientation, while just over half the sample (55 percent of cases) used words that denoted strength; the opposite poles—passive orientation, and weakness—were found in just 45 percent and 11 percent of cases, respectively. In sum these findings assert that—for this group of students, who are reasonably representative of students at four-year colleges and universities (Eagan et al, 2017)— leadership is a predisposition or intrinsic ability among strong, actively-engaged individuals to enact specific behaviors that suggest leadership, such as inspiration, motivation, and encouragement of others.

These findings are similarly unsurprising. College students seem more likely to view institutional officers as better equipped for their job than anyone else, until their behavior proves otherwise. Failing to witness the ways in which an academic dean carries out her work, for example, leaves the student ignorant of how she conducts herself among department chairs, but with a heightened awareness of the dean's public statements, such as the ways in which she pronounces student names at graduation. Likewise a resident director is presumed more capable than a resident assistant, an athletics coach is presumed more knowledgeable than the team captain, and a university chaplain is presumed to possess greater capacities for spiritual guidance

than an assistant chaplain. In each of these cases, innate ability is taken for granted when students consider why someone is placed in a leadership position.

Other hallmarks of industrial thinking. Participants also provided ample evidence to demonstrate that leadership is synonymous with power, authority, hierarchy, and effective management of others. Frequently used words like *charge* (5 percent of cases), *set* (4 percent of cases) and *direction* (3 percent of cases) illuminate this particular belief, as do words like *guide* (11 percent of cases), which I would interpret as a gentler form of directing others, and *provide* (3 percent of cases). The fifth most common phrase, found in 1.7 percent of cases, was *taking charge*. Principal components analysis echoed the univariate frequencies, extracting components like one that included the words *situation*, *control*, *taking*, and *charge*, which was found across nearly 14 percent of cases, and *decision(s)*, *make*, *making*, and *tough*, found across nearly 8 percent of cases. Link analyses emphasize this point, demonstrating that in nearly 6 percent of cases with the word *leadership*, either *charge* or *situation* would co-occur. The word *situation*, in turn, was frequently found near the word *control*. Finally, sentiment analysis indicated that words associated with power were found in over 72 percent of cases, the third highest percentage among 24 lexical categories. Aggregating these assorted findings, it becomes clear that management principles are central to leadership as defined by these students. Leaders take control of a situation, and assert their power by setting direction for a group and making decisions.

These findings present fascinating questions about how students think about power, and they suggest that leaders are distinctive in their ability to wield power successfully through decisive action or an ability to control and steer others in a particular direction. Why would college students perceive leadership to be related to taking charge, setting direction, or making

decisions? I would argue that recognized authority—the power to decide, to take action that affects others—is among the least questioned aspects of leadership as it exists for students today. Wherever one looks across the collegiate bureaucracy (e.g., professors, supervisors, coaches, deans) the higher placed someone is in the organizational structure, the more decision-making authority they possess. For students who prefer to accept rather than question authority, this is the natural order on a college campus. As George W. Bush famously said in 2006, "I'm the decider, and I decide what's best" (Stolberg, 2006, para. 5). Future research could examine the ways in which power and authority are axiomatic among student leaders. Are they re-enacting behaviors observed in college faculty or staff, or in their supervisors?

Post-industrial conceptualizations and perspectives that straddle the paradigms. Using words like *good, positive*, *success*, and *change* or phrases like *positive change*, *move forward*, or *common good*, a smaller number of students provided evidence they think about leadership in post-industrial terms (Astin & Astin, 2000; HERI, 1996; Komives, Dugan et al., 2010; Rost, 1991), or may be grappling with moral/ethical and transactional/transformational dimensions of leadership that encompass aspects of both paradigms (Burns, 1978; Bass, 1985, 1990; Northouse, 2016). As one example, many students referenced striving toward common goals, as discussed above, and goal orientation has ties to each paradigm. Most notably, common purpose is a group value of the social change model. The key difference appears to be that post-industrial thought emphasizes the process of striving toward a mutually-satisfying goal, even if that goal is never reached (Rost, 1991). For industrial leaders, moving toward a shared goal is meaningless without achievement; most students here appeared to emphasize goal achievement.

Other students who evoked post-industrial themes used language that addressed the fluid nature of positional leadership, as in the nearly 8 percent of cases that used some combination of

the words *leader(s)*, *followers*, and *true* to describe how true leaders recognize and encourage followers to lead as well, or the nearly 2 percent of cases that used the words *knowing* and *step* to explain that leaders know when to step back to let others lead. Finally, others spoke to the need for leaders to be congruent in their thoughts, words, and behaviors. Each of these themes is evocative of the more advanced stages of the leadership identity model (Komives, Longerbeam, et al., 2006). In sum, these findings indicate that a minority of students sees leadership closely related to positive social change and a dynamic, relational process among positional leaders and followers. Since the text mining analysis included responses from the full sample but avoided disaggregation across control variables, future studies should examine if they vary across demographic categories unrelated to work. For example, students who are more advanced academically or developmentally may be responsible for this finding.

Students who were employed off-campus demonstrated post-industrial conceptualizations at significantly higher rates than their peers who were not working off-campus. Post-industrial viewpoints were evident among off-campus workers across a wide range of words (e.g., *change*, *serve*, *empower*, *inspire*, and *listen*) and phrases (e.g., *greater good, positive change, and means helping*). By contrast, those who did not work off-campus used phrases like *taking charge*, *taking control*, and *guide people* more frequently. Much more needs to be understood about off-campus work environments to expand upon this finding. What types of work are students engaged with off-campus? What might cause them to more readily equate leadership with post-industrial concepts? Could college officials capture and extend any lessons from off-campus workplaces to enhance the on-campus work experience? The extant literature on working students is nearly silent on the experience of those working off-campus; future research must begin to probe deeper in this area.

Validating and extending prior studies. These findings mirror those of Haber (2011, 2012), who investigated 1,100 responses to an identical question in an earlier administration of the MSL, and found mostly hierarchical thinking that equated leadership and leaders. This study also echoes the findings of Shertzer and Schuch (2004), whose focus group participants equated leadership with positional authority and held views consonant with trait theory, and Logue et al. (2005), whose single-institution sample highlighted the positive experience that six student leaders found as common ground.

This study advances the literature in two ways. First, these findings are the first to differentiate beliefs about leadership by working status and demonstrate divergent conceptualizations when comparing students who work off-campus to those who do not hold off-campus jobs. Second, this study suggests that the paradigmatic shift among scholars from industrial to post-industrial leadership theory has not taken hold among the mostly white, mostly female students captured by this sample.

Validating and Advancing the Literature on Working College Students

The findings of this study also advance the literature on working college students, particularly in contradicting earlier research that linked off-campus work with uniformly negative outcomes (Astin, 1993b; Ehrenberg & Sherman, 1987; Pike et al., 2008). Most notably, this study simultaneously contradicts and validates aspects of the only study to date that examined the effects of work on socially responsible leadership capacity (Salisbury et al, 2012). The contradiction arises from the quantitative findings of this study. It must be noted that the two studies employed different methodologies and therefore do not present a clean comparison. Nevertheless, this study suggests that the association between working—whether on-campus, off-campus, or in both locations—and overall leadership capacity is negative, whereas Salisbury

et al (2012) found a positive relationship among students who held off-campus jobs and largely non-significant effects for students working on-campus. Several comparative strengths of this study—quasi-experimental methods as well as a larger sample size—suggest that these findings are reliable. Furthermore, 45 percent of this sample reported working while enrolled, a figure that adheres closely to the national percentage (41 percent) of full-time students who are also working (Snyder et al, 2016). The sample in Salisbury et al (2012) is not nearly as representative, a point the authors acknowledge.

The validation of Salisbury et al.'s (2012) findings arises from the text mining results that indicate students who work off-campus use language consonant with post-industrial conceptualizations of leadership at significantly higher rates than their peers who were not working off-campus. Salisbury et al (2012, p. 318) found at least 10 hours per week of off-campus work to be "uniquely beneficial to student leadership development." This study corroborates that finding, in so far as off-campus workers expressed viewpoints that suggest an adoption of many of the tenets of the social change model (SCM). Similarly, the prior study found on-campus work to have "almost no impact" on leadership development, and the present study likewise suggests that there is no significant difference in industrial or post-industrial conceptualizations when comparing students who work on-campus with those who do not work on-campus (Salisbury et al., 2012, p. 318).

Revisiting the Social Change Model

Results of this study suggest a disconnect between the values described by the SCM, which overlap substantially with tenets of post-industrial leadership theory, and the leadership self-assessment of most working college students. The vast majority of working students captured in this sample held positions on-campus, and those students were associated both with

lower leadership capacity scores, and with definitions of leadership that were no different from the primarily industrial conceptualizations of their non-employed peers. Is the SCM somehow more compatible with the experiences that students are having in off-campus workplaces? Do on-campus workplaces adhere to conventional, industrial norms to a greater degree than off-campus workplaces?

These questions would require testing in a future study, however evidence collected here calls attention to possible problems with the theoretical model. Specifically, the notable absence of any mention of citizenship (the sole community value) or controversy with civility (one of three group values) suggests that students conceptualize a less nuanced version of this model. This finding raises other important questions: How are college students instructed in principles of citizenship? Are there places where instruction in effective leadership and good citizenship overlap? What opportunities exist for students to observe and practice navigating through controversy and strong differences in opinion? For the portion of this group whose views mostly align with the SCM, a leader is someone whose values, words and actions are congruent; supports followers in their personal growth; collaborates effectively with others; and works toward positive change. Controversy is absent, and change is not tied to democratic ends, just generic social betterment.

The SCM is touted as an applied model, one that translates well to student leadership development programs (Dugan, Bohle, Woelker, & Cooney, 2014; Kezar et al., 2006). However, a theoretical problem in which two of its eight values don't map onto the student experience suggests that the model as it stands hasn't taken hold comprehensively in the minds of contemporary undergraduates. Furthermore, a methodological problem arises when students complete the SRLS. The current version measures just six of the original eight dimensions—

three individual values, two group values, and one community value. Although the change scale is no longer assessed, little variation in the controversy with civility value, as suggested by the text mining results of the present study, may impact the SRLS group values scale score and subsequent overall leadership capacity score.

Conclusions

There are four main conclusions that can be drawn from this study. The first conclusion is that the vast majority of students who completed the 2015 MSL, irrespective of working status, equate leadership with principles of industrial theory. This finding seems to be driven by students working on-campus and students not working at all; both groups employed similarly managerial language. However, a sizable minority of participants—those who reported holding a job off-campus—asserted post-industrial perspectives when defining leadership, suggesting an interesting variation in conceptualizations of leadership.

The second conclusion is that working while enrolled is associated with lower self-reported capacity for socially responsible leadership, and that this relationship varies across on-campus workplace locations and institutional characteristics. This finding is driven by robust statistical models, generated in part through the use of quasi-experimental methods, which demonstrate this relationship across all working environments. This conclusion challenges the findings of Salisbury et al (2012), who found a positive association between work and socially responsible leadership capacity, albeit using different methods and a much-different sample.

The third conclusion is that the SCM is not resonating fully among contemporary college students. Specifically, even as some students are using language compatible with the model, few if any were found to discuss the importance of controversy with civility or broad principles of citizenship that ground the community domain. I would argue that the model is not whole

without these parts, and therefore further research would need to examine if these content areas remain absent among subsequent cohorts. If so, possible implications include revisions to the model, or to the leadership education programs that teach the SCM.

The fourth conclusion is that text mining is a useful methodology for investigating unstructured data in large-scale data sets, such as the MSL, that would otherwise be forgotten. Since the MSL launched in 2006, only one previous investigation (Haber 2011, 2012) examined student beliefs about leadership, and that study used conventional methods of content analysis. In other words, multiple administrations of the MSL have passed without a formal inquiry into student conceptualizations. Data mining methods and available software have each advanced to the point where examinations of text data are relatively straightforward, and should be performed routinely where researchers have access to large troves of open-ended participant responses.

Implications for Research

Methodological Advances

This study advances methodology in assessing how college experiences impact students through its use of text mining and propensity score analysis.

Text mining. Text mining presents an efficient, scalable method to separate signals and noise in large-scale text data. It is therefore an effective tool to analyze open-ended survey responses, as in the present study, as well as the tremendous amount of text that students, faculty, and staff produce through their interactions across social media, course management systems and other online platforms. Conceptually, this study demonstrates why researchers ought to think of all text as potential data to be analyzed, and why quantitative researchers in particular might wish to prioritize the collection and use of text data in large-scale, multi-institutional, and nationally representative surveys. Findings that include text data may be more persuasive, and higher

education officials and policy makers who frequently consume these data would benefit in their decision-making. Most importantly, text mining preserves participant perspectives in their own words, and therefore can minimize the loss of nuance when survey data are aggregated across thousands of participants.

Logistically, text mining software makes the actual process relatively easy, and allows researchers to pursue qualitative questions in large-scale data sets without needing an army of coders. WordStat was able to perform multiple activities associated with pre-processing and knowledge extraction (e.g., univariate frequency counts, cluster analysis, principal components analysis) that allowed for a meaningful review and synthesis of participant responses, and the subsequent development of themes inductively. Text mining methods excel in addressing questions of a linguistic nature. Given the well-documented definitional problem with a word like *leadership* (Bass, 1990; Northouse, 2016; Rost, 1991), the software allows for the disambiguation of meaning across a nearly unlimited range of words and phrases, and provides full quotes on demand for added context.

Propensity score analysis. Propensity score analysis is an effective way to address modeling concerns related to endogeneity or self-selection bias, as was the case here with working college students (Perna et al., 2006; Riggert et al., 2006; Stinebricker & Stinebricker, 2003; Triventi, 2014). As discussed extensively in chapter three, propensity scores are neither simple to use nor infallible, in light of the many subjective decisions made during their generation. However, when created thoughtfully, there is no question the propensity score permits a more robust examination of observational data where self-selection bias is undeniably a factor (Bowman et al., 2015). In this study, weighting the sample using this quasi-experimental method allowed for a robust and substantive investigation of variation among working college

students, an important consideration when assessing the impacts of work (Cheng & Alcántara, 2007; Riggert et al., 2006).

Limitations and Future Research

Several limitations in this study should be noted, along with a recommend path to address these shortcomings in future research. First, the MSL data arises from a sample heavily weighted with students from private, selective institutions. Although the demographic profile of these students is reflective of current college-going trends at four-year institutions (Eagan et al., 2017), conclusions about the relationships among work and leadership capacity or beliefs that can be drawn from this study may be less generalizable to the student experience at public or less selective institutions. Future research could disaggregate the sample by institutional control or selectivity before testing research questions.

Second, given the previously-stated limitations of the SCM, it may not be the most appropriate theoretical model to use when investigating student leadership development. Further research needs to examine the efficacy and future applicability of the model. Specifically, additional text mining research on conceptualizations of leadership could further explore the question of whether students represent each of the core values in the model or continue speaking around broad principles of citizenship and controversy with civility.

Third, this study was concerned with variation in leadership conceptualization among working and non-working college students; however without much effort this question could easily be expanded to examine variation across a range of covariates—demographic, environmental, or institutional. For instance, do male- and female-identified students use different language to describe leadership? Prior research has suggested “a female propensity” for leadership capacity that is defined in post-industrial terms (Dugan, 2006; Dugan et al., 2008;

Eagly et al., 2003; Komives et al., 2011); therefore this question might yield substantively interesting findings. As shown in the HLM tables, many control variables were negatively associated with leadership capacity or self-efficacy; future studies should examine these associations more deeply. These data could also be used to classify participants with primarily industrial, bridge, or post-industrial labels (via the text categorization method); crosstab analysis would subsequently be used to examine variation in paradigm across demographic, environmental, or institutional categories.

Fourth, future quantitative examinations of the effects of work on college students should collect data on specific workplace experiences in order to explore whether job responsibilities and tasks might be associated with leadership or other key outcomes (Eraut, 2007). For instance, I found in an earlier study significant associations between leadership capacity and job-related tasks such as peer observation, feedback from a supervisor, and idea experimentation (Lewis, 2010). Large-scale surveys (e.g., MSL, NSSE, CIRP) are in an ideal position to gather these data and invite outside researchers to undertake a more comprehensive examination of variation in outcomes among working students.

Finally, more research is needed on the experience of students working off-campus. Despite a rigorous search, I was unable to find a quantitative study that gathered information beyond top-level work location (on-campus, off-campus) and number of hours worked each week. The one exception was the MSL, which captured data on specific offices or departments in which on-campus employees spend the majority of their work hours. In light of these findings, it would have been tremendous to have similar data for off-campus workers to allow for a deeper investigation; MSL staff ought to consider adding such a question to future surveys.

Implications for Practice

These findings suggest that students who work are associated to a lesser extent with the values of the SCM, and on-campus work is associated, in some cases, with more dramatic departures from the mean, as well as with industrial perceptions of leadership. It seems possible, therefore, that on-campus work is effectively reinforcing entrenched cultural values that favor industrial approaches to leadership, and that a new approach to leadership education is required among faculty and staff who supervise student employees.

On-campus Workplaces may Reinforce Industrial Conceptualizations

Examples abound both within and outside higher education of a bias toward industrial structures and assumptions. After all, the modern university is a corporate environment, with administrative hierarchy eclipsing a professional bureaucracy (Mintzberg, 1979) and attending to all possible avenues for revenue generation (Slaughter & Rhoades, 2011). It seems reasonable to propose that on-campus workers, in particular, may be absorbing messages that echo management principles: leaders are strong, positive, visionary, supportive, goal-directed individuals who enact specific behaviors or possess specific traits. In other words, student employees may be seeing first-hand that leadership in higher education, similar to leadership in our society at large, is defined by a leader, rather than a process. Some models of college student leadership development (Kouzes & Posner, 1987/2012) further reinforce this association. For individuals who prize collaborative, relational, non-hierarchical leadership, this is likely a troubling hypothesis.

A New School of Leadership Remains a Priority

Lest this argument become too heavy-handed, it should be noted that many students in this study described leadership in different terms: as a process of change, a way to support one

another, a vehicle for personal growth, or a collaboration among individuals. These are all positive findings among those who find affinity with contemporary scholars' views on the practice of leadership. On the whole, however, the findings indicate that a "new school of leadership" is still required for students who work while enrolled, and perhaps elsewhere across higher education, to better prepare them to address contemporary social problems (Astin & Astin, 2000; HERI, 1996; Rost, 1991, p. 126).

More specifically, this study breathes new life into a long-running critique of "missed educational opportunity" among on-campus employers (Chickering, et al., 1996; Devaney, 1996; Kincaid, 1997; Salisbury et al., 2012, p. 320). Given the financial realities of attending college, students will almost certainly continue to work in large numbers while also taking classes, and a large proportion will find those jobs in campus departments. Faculty and staff supervisors, therefore, have a responsibility to develop post-industrial competencies in their student employees, and to explore their underlying consonance with broader values in higher education, such as collaborative approaches to teaching, scholarship, and governance. Adopting a human resource lens, faculty and staff could revise position descriptions and evaluation protocols (Lewis & Contreras, 2009) to emphasize post-industrial leader behaviors such as collaboration, mutuality, and influence and de-emphasize hierarchal or controlling behaviors. Supervisors should explicitly distinguish leadership from management, and call attention to this dynamic regularly as it shifts in the course of administrative or research work. This education can be didactic. For example, a distillation of the leadership theories discussed in chapter two might say simply that managers ensure that a common goal is accomplished, while leaders facilitate a process that is noncoercive, active, and mutually reinforcing among all participants. Ideally, this coaching would foster a metaphoric bilingualism among students before they enter the job

market, helping them prepare to enact post-industrial leadership successfully in a largely industrial world.

Summary

Using quasi-experimental methods, this study suggests that working for pay is associated with decreased leadership capacity as defined by the social change model. The study further suggests that students who work off-campus share conceptualizations of leadership with contemporary, post-industrial scholars, to a greater degree than their peers who are not working off-campus. The findings both echo and challenge the existing literature on leadership and working college students. Future research should explore off-campus work environments in greater detail, while practitioners and scholars who supervise students should work to infuse post-industrial conceptualizations into on-campus work environments.

References

Abes, E. S., Jones, S. R., & McEwen, M. K. (2007). Reconceptualizing the model of multiple dimensions of identity: The role of meaning-making capacity in the construction of multiple identities. *Journal of College Student Development*, *48*(1), 1–22. doi:10.1353/csd.2007.0000

Adelman, C., Ewell, P., Gaston, P. & Schneider, C. G. (2014). The degree qualifications profile. Indianapolis, IN: Lumina Foundation.

Altbach, P. G. (2011). Patterns of higher education development. In Altbach, P.G., Gumport, P.J. & Berdahl, R.O. (Eds.) *American higher education in the twenty-first century: Social, political, and economic challenges, third edition*. Baltimore, MD: Johns Hopkins University Press.

American Association for Higher Education, American College Personnel Association, & National Association of Student Personnel Administrators. (1998). *Powerful partnerships: A shared responsibility for learning*. Washington, D.C.: Author.

American College Personnel Association. (1996). The student learning imperative: Implications for student affairs. *Journal of College Student Development*, *37*(2), 118–122.

American Council on Education. (1937). *The student personnel point of view*. Washington, D.C.: Author.

Antonio, A. L. (2001). The role of interracial interaction in the development of leadership skills and cultural knowledge and understanding. *Research in Higher Education*, *42*(5), 593–617. doi:10.1023/A:1011054427581

Arminio, J. L., Carter, S., Jones, S. E., Kruger, K., Lucas, N., Washington, J., Young, Nancy, & Scott, A. (2000). Leadership experiences of students of color. *NASPA Journal*, *37*(3), 496–510. doi:10.2202/1949-6605.1112

Arum, R., & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses*. University of Chicago Press.

Arum, R., & Roksa, J. (2014, September 2). Let's ask more of our students--and of ourselves. *The Chronicle of Higher Education*, p. A48.

Association of American Colleges and Universities. (2002). *Greater expectations: A new vision for learning as a nation goes to college*. Washington, D.C.: Author

Association of American Colleges and Universities. (2007). *College learning for the new global century*. Washington D.C.

Astin, A. W. (1977). *Four critical years*. San Francisco: Jossey-Bass.

Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Development*, 25, 297–308.

Astin, A. W. (1993a). An empirical typology of college students. *Journal of College Student Development*, *34*(1), 36–46. doi:10.1017/CBO9781107415324.004

Astin, A. W. (1993b). *What matters in college: Four critical years revisited*. San Francisco: Jossey-Bass.

Astin, A. W., & Astin, H. S. (2000). *Leadership reconsidered: Engaging higher education in social change*. Battle Creek, MI.: W. K. Kellogg Foundation.

Astin, A. W., & Denson, N. (2009). Multi-Campus Studies of College Impact: Which Statistical Method is Appropriate? *Research in Higher Education*, *50*(4), 354–367. http://doi.org/10.1007/s11162-009-9121-3

Austin, D. (n.d.). *We recommend a singular value decomposition*. American Mathematical Society feature column: Monthly essays on mathematical topics. Retrieved from http://www.ams.org/samplings/feature-column/fcarc-svd.

Austin, P. C. (2011). An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behavioral Research, 46*, 399–424. doi: 10.1080/00273171.2011.568786

Avolio, B. J., & Gardner, W. L. (2005). Authentic leadership development: Getting to the root of positive forms of leadership. *Leadership Quarterly*, *16*(3), 315–338. doi:10.1016/j.leaqua.2005.03.001

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W. H. Freeman and Company.

Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York, NY: Free Press.

Bass, B. M. (1990). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics*, *18*(3), 19–32. doi:10.1016/0090-2616(90)90061-S

Bass, B. M., & Avolio, B. J. (1990). *Multifactor leadership questionnaire*. Palo Alto, CA: Consulting Psychologists Press.

Bengston & Xu (1995). *Changing national forest values: A content analysis*. (Report No. NC-323). St. Paul: North Central Forest Experiment Station, Forest Service, U.S. Department of Agriculture.

Blimling, G. S. (2013). Challenges of assessment in student affairs. *New Directions for Student Services*, *2013*(142), 5–14. doi:10.1002/ss.20044

Bowman, N. A., & Seifert, T. A. (2011). Can college students accurately assess what affects their learning and development? *Journal of College Student Development*, *52*(3), 270–290.

Brubacher, J. S. & Rudy, W. (1997). *Higher education in transition: A history of American colleges and universities, fourth edition*. Baltimore: MD: Johns Hopkins University Press.

Bureau of Labor Statistics (2015). Time use on an average weekday for full-time university and college students. Washington, D.C.: American Time Use Survey. Retrieved from http://www.bls.gov/tus/charts/students.htm.

Burns, J. M. (1978). *Leadership*. New York: Harper & Row.

Buschlen, E., & Dvorak, R. (2011). The social change model as pedagogy: Examining undergraduate leadership growth. *Journal of Leadership Education*, *10*(2), 38–56.

Campbell, C. M., Smith, M., Dugan, J. P., & Komives, S. R. (2012). Mentors and college student leadership outcomes: The importance of position and process. *The Review of Higher Education*, *35*(4), 595–625. doi:10.1353/rhe.2012.0037

Carnevale, A. P., & Cheah, B. (2013). *Hard times: College majors, unemployment and earnings*. Washington, D.C.: Georgetown University Public Policy Institute.

Carnevale, A. P., Smith, N., Melton, M., & Price, E. W. (2015). *Learning while earning: The new normal*. Washington, D.C. doi:10.1017/CBO9781107415324.004

Cattell, R. B. (1966). The scree test for number of factors. *Multivariate Behavioral Research, 1*, 245-276.

Caza, A., & Rosch, D. M. (2014). An exploratory examination of students' pre-existing beliefs about leadership. *Studies in Higher Education*, *39*(9), 1586–1598. doi:10.1080/03075079.2013.801434

Chavez, D., & Mulugetta, Y. (1994). National student employment survey: A review of why students choose to work and students' overall perceptions of the academic year work experiences. *Journal of Student Employment, 6*(1).

Cheng, D. X., & Alcántara, L. (2007). Assessing working students' college experiences: A grounded theory approach. *Assessment & Evaluation in Higher Education*, *32*(3), 301–311. doi:10.1080/02602930600896639

Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE Bulletin*, *3*, 2–6.

Chickering, A. W., Frank, I, & Robinson, V. (1996). Encouraging student development through student employment. In R. Kincaid, (Ed.), *Student employment: Linking college and the workplace* (pp. 11-24). Columbia, SC: National Resource Center for The Freshman Year Experience and Students in Transition.

Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*(1), 155.

Cohen, M. D. & March, J. G. (1986/2010). Leadership in an organized anarchy. In Brown, M. C. (Ed.). *Organization and governance in higher education, sixth edition.* New York: Pearson Learning Solutions.

College Board. (2015a). *Trends in college pricing 2015*. Washington, D.C.: Author.

College Board. (2015b). *Trends in student aid 2015*. Washington, D.C.: Author.

Cooperative Education & Internship Association (n.d.). *History of cooperative education and internships*. Retrieved from http://www.ceiainc.org/about/history.

Council for the Advancement of Standards in Higher Education. (2015). *CAS professional standards for higher education, 9th edition*. Washington, D.C.: Author.

Cress, C. M., Astin, H. S., Zimmerman-Oster, K., & Burkhardt, J. C. (2001). Developmental outcomes of college students' involvement in leadership activities. *Journal of College Student Development*, *42*(1), 15–27.

Cruce, T. M., & Moore, J. V., III. (2006, May). *First-year students' plans to volunteer: An examination of the predictors of community service participation*. Paper presented at the annual forum for the Association for Institutional Research, Chicago, IL.

Darolia, R. (2014). Working (and studying) day and night: Heterogeneous effects of working on the academic performance of full-time and part-time students. *Economics of Education Review*, *38*, 38–50. doi:10.1016/j.econedurev.2013.10.004

Delen, D., & Crossland, M. D. (2008). Seeding the survey and analysis of research literature with text mining. *Expert Systems with Applications*, *34*(3), 1707–1720. http://doi.org/10.1016/j.eswa.2007.01.035

DeSimone, J. (2008). *The impact of employment during school on college student academic performance* (No. 14006). Washington, D.C.: National Bureau of Economic Research.

Dugan, J. P. (2006). Explorations using the social change model: Leadership development among college men and women. *Journal of College Student Development*, *47*(2), 217–225. doi:10.1353/csd.2006.0015

Dugan, J. P. (2008a). Involvement in student clubs and organizations matters. *Concepts & Connections: A Publication for Leadership Educators*, *15*(4).

Dugan, J. P. (2008b). Exploring relationships between fraternity and sorority membership and socially responsible leadership. *Oracle: The Research Journal of the Association of Fraternity/Sorority Advisors*, *3*(2), 16–25.

Dugan, J. P. (2011). Research on college student leadership development. In Komives, Dugan, Owen, Slack, Wagner, and Associates (Eds.) *The handbook for student leadership development*. San Francisco: Jossey-Bass.

Dugan, J. P. (2013). Patterns in group involvement experiences during college: Identifying a taxonomy. *Journal of College Student Development*, *54*(3), 229–246. doi:10.1353/csd.2013.0028

Dugan, J. P. (2015). The measurement of socially responsible leadership: Considerations in establishing psychometric rigor. *Journal of Educational, Cultural and Psychological Studies (ECPS Journal)*, *1*(12), 23–42. doi:10.7358/ecps-2015-012-duga

Dugan, J. P., Bohle, C. W., Gebhardt, M., Hofert, M., Wilk, E., & Cooney, M. A. (2011). Influences of leadership program participation on students' capacities for socially responsible leadership. *Journal of Student Affairs Research and Practice*, *48*(1), 65–84. doi:10.2202/1949-6605.6206

Dugan, J. P., Bohle, C. W., Woelker, L. R., & Cooney, M. A. (2014). The role of social perspective-taking in developing students' leadership capacities. *Journal of Student Affairs Research and Practice*, *51*(1), 1–15. http://doi.org/10.1515/jsarp-2014-0001

Dugan, J. P., Fath, K. Q., Howes, S. D., Lavelle, K. R., & Polanin, J. R. (2013). Developing the leadership capacity and leader efficacy of college women in science, technology, engineering, and math fields. *Journal of Leadership Studies*, *7*(3), 6–24. doi:10.1002/jls

Dugan, J. P., Garland, J. L., Jacoby, B., & Gasiorski, A. (2008). Self-Efficacy for Leadership: A Within-Group Analysis. *NASPA Journal*, *45*(2), 282–311.

Dugan, J. P., Kodama, C. M., & Gebhardt, M. C. (2012). Race and leadership development among college students: The additive value of collective racial esteem. *Journal of Diversity in Higher Education*, *5*(3), 174–189. doi:10.1037/a0029133

Dugan, J. P., & Komives, S. R. (2007). *Developing leadership capacity in college students: Findings from a national study. A report from the Multi-Institutional Study of Leadership*. Retrieved from http://mslreviewteam.wiki.usfca.edu/file/view/MSLReport+06.pdf

Dugan, J. P., & Komives, S. R. (2010). Influences on college students' capacities for socially responsible leadership. *Journal of College Student Development*, *51*(5), 525–549. doi:10.1353/csd.2010.0009

Dugan, J. P., & Komives, S. R. (2011). Leadership theories. In Komives, Dugan, Owen, Slack, Wagner, and Associates (Eds.) *The handbook for student leadership development*. San Francisco: Jossey-Bass.

Dugan, J. P., Komives, S. R., & Segar, T. C. (2008). College student capacity for socially responsible leadership: Understanding norms and influences of race, gender, and sexual orientation. *Journal of Student Affairs Research and Practice*, *45*(4), 475–500. doi:10.2202/1949-6605.2008

Dugan, J. P., Rossetti Morosini, A. M., & Beazley, M. R. (2011). Cultural transferability of socially responsible leadership: Findings from the United States and Mexico. *Journal of College Student Development*, *52*(4), 456–474. doi:10.1353/csd.2011.0052

Dugan, J. P., Torrez, M. A., & Turman, N. T. (2014). *Leadership in intramural sports and club sports: Examining influences to enhance educational impact*. Corvallis, OR.: NIRSA.

Durham Hynes, S. L. (2010). *Perceptions of the capacity for change as a component of leadership development as reported by select populations of college students: Implications*

for college student leadership development. (Doctoral dissertation). Retrieved from Dissertation Abstracts International. (UMI No. 3370691).

Eagan, K., Stolzenberg, E. B., Ramirez, J. J., Aragon, M. C., Suchard, M. R., & Rios-Aguilar, C. (2016). *The American freshman: Fifty-year trends, 1966-2015*. Los Angeles: Higher Education Research Institute, UCLA.

Eagan, M. K., Stolzenberg, E. B., Zimmerman, H. B., Aragon, M. C., Whang Sayson, H., & Rios-Aguilar, C. (2017). *The American freshman: National norms fall 2016*. Los Angeles: Higher Education Research Institute, UCLA.

Eagly, A. H., Johannesen-Schmidt, M. C., & van Engen, M. L. (2003). Transformational, transactional, and laissez-faire leadership styles: A meta-analysis comparing women and men. *Psychological Bulletin*, *129*(4), 569–591. doi:10.1037/0033-2909.129.4.569

Early, S. L. (2014). *An examination of mentoring relationships and leadership capacity in resident assistants*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database.

Ehrenberg, R. G., & Sherman, D. R. (1987). Employment while in college, academic achievement, and postcollege outcomes: A summary of results. *The Journal of Human Resources*, *22*(1), 1–23. doi:10.2307/145864

Empie, M. J. (2012). *How graduates make meaning of their on-campus employment: A retrospective view*. (Doctoral dissertation). Retrieved from Graduate Theses and Dissertations. (Paper 12320).

Enders, C. K. (2010). *Applied missing data analysis*. New York: The Guilford Press.

Eraut, M. (2007). Learning from other people in the workplace. *Oxford Review of Education*, *33*(4), 403–422. http://doi.org/10.1080/03054980701425706

Feldman, R. & Sanger, J. (2007). *The text mining handbook: Advanced approaches in analyzing unstructured data*. New York: Cambridge University Press.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics, fourth edition*. London: Sage.

Furr, S. and Elling, T. W. (2000). The influence of work on college student development. *NASPA Journal*, *2*(37), 454–470.

Gasiorski, A. L. (2009). *Who serves in college?: Exploring the relationship between background, college environments, and college community service participation*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database.

Gergen, K. J. (1991). *The Saturated Self: Dilemmas of Identity in Contemporary Life*. Basic Books.

Gleason, M. C. (2012). *Mentoring influence on socially responsible leadership capacity based on institutional Carnegie Classification*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3511394).

Gleason, P. M. (1993). College student employment, academic progress, and postcollege labor market success. *Journal of Student Financial Aid*, *23*(2), 5–14.

Goldrick-Rab, S. (2016, September 2). What colleges can do right now to help low-incoming students succeed. *The Chronicle of Higher Education*, p. A116.

Greenleaf, R. K. (1977). *Servant leadership*. New York, NY: Paulist Press.

Guba, E. G., & Lincoln, Y. S. (1993). Competing paradigms in qualitative research. In C. F. Conrad, J. G. Haworth, L. R. Laffuca, & J. L. Ratcliff (Eds.), *Qualitative Research in Higher Education: Expanding Perspectives* (pp. 57–72).

Guthrie, K. L., Jones, T. B., Osteen, L., & Hu, S. (2013). Cultivating leader identity and capacity. *ASHE Higher Education Report*, *39*, 1–124. doi:10.1002/aehe.20010

Haber, P. (2011). *Perceptions of leadership: An analysis of college students' understandings of the concept of leadership*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3475604).

Haber, P. (2012). Perceptions of leadership: An examination of college students' understandings of the concept of leadership. *Journal of Leadership Education*, *11*(2), 26–51. doi:10.1017/CBO9781107415324.004

Hall, S. L., Forrester, S., & Borsz, M. (2008). A constructivist case study examining the leadership development of undergraduate students in campus recreational sports. *Journal of College Student Development*, *49*(2), 125–140. doi:10.1353/csd.2008.0010

Hammes, J. F., & Haller, E. J. (1983). Making ends meet: Some of the consequences of part-time work for college students. *Journal of College Student Personnel*, *24*(6), 529–535.

Hannah, S. T., Avolio, B. J., Luthans, F., & Harms, P. D. (2008). Leadership efficacy: Review and future directions. *Leadership Quarterly*, *19*(6), 669–692. doi:10.1016/j.leaqua.2008.09.007

Hargrove, W. R. (1952). Leadership as an idea. *Peabody Journal of Education*, *30*(2), 75–78. http://doi.org/10.1080/01619565209536394

Hay, J. E., & Lindsay, C. A. (1969). The working student: How does he achieve? *Journal of College Student Personnel*, *10*(2), 109–114.

He, W. (2013). Examining students' online interaction in a live video streaming environment using data mining and text mining. *Computers in Human Behavior*, *29*(1), 90–102. http://doi.org/10.1016/j.chb.2012.07.020

Heifetz, R. A. (1994). *Leadership without easy answers*. Cambridge, MA: Harvard University Press.

Henry, J. B. (1967). Part-time employment and academic performance. *Journal of College Student Personnel*, *8*(4), 257–260.

Hevel, M. S., Martin, G. L., & Pascarella, E. T. (2014). Do fraternities and sororities still enhance socially responsible leadership? Evidence from the fourth year of college. *Journal of Student Affairs Research and Practice*, *51*(3), 233–245. doi:10.1515/jsarp-2014-0025

Higher Education Research Institute. (1996). *A social change model of leadership development: Guidebook version III*. College Park, MD: National Clearinghouse for Leadership Programs.

Hogendorp, M. B. (2012). *The relationship of student involvement in political organizations to self-reported capacities for socially responsible leadership*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3571157)

Horn, L. J., & Malizio, A. G. (1996). *Undergraduates who work: National postsecondary student aid study, 1996*. National Center for Education Statistics. Washington, D.C.: U.S. Department of Education.

Howard, G. S., & Dailey, P. R. (1979). Response-shift bias: A source of contamination of self-report measures. *Journal of Applied Psychology*, *64*(2), 144–150. http://doi.org/10.1037/0021-9010.64.2.144

Ignatow, G., & Mihalcea, R. (2017). *Text Mining: A Guidebook for the Social Sciences*. Thousand Oaks, CA: SAGE.

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement, 20*, 141-151.

Kalenkoski, C. M., & Pabilonia, S. W. (2010). Parental transfers, student achievement, and the labor supply of college students. *Journal of Population Economics*, *23*(2), 469–496. http://doi.org/10.1007/s00148-008-0221-8

Keating, K., Rosch, D. M., & Burgoon, L. (2014). Developmental readiness for leadership: The differential effects of leadership courses on creating "ready, willing, and able" leaders. *Journal of Leadership Education*, *13*(3), 1–16. doi:1012806/V13/I3/R1

Keeling, R. P. (Ed.) (2006). *Learning reconsidered 2: Implementing a campus-wide focus on the student experience.* Washington, DC: American College Personnel Association, National Association of Student Personnel Administrators.

Kegan, R. (1994). *In over our heads: The mental demands of modern life*. Cambridge, MA: Harvard University Press.

Keith, T. Z. (2015). *Multiple regression and beyond: An introduction to multiple regression and structural equation modeling, second edition*. New York: Routledge.

Kena, G., Hussar, W., McFarland, J., de Brey, C., Musu-Gillette, L., Wang, X., Zhang, J., Rathbun, A., Wilkinson-Flicker, S., Diliberti, M., Barmer, A., Bullock Mann, F., & Dunlop Velez, E. (2016). *The condition of education 2016*. NCES 2016-144. Washington, D.C.: National Center for Education Statistics.

Ketchum-Ciftci, L. R. (2004). *Student employment factors that contribute to the acquisition of educational outcomes*. (Doctoral dissertation). Retrieved from Dissertation Abstracts International. (UMI No. 3128065).

Kezar, A. J., Carducci, R., & Contreras-McGavin, M. (2006). Rethinking the "L" word in higher education: The revolution of research on leadership. *ASHE Higher Education Report*, *31*(6), 1–218. doi:10.1002/aehe.3106

Kincaid, R. (Ed.). (1996). *Student employment: Linking college and the workplace.* Columbia, SC: National Resource Center for The Freshman Year Experience and Students in Transition.

King, T., & Bannon, E. (2002). *At what cost? The price that working students pay for a college education*. Washington, D.C.: The State PIRGs' Higher Education Project.

Kodama, C. M., & Dugan, J. P. (2013). Leveraging leadership efficacy for college students: Disaggregating data to examine unique predictors by race. *Equity & Excellence in Education*, *46*(2), 184–201. doi:10.1080/10665684.2013.780646

Komives, S. R. (1994). Women student leaders: Self-perceptions of empowering leadership and achieving style. *NASPA Journal*, *31*(2), 102–112.

Komives, S. R. (2011). Advancing leadership education. In Komives, Dugan, Owen, Slack, Wagner, and Associates (Eds.) *The handbook for student leadership development*. San Francisco: Jossey-Bass.

Komives, S. R., Dugan, J. P., & Segar, T. C. (2006). The multi-institutional study of leadership: Understanding the project. *Concepts & Connections: A Publication for Leadership Educators*, *15*(1).

Komives, S. R., & Johnson, M. (2009). The role of high school experience in college student leadership development. *Educational Considerations*, *37*(1), 30–39.

Komives, S. R., Longerbeam, S., Owen, J., Mainella, F. C., & Osteen, L. (2006). A leadership identity development model: Applications from a grounded theory. *Journal of College Student Development*, *47*(4), 401–418. doi:10.1353/csd.2006.0048

Komives, S. R., Lucas, N., & McMahon, T. R. (1998/2013). *Exploring leadership: For college students who want to make a difference*, *third edition*. San Francisco: Jossey-Bass.

Komives, S. R., Owen, J. E., Longerbeam, S. D., Mainella, F. C., & Osteen, L. (2005). Developing a leadership identity: A grounded theory. *Journal of College Student Development*, *46*(6), 593–611. doi:10.1353/csd.2005.0061

Komives, S. R., Wagner, W., & Associates. (2009). *Leadership for a better world*. San Francisco: Jossey-Bass.

Kouzes, J., & Posner, B. (1987/2012). *The leadership challenge: How to make extraordinary things happen, fifth edition*. Atlanta, GA: Better World Books.

Kuh, G. D. (2008). *High-impact educational practices: What they are, who has access to them, and why they matter*. Washington, DC: Association of American Colleges and Universities.

Kuh, G. D., Jankowski, N., Ikenberry, S. O., & Kinzie, J. (2014). *Knowing what students know and can do: The current state of student learning outcomes assessment in U.S. colleges and universities*. Champaign, IL. Retrieved from learningoutcomesassessment.org

Lewis, J. S. (2010). Job fare: Workplace experiences that help students learn. In L. W. Perna (Ed.), *Understanding the working college student: New research and its implications for policy and practice*. (pp. 155-176). Sterling, VA: Stylus.

Lewis, J. S. & Contreras, S. (2009). Student learning outcomes: Empirical research as the bridge between theory and practice. In B. Perozzi (Ed.), *Enhancing Student Learning Through College Employment*. Bloomington, IN: Association of College Unions International.

Logue, C. T., Hutchens, T. A., & Hector, M. A. (2005). Student leadership: A phenomenological exploration of postsecondary experiences. *Journal of College Student Development*, *46*(4), 393–408. doi:10.1353/csd.2005.0039

Lundberg, C. A. (2004). Working and learning: The role of involvement for employed students. *NASPA Journal*, *41*(2), 201–215. doi:10.2202/1949-6605.1330

McCormick, A. C., Moore, J. V. III, & Kuh. G. D. (2010). Working during college: Its relationship to student engagement and education outcomes. In L. W. Perna (Ed.) *Understanding the working college student: New research and its implications for policy and practice*. (pp. 179-212). Sterling, VA: Stylus.

Martin, G. L. (2013). Measuring the impact of student interaction with student affairs professionals on socially responsible leadership development in the first year of college. *Journal of College and Character*, *14*(4), 319–329. doi:10.1515/jcc-2013-0041

Martin, G. L., Hevel, M. S., & Pascarella, E. T. (2012). Do fraternities and sororities enhance socially responsible leadership? *Journal of Student Affairs Research and Practice*, *49*(3), 267–284. doi:10.1515/jsarp-2012-6245

Mayhew, M. J., Rockenbach, A. N., Bowman, N. A., Seifert, T. A., Wolniak, G. C., Pascarella, E. T., & Terenzini, P. T. (2016). *How college affects students (Vol. 3): 21st century evidence that higher education works*. San Francisco: Jossey-Bass.

Merriam-Webster (2017). *Ability*. Retrieved from https://www.merriam-webster.com/dictionary/ability.

Miller, M. A. (2008). The voluntary system of accountability: origins and purposes: An interview with George Mehaffy and David Shulenberger. *Change: The Magazine of Higher Learning*, *40*(4), 8–13. doi:10.3200/CHNG.40.4.8-13

Miner, G., Delen, D., Elder, J., Fast, A., Hill, T., & Nisbet, R. A. (2012). *Practical text mining and statistical analysis for non-structured text data applications*. Waltham, MA: Academic Press.

Mintzberg, H. (1979). The professional bureaucracy. *Organization and governance in higher education*, 50-70.

Multi-Institutional Study of Leadership (2015). *MSL 2015 Codebook, Master Version*. Chicago, IL: Author.

Multi-Institutional Study of Leadership. (2016a). *About MSL: History*. Retrieved from http://www.leadershipstudy.net/about.

Multi-Institutional Study of Leadership. (2016b). *Design: Instrument & Psychometrics*. Retrieved from http://www.leadershipstudy.net/design.

Mulugetta, Y., & Chavez, D. (1996). National student employment survey: A review of why students choose to work and students' overall perceptions of the academic work experience. In R. Kincaid, (Ed.), *Student employment: Linking college and the workplace* (pp. 43-56). Columbia, SC: National Resource Center for The Freshman Year Experience and Students in Transition.

National Association of Student Personnel Administrators & American College Personnel Association (2004). *Learning reconsidered: A campus-wide focus on the student experience.* Washington, DC: Author.

New England Association of Schools and Colleges (2016). *Standards for accreditation.* Burlington, MA: Commission on Institutions of Higher Education.

Northouse, P. G. (2016). *Leadership: Theory and practice, seventh edition*. Thousand Oaks, CA: Sage.

Nuñez, A-M. & Sansone, V. A. (2016). Earning and learning: Exploring the meaning of work in the experiences of first-generation Latino college students. *The Review of Higher Education, 40*(1), 91-116.

Ospina, S., & Su, C. (2009). Weaving Color Lines: Race, Ethnicity, and the Work of Leadership in Social Change Organizations. *Leadership*, *5*(2), 131–170. http://doi.org/10.1177/1742715009102927

Owen, J. E. (2008). *Towards an empirical typology of collegiate leadership development programs: Examining effects on student self-efficacy and leadership for social change*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (UMI No. 3324779).

Padgett, R. D., & Grady, D. L. (2009). *Student development and personal growth in employment.* In B. Perozzi (Ed.), Enhancing student learning through college employment (pp. 31-43). Bloomington, IN: Association of College Unions International.

Pascarella, E. T. & Blaich, C. (2013). Lessons from the Wabash National Study of Liberal Arts Education. *Change: The Magazine of Higher Learning, 45*(2), 6-15.

Pascarella, E. T., Bohr, L., Nora, A., Desler, M., & Zusman, B. (1994). Impacts of on-campus and off-campus work on first year cognitive outcomes. *Journal of College Student Development*, *35*, 364–370.

Pascarella, E. T., Edison, M. I., Nora, A., Hagedorn, L. S., and Terenzini, P. T. (1998). Does work inhibit cognitive development during college? *Educational Evaluation and Policy Analysis*, *20*(2), 75–93.

Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students*. San Francisco: Jossey-Bass.

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students (Vol. 2): A third decade of research.* San Francisco: Jossey-Bass.

Paslov, J. & Skomsvold, P. (2014). *Student financing of undergraduate education: 2011-12 web tables*. NCES 2015-173. Washington, D.C.: National Center for Education Statistics.

Perna, L. W. (2010). *Understanding the working college student: New research and its implications for policy and practice*. Sterling, VA: Stylus.

Perna, L. W., Cooper, M. A., & Li, C. (2006). Improving educational opportunities for students who work (Research paper). Indiana Project on Academic Success. Retrieved September 23, 2016 from http://www.indiana.edu/~ipas1/Perna%20Improving%20Educational%20Opportunities.pdf

Pike, G. R., Kuh, G. D., & Massa-McKinley, R. (2008). First-year students' employment, engagement, and academic achievement: Untangling the relationship between work and grades. *NASPA Journal*, *45*(4), 560–583.

Porter, S. R. (2011). Do college student surveys have any validity? *The Review of Higher Education, 35*(1), 45–76. http://doi.org/10.1353/rhe.2011.0034

Posner, B. Z. (2009). A longitudinal study examining changes in students' leadership behavior. *Journal of College Student Development*, *50*(5), 551–563. doi:10.1353/csd.0.0091

Posner, B. Z., & Brodsky, B. (1992). A leadership development instrument for college students. *Journal of College Student Development, 33*, 231-237.

Posner, B. Z., & Brodsky, B. (1994). Leadership practices of effective student leaders: Gender makes no difference. *NASPA Journal*, *31*(2), 113–120.

Proctor, B. D., Semega, J. L., & Kollar, M. A. (2016). *Income and poverty in the United States: 2015*. Washington, D.C.: United States Census Bureau.

Provalis Research (2015). *WordStat 7 user's guide*. Montreal: Author. Retrieved from https://provalisresearch.com/resources/manuals-2/

Renn, K. A., & Ozaki, C. C. (2010). Psychosocial and leadership identities among leaders of identity-based campus organizations. *Journal of Diversity in Higher Education*, *3*(1), 14–26. doi:10.1037/a0018564

Riggert, S. C., Boyle, M., Petrosko, J. M., Ash, D., & Rude-Parkins, C. (2006). Student employment and higher education: Empiricism and contradiction. *Review of Educational Research*, *76*(1), 63–92. doi:10.3102/00346543076001063

Rohs, F. R. (2002). Improving the evaluation of leadership programs: Control response shift. *Journal of Leadership Education*, *1*(2), 50–61. Retrieved from http://www.fhsu.edu/JOLE/issues/JOLE_1_2.pdf#page=54

Rohs, F. R., & Langone, C. A. (1997). Increased accuracy in measuring leadership impacts. *The Journal of Leadership Studies*, *4*(1), 150–158.

Romero, C., & Ventura, S. (2007). Educational data mining: A survey from 1995 to 2005. *Expert Systems with Applications*, *33*(1), 135–146. http://doi.org/10.1016/j.eswa.2006.04.005

Rosch, D. M., & Caza, A. (2012). The durable effects of short-term programs on student leadership development. *Journal of Leadership Education*, *11*(1), 28–48. doi:10.12806/V11/I1/RF2

Rosch, D. M., Boyd, B. L., & Duran, K. M. (2014). Students' self-identified long-term leadership development goals: An analysis by gender and race. *Journal of Leadership Education*, *13*(3), 17–33. doi:1012806/V13/I3/R2

Rost, J. C. (1991). *Leadership for the twenty-first century*. Westport, CT: Praeger.

Ryan, G. W., & Bernard, H. R. (2003). Techniques to identify themes. *Field Methods*, *15*(1), 85–109. http://doi.org/10.1177/1525822X02239569

Salisbury, M. H., Padgett, R. D., & Pascarella, E. T. (2009). The effects of work on the educational experiences and liberal acts outcomes of first year college students. *Annual Meeting of the Association for Institutional Research*, (319), 1–59.

Salisbury, M. H., Pascarella, E. T., Padgett, R. D., & Blaich, C. (2012). The effects of work on leadership development among first-year college students. *Journal of College Student Development*, *53*(2), 300–324. doi:10.1353/csd.2012.0021

San, G. (1986). The early labor force experience of college students and their post-college success. *Economics of Education Review*, *5*(1), 65–76. http://doi.org/10.1016/0272-7757(86)90164-0

Savoca, M. (2016). *Campus employment as a high impact practice: Relationship to academic success and persistence of first-generation college students*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (ProQuest No. 10138001)

Schuh, J. H., & Laverty, M. (1983). The perceived long-term influence of holding a significant student leadership position. *Journal of College Student Personnel*, *24*(1), 28–32.

Scott-Clayton, J. (2011). The causal effect of federal work-study participation: Quasi-experimental evidence from West Virginia. *Educational Evaluation and Policy Analysis*, *33*(4), 506–527. doi:10.3102/0162373711421211

Scott-Clayton, J., & Minaya, V. (2015). Should student employment be subsidized? Conditional counterfactuals and the outcomes of work-study participation. *Economics of Education Review*, *52*, 1–18. doi:10.3386/w20329

Shalka, T. R., & Jones, S. R. (2010). Differences in self-awareness related measures along culturally based fraternity, social fraternity, and non-affiliated college men. *Oracle: The Research Journal of the Association of Fraternity/Sorority Advisors*, *5*, 1–11.

Sharp, M. D., Komives, S. R., & Fincher, J. (2011). Learning outcomes in academic disciplines: Identifying common ground. *Journal of Student Affairs Research and Practice*, *48*(4), 37–41. doi:10.2202/1949-6605.6246

Shertzer, J. E., & Schuh, J. H. (2004). College student perceptions of leadership: Empowering and constraining beliefs. *NASPA Journal*, *42*(1), 111–132.

Sidanius, J., Levin, S., Van Laar, C., & Sears, D. O. (2008). *The diversity challenge: Social identity and intergroup relations on the college campus*. New York: Russell Sage Foundation.

Skomsvold, P. (2014). *Profile of undergraduate students: 2011-12 web tables*. NCES 2015-167. Washington, D.C.: National Center for Education Statistics.

Slaughter, S. & Rhoades, G. (2011). Markets in higher education: Trends in academic capitalism. In Altbach, P. G., Gumport, P. J. & Berdahl, R. O. (Eds.) *American higher education in the twenty-first century: Social, political, and economic challenges, third edition*. Baltimore, MD: Johns Hopkins University Press.

Snyder, T. D., de Brey, C. & Dillow, S. A. (2016). *Digest of education statistics, 2014*. NCES 2016-006. Washington, D.C.: National Center for Education Statistics.

Stephens, C. M., & Rosch, D. M. (2015). Building leaders: A national examination of the leadership capacities within engineering undergraduate students. *International Journal of Engineering Education*, *31*(4), 986–997.

Stephenson, Jr., S. P. (1982). Work in college and subsequent wage rates. *Research in Higher Education*, *17*(2), 165–178. http://doi.org/10.1007/BF00973717

Stern, D., & Nakata, Y. (1991). Paid employment among U.S. college students: Trends, effects, and possible causes. *The Journal of Higher Education*, *62*(1), 25–43. doi:10.2307/1982099

Stinebrickner, R., & Stinebrickner, T. R. (2003). Working during School and Academic Performance. *Journal of Labor Economics*, *21*(2), 473–491. http://doi.org/10.1086/345565

Stone P. J., Dunphy, D. C., & Smith, M. S. (1966). The general inquirer: A computer approach to content analysis. Oxford, England: M.I.T. Press.

Tabachnick, B. G. & Fidell, L. S. (2007). *Using multivariate statistics, fifth edition*. Boston: Pearson.

Thomas, S. L., & Heck, R. H. (2001). Analysis of large-scale secondary data in higher education research: Potential perils associated with complex sampling designs. *Research in Higher Education*, *42*(5), 517-540.

Tinto, V. (1993). *Leaving college: rethinking the causes and cures of student attrition*. Chicago, IL: University of Chicago Press.

Troppe, P. (2000). *The national study of the operation of the federal work-study program: Summary findings from the student and institutional surveys*. Washington, D.C.: U.S. Department of Education.

Triventi, M. (2014). Does working during higher education affect students' academic progression? *Economics of Education Review*, *41*, 1–13. http://doi.org/10.1016/j.econedurev.2014.03.006

Tyree, T. M. (1998). Designing an instrument to measure socially responsible leadership using the social change model of leadership development (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 9836493)

U.S. Department of Education. (2006). *A test of leadership: Charting the future of US higher education*. US Department of Education. Retrieved from http://www2.ed.gov/about/bdscomm/list/hiedfuture/reports/final-report.pdf

Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *Leadership Quarterly*, *18*(4), 298–318. doi:10.1016/j.leaqua.2007.04.002

Van de Water, G., & Augenblick, J. (1987). *Working while studying: Does it matter? An examination of the Washington State work study program*.

Watson, S. T. (2013). *Student employment in student affairs units: Characteristics of educationally purposeful environments*. (Doctoral dissertation). Retrieved from Dissertation Abstracts International.

Weick, K. E. (1976). Educational organizations as loosely coupled systems. *Administrative Science Quarterly, 21*(1), 1-19.

Whitt, E. J. (1994). "I can be anything!" Student leadership in three women's colleges. *Journal of College Student Development*, *35*(3), 198–207.

Wielkiewicz, R. M. (2000). The leadership attitudes and beliefs scale: An instrument for evaluating college students' thinking about leadership and organizations. *Journal of College Student Development*, *41*(3), 335–347.

Wilson, W. L. (2009). *Examining factors associated with leadership self-efficacy in college student military programs*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3359432)

Zemsky, R. (2009). *Making reform work: The case for transforming American higher education*. Rutgers University Press.

Zilvinskis, J. (2015, May). *Mining text data for useful information in higher education*. Paper presented at the annual forum for the Association for Institutional Research, Denver, CO.

Appendix

Table A.1. Variables included in propensity score

Variable Name	Variable Category
Male	Demographics
Trans	Demographics
African American	Demographics
Asian American	Demographics
Latinx	Demographics
Multiracial	Demographics
All other races	Demographics
Disability	Demographics
LGBQ	Demographics
International student	Demographics
Military affiliation	Demographics
Enrolled part-time	Demographics
First Year	Demographics
Sophomore	Demographics
Junior	Demographics
First Generation	Demographics
Parents' income $25-55,000	Demographics
Parents' income $55-100,000	Demographics
Parents' income above $100,000	Demographics
Parents' income no response	Demographics
Pre-test for leadership capacity	Retrospective scales
Pre-test for leadership self-efficacy	Retrospective scales
HS clubs and organizations	Retrospective scales
HS organized sports	Retrospective scales
HS leadership positions	Retrospective scales
Precollege community service	Retrospective scales
Precollege community or work-related organizations	Retrospective scales
Precollege community leadership positions	Retrospective scales
Precollege social change activities	Retrospective scales
Precollege leadership training	Retrospective scales

Table A.2. Descriptive statistics for all variables

Variable Label	Var. Name	N	Min.	Max.	Mean	SD
Work status and hours						
Working off-campus only	WK_OFF	35829	0	1	.1068	.30892
Working on-campus only	WK_ON	35829	0	1	.3020	.45914
Working both on- and off-campus only	WK_BOTH	35829	0	1	.0383	.19197
Total hours worked on- and off-campus	TOTAL_HR	35822	0	88	5.3677	8.11151
On-campus workplace locations						
Academics and research	ACADEMIC	35829	0	1	.0839	.27720
Academic support	ACAD_SPT	35829	0	1	.0224	.14793
Admissions and financial aid	ADM_FINA	35829	0	1	.0168	.12843
Administration	ADMIN	35829	0	1	.0357	.18561
Alumni and development	ALUM_DEV	35829	0	1	.0098	.09849
Athletics, recreation, health, and wellness	ATH_REC	35829	0	1	.0399	.19569
Auxiliary service	AUX	35829	0	1	.0058	.07597
Food services	FOOD	35829	0	1	.0210	.14335
IT, Technology, and Media Services	IT_TECH	35829	0	1	.0099	.09918
Library	LIBRARY	35829	0	1	.0143	.11869
Public safety	PUB_SFTY	35829	0	1	.0034	.05825
Residence life and housing	RES_LIFE	35829	0	1	.0412	.19868
Spiritual life	SPRT_LIF	35829	0	1	.0040	.06283
Student affairs	STU_AFF	35829	0	1	.0314	.17432
Demographic variables						
Male	MALE	35829	0	1	.3477	.47623
Trans	TRANS	35829	0	1	.0045	.06668
African American/Black	AF_AM	35829	0	1	.0508	.21959
Latino/Hispanic	LATINX	35829	0	1	.0732	.26053
Asian American	AS_AM	35829	0	1	.0447	.20661
Multiracial	MULTIRAC	35829	0	1	.1007	.30090
All other races	RACE_OTH	35829	0	1	.0310	.17327
Self-identified disability	DISABILI	35829	0	1	.1030	.30399
LGB, Queer, and Questioning	INTL	35829	0	1	.0847	.27837
International students	LGBQ	35829	0	1	.0365	.18748
Past or current military affiliated	MILITARY	35829	0	1	.0095	.09695
Enrollment status less than full-time	PT_TIME	35829	0	1	.0047	.06852
First Years	FIRST_YR	35829	0	1	.4114	.49209
Sophomores	SOPHOMOR	35829	0	1	.2774	.44774
Juniors	JUNIOR	35829	0	1	.1781	.38260

Table A.2 continued. Descriptive statistics for all variables

Variable Label	Var. Name	N	Min.	Max.	Mean	SD
First Generation	FIRST_GEN	35829	0	1	.1078	.31015
Parents' income between $25,000-$55,000	INC_25_55	35829	0	1	.1182	.32285
Parents' income between $55,000-$100,000	INC_55_100	35829	0	1	.2140	.41016
Parents' income above $100,000	INC_ABV	35829	0	1	.3726	.48350
Parents' income don't know or rather not say	INC_NR	35829	0	1	.2385	.42615
Retrospective scales						
Pre-test for leadership capacity scale	PRESRLS	35803	1	25	15.6959	3.96397
Pre-test for leadership efficacy scale	PREEFF	35811	1	4	2.8275	.70631
HS clubs and orgs	PRE3A	35827	0	3	2.11	1.016
HS organized sports	PRE3B	35824	0	3	1.89	1.241
HS club/sports leadership positions	PRE3C	35823	0	3	1.89	1.126
Pre-college community service	PRE4A	35821	0	3	1.78	.900
Pre-college community or work-related orgs	PRE4C	35824	0	3	1.54	1.066
Pre-college leadership positions in community or work-related orgs	PRE4D	35820	0	3	.99	1.073
Pre-college worked with others for change to address societal problems	PRE4F	35824	0	3	.69	.875
Pre-college training or education that developed leadership skills	PRE4G	35823	0	3	1.26	.972
College environmental experiences						
GPA	GPA	35824	1	6	1.78	.879
Community service participation	ENV3	35827	0	1	.45	.498
Study abroad participation	ENV4A	35731	0	1	.14	.348
Practicum, internship, field experience, co-op experience, or clinical experience	ENV4B	35740	0	1	.33	.470
Learning community or other formal program where groups of students take two or more classes together	ENV4C	35735	0	1	.25	.431

Table A.2 continued. Descriptive statistics for all variables

Variable Label	Var. Name	N	Min.	Max.	Mean	SD
Participated in a living-learning program	ENV4D	35726	0	1	.19	.394
Research with faculty outside of class	ENV4E	35719	0	1	.14	.351
First-year or freshman seminar course	ENV4F	35791	0	1	.69	.464
Culminating senior experience	ENV4G	35718	0	1	.10	.306
Social Change Behaviors scale	OUTSCB	35782	0	3	1.0923	.75484
Been an involved member in college organizations	ENV6A	35823	0	4	2.45	1.311
Held a leadership position in a college organization(s)	ENV6B	35823	0	4	1.23	1.519
Been an involved member in an off-campus community or work-based organization(s) unaffiliated with institution	ENV6C	35825	0	4	.76	1.213
Held a leadership position in an off-campus community or work-based organization(s) unaffiliated with institution	ENV6D	35821	0	4	.42	.969
Served as a resident assistant	ENV7J	35820	0	1	.08	.266
Socio-Cultural Conversations scale	SOCCUL	35810	0	3	1.6847	.75415
Participated in a leadership training or leadership education experience of any kind	ENV10	35826	0	1	.33	.469
Participated in a leadership conference	ENV10A1	35829	0	1	.19	.393
Participated in a leadership retreat	ENV10A2	35829	0	1	.16	.362
Participated in a leadership certificate program	ENV10A3	35824	0	1	.07	.256
Participated in a leadership lecture/workshop series	ENV10A4	35829	0	1	.23	.418
Participated in a positional leader training	ENV10A5	35829	0	1	.17	.378
Participated in a leadership capstone experience	ENV10A6	35824	0	1	.03	.180
Participated in a leadership course	ENV10A7	35829	0	1	.18	.380
Held a leadership minor	ENV10A8	35824	0	1	.03	.170
Held a leadership major	ENV10A9	35817	0	1	.02	.134

Table A.2 continued. Descriptive statistics for all variables

Variable Label	Var. Name	N	Min.	Max.	Mean	SD
Participated in a short-term service immersion	ENV10A10	35829	0	1	.10	.306
Participated in an emerging or new leaders program	ENV10A11	35829	0	1	.10	.298
Participated in a living-learning leadership program	ENV10A12	35829	0	1	.07	.250
Participated in a peer leadership educator team	ENV10A13	35829	0	1	.08	.277
Participated in an outdoor adventure leadership program	ENV10A14	35829	0	1	.05	.209
Participated in a women's leadership program	ENV10A15	35829	0	1	.04	.206
Participated in a multicultural leadership program	ENV10A16	35829	0	1	.05	.226
Institutional characteristics						
Carnegie Baccalaureate	BACCALAU	35829	0	1	.1031	.30409
Carnegie Doctoral/Research, High Research, Very High Research	ALL_RESEARCH	35829	0	1	.4561	.49808
Carnegie Masters	MASTERS	35829	0	1	.4408	.49649
Enrollment below 5,000	SIZE_BELOW_5K	35829	0	1	.2072	.40529
Enrollment between 5,000-9,999	SIZE_5K_10K	35829	0	1	.3272	.46918
Enrollment between 10,000-19,999	SIZE_10K_20K	35829	0	1	.2184	.41317
Private control	PRIVATE	35829	0	1	.6014	.48961
Selectivity unclassified	UNCLASSIFIED	35829	0	1	.0172	.13009
Selectivity competitive	COMPETITIVE	35829	0	1	.2036	.40271
Selectivity very, highly, most competitive	VHM_COMPETITIVE	35829	0	1	.7556	.42974
Setting suburb	SUBURB	35829	0	1	.2725	.44523
Setting town	TOWN	35829	0	1	.0899	.28608
Religious affiliation	RELIGIOUS	35829	0	1	.4037	.49064