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A Text-Message Nudge Intervention to Increase Student Professional Development Education

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A TEXT-MESSAGE NUDGE INTERVENTION TO INCREASE STUDENT PROFESSIONAL DEVELOPMENT ENGAGEMENT

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ABSTRACT

A TEXT-MESSAGE NUDGE INTERVENTION TO INCREASE STUDENT PROFESSIONAL DEVELOPMENT ENGAGEMENT

by Catherine Voss Plaxton

This experimental study explored the effects of a text-message intervention on college sophomore and junior engagement in professional development at San José State University. One goal of the study was to assess whether status quo bias poses a barrier to student preparation for the college-to-work transition. A second goal was to measure the impact of a text-message, behavioral design intervention intended to influence real-time decision-making and overcome status quo bias toward professional development. The treatment intervention had a weak positive, but not significant, effect on student engagement in professional development. Alternative explanations were sought for post-intervention differences in professional development across comparison groups defined by demographics, prior experiences, and perceived and actual control over professional development. Other evidence of status quo bias was revealed in the results that juniors, transfer students, and those with positive pre-intervention perceived control over professional development were significantly more engaged in professional development than their peers. Evidence of capacity barriers to professional development were shown by the results that students working for nondiscretionary income and/or more than 20 hours per week were relatively less engaged than their peers. To prepare all college students for the college-to-work transition, professional development programs must be intentionally designed to overcome status quo bias and barriers to engagement.

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Chapter One: Introduction and Statement of the Problem

Professional development engagement (PDE), a dimension of college student engagement, involves participation in activities that prepare students for the college-to-work transition (Blau & Snell, 2013). Because employers seek graduates who have built work-related knowledge and skills (National Association of Colleges and Employers, 2017), ongoing PDE during college is essential to student employment success and economic self-sufficiency after graduation. This experimental study explored the effects of a text-message nudge intervention on PDE. One goal of this research was to assess whether status quo bias, the tendency to maintain current decisions and associated behaviors even when new information emerges and better options are available (Samuelson & Zeckhauser, 1988), exists as a barrier to student PDE. A second goal of this research was to measure the impact on PDE of a text-message nudge intervention intended to influence real-time decision-making and overcome status quo bias. The Theory of Reasoned Action facilitated exploration of alternative explanations for post-intervention PDE level differences across groups. Comparison groups included those differentiated by demographics, experiences, perceived behavioral control over PDE, and actual control over PDE.

The Unresolved Issue in Education

In 2017, over 85% of incoming U.S. freshmen indicated the top reason they chose to attend college was, "to be able to get a better job" (Eagan, et al., 2017). Since 2009, this goal has been a top reason students identify for attending college. Consistently in third place since 2010 has been the goal, "to get training for a specific career" (Rampell, 2015).

Some would argue these aspirations are too narrow for the college experience, but the connection of degree attainment to employment success and economic self-sufficiency is unsurprising. The unemployment rate of bachelor's degree graduates typically is half that of high school graduates (U.S. Department of Labor Bureau of Labor Statistics, 2018). Over a lifetime, the earnings of bachelor's degree recipients are $570,000 higher than high school graduates (Greenstone, Looney, Patashnik, & Yu, 2013). Higher education also serves as a catalyst for social mobility. Children born into the lowest socioeconomic quintile who earn a college degree have a 19% chance of breaking into the top income quintile, versus a 5% chance for those without a college degree (Greenstone, Looney, Patashnik, & Yu, 2013).

To maximize the employment opportunity associated with higher education, students must prepare for the college-to-work transition throughout their time in college. Yet students generally lack professional development engagement (PDE), which is defined as engagement in "activities designed to help students prepare for a successful college-to-work transition" (Blau G. , et al., 2014, p. 137). Nationally, 39% of students who graduated from 2010 to 2016 never visited or cannot remember having visited their career services office (CSO), where the college-to-work transition is a primary focus (Gallup, 2016). Internships, which are "a form of experiential learning that integrates knowledge and theory learned in the classroom with practical application and skills development in a professional setting" (National Association of Colleges and Employers, 2011) are an aspect of PDE that is highly valuable for exploring careers and developing

transferable skills. Yet, only 48% of graduating seniors reported having had at least one internship or similar field experience (National Survey of Student Engagement, 2017).

How is it possible that students graduate with such low PDE when they enter college expecting their degree to result in employment opportunity? One explanation is that several barriers exist to impede PDE. To build motivation to engage, the Theory of Reasoned Action suggests that students must be aware of PDE opportunities, value and be inclined toward PDE, and have ultimate control over their ability/capacity to engage in professional development (Fishbein & Ajzen, 2010). Therefore, perhaps professional development opportunities are not sufficiently promoted to generate awareness. Perhaps students don't believe that PDE is important, or the campus culture has not reinforced this notion. Perhaps students are not offered the campus resources and environmental support to empower them for PDE.

An alternative explanation for low student PDE could be that when faced with the complexity, uncertainty, and delayed gratification associated with PDE and its outcomes, students rely on decision-making heuristics, or rules of thumb, and inaccurate assessment of likely outcomes to determine their engagement levels. In the college-to-career transition, students must confront an overload of career options, strong feelings of vulnerability and doubt, and ambiguous, distant outcomes. In this context, it is possible that students use heuristics to simplify choices and reduce perceived risk related to professional development activities. Such PDE-related heuristics may lead students to place higher value on present-moment demands and routines, such as the day's academic, social, or part-time employment commitments. Continued use of such decision-making

heuristics can lead to long-term cognitive bias (Thaler & Sunstein, 2008). In other words, though students may possess the awareness of, value for, and access to resources for professional development, their decision-making strategies may lead them to overvalue investment in present-moment demands and routines at the expense of PDE.

In this cognitive bias scenario, fostering awareness of PDE opportunities is unlikely to build student PDE as students may have formed automatic responses to PDE opportunities based on entrenched decision-making heuristics (West, van Stralen, & Michie, 2011). Instead, influencing the environment within which students make real-time decisions regarding PDE in the effort to correct common decision-making biases could result in increased PDE. The literature review will examine further the possible motivational and cognitive bias barriers to PDE as well as ways to overcome such barriers.

Statement of the Problem

Employers prefer to hire college graduates who can provide evidence of their transferable skills; they also indicate that graduates lack such skills (National Association of Colleges and Employers, 2017). To build sufficient evidence of transferable skills, students must pursue professional-development opportunities throughout their college experience. Opportunities to build transferable skills abound within classrooms, field experiences, and extracurricular activities. Yet, students must learn how to translate those experiences to professional settings, signal their competence to employers, and compete for employment opportunities at graduation.

Campus career services offices (CSO) typically offer a range of educational resources to help students articulate their skills and compete for off-campus professional experiences, such as internships (National Association of Colleges and Employers, 2018). Students report that having secured and completed an internship or similar off-campus, paid, professional experience is a key way to build transferable skills (Crain, 2016). Completing professional readiness education and securing an internship are examples of PDE that prepare students for the college-to-work transition (Blau & Snell, 2013). As an example of the value of PDE to employers, after GPA, the use of career services combined with the number of internships appears to predict liberal arts student employment at graduation (Townsley, Lierman, Watermill, & Rousseau, 2017).

Along with the level of PDE, the timing of PDE is critical. Most large employers engaged in on-campus recruiting events, such as career fairs, begin recruiting interns an average of eight months before their start date (National Association of Colleges and Employers, 2018). Though many employers recruit on a smaller scale throughout the year as openings emerge, students must be ready to apply to and interview with these employers at the start of each academic year to capitalize on the most internship opportunities. Therefore, PDE in the sophomore and junior years is essential to securing off-campus professional experiences, building evidence of transferable skills, and mastering the job-search process before senior year.

Yet, students lack sufficient PDE to form transferable skills and prepare for the college-to-work transition. Amid the many demands for student attention each day, PDE does not provide an instant payoff like other forms of student engagement that emphasize

social engagement or wellness. That lack of an instant payoff as well as the complexity and uncertainty associated with building a career may lead students to prioritize present concerns, thus revealing possible status quo bias associated with PDE. Status quo bias involves the inclination to maintain current decisions and associated behaviors even when new information emerges and better options are available (Samuelson & Zeckhauser, 1988). Assuming the presence of status quo bias, addressing a lack of student PDE cannot be accomplished through increased promotion of PDE opportunities. Instead, fostering student PDE may require interventions designed to overcome status quo bias.

Justification for the Study

This study explored college student professional development, an increasingly existential issue for higher education given the connection students make between a college degree, employment success, and economic self-sufficiency. Contemporary researchers have identified emerging issues that may negatively influence how higher education consumers and funders view the relationship of higher education to employment success. Though unemployment rates for college graduates are half those for high school graduates (U.S. Department of Labor Bureau of Labor Statistics, 2018), current estimates of underemployment in work that does not require a college degree or does not support economic self-sufficiency range from 34.1% for all college graduates to 41.5% for recent college graduates (Federal Reserve Bank of New York, 2018). Though employers indicate a high need for graduate PDE, major gaps exist between the 83% of students who transition to work after college (National Association of Colleges and Employers, 2018) versus the 61% of students who at least visited their CSO (Strada

Education Network and Gallup, 2017) and the 48% of students who completed an internship during college (National Survey of Student Engagement, 2017).

To grow student PDE, employment success, and economic self-sufficiency, colleges must reexamine how they incorporate PDE within degree and co-curricular programs. Despite the importance of PDE, research on PDE is limited and emerging. This study builds on that limited research and explores the PDE construct from a cognitive bias perspective to examine differences in student engagement levels. This study also adds to the limited behavioral economics research in higher education. Though behavioral economics applications have been explored broadly in commerce and wellness settings, research on its application in higher education student engagement is limited. No studies on behavioral economics and PDE exist. From the insights generated by this study, new strategies to increase PDE and student engagement (SE) in general may be developed.

Purpose of the Study

The purpose of this experimental study was to assess whether status quo bias is an impediment to college student engagement in professional development. Given the complexity, uncertainty, and time delay associated with PDE, the researcher suspected that status quo bias exists in student decisions to invest in PDE. This dynamic was explored through the implementation of an intervention designed to influence sophomore and junior real-time choice to engage in professional development. The study evaluated the difference in PDE between the intervention treatment group that received text messages intended to change both decision environment and participant PDE ability/capacity versus the control group that received text messages intended to change

only participant ability/capacity for PDE. Alternative explanations for post-intervention PDE levels, including the possible existence of actual control and perceived behavioral control/self-efficacy barriers to PDE, also were explored.

Research Questions

This experimental study will explore the following four research questions.

1. Can a text-message intervention designed to influence real-time decision-making in sophomore and junior internship-seekers affect their level of PDE?
2. Do PDE levels differ due to student background factors, including demographic and experiential factors, as defined in the Theory of Reasoned Action?
3. Do PDE levels differ due to perceived behavioral control as defined in the Theory of Reasoned Action?
4. Do PDE levels differ due to actual control factors, including ability/capacity and college environment factors, as defined in the Theory of Reasoned Action?

Theoretical Framework

The study assessed change in professional development engagement (PDE) as a result of a behavioral economics intervention. PDE is a recently developed dimension of student engagement that involves the use of career services and resources, attendance at on-campus recruiting events, participation in student professional organizations, and participation in internships or similar work experiences. Due to differing resources and strategies employed by CSOs, PDE opportunities may manifest in unique ways at different campuses.

The Theory of Reasoned Action was used to explore the antecedents of intended behaviors, such as PDE. This study involved participants who indicated a goal for PDE and for securing an internship, in particular. According to the Theory of Reasoned Action, these participants possessed the requisite background characteristics, beliefs, attitudes, actual control, and intention that should lead to PDE (Fishbein & Ajzen, 2010). Based on this theory, select factors of background characteristics, perceived control (a form of attitude), and actual control were assessed to identify potential barriers or facilitators to PDE that arose during the study.

The third theoretical basis for this study was the research on cognitive biases in the emerging field of behavioral economics. Behavioral economics provided the design foundation for the nudge intervention, which was intended to influence the decision-making environment as defined in the Theory of Reasoned Action. Behavioral economics refutes the traditional microeconomics assumption that people behave as rational agents when choosing between alternatives. If one assumes all people behave rationally, a traditional intervention to a behavioral issue might be to focus on building awareness, positive attitude, and strong intentions towards a particular behavior (Dolan, et al., 2012). Yet when humans make irrational choices regarding behaviors, more awareness-building and education often does not lead to changes in intention or behavior. Only by confronting the bias through reframing choices can the true costs of alternatives be revealed. This approach can be particularly beneficial in framing decisions affected by complexity, uncertainty, or delayed gratification, as is the case for decisions related to the college-to-work transition.

Assumptions

Two assumptions informed the design of this study. The first assumption was that students avoid PDE because of the cognitive biases they employ when making real-time decisions on whether to invest effort in PDE over other activities. Those cognitive biases cause students to dodge PDE because it is perceived as complex, offering uncertain payback relative to other activities, and something that can be done in the future when they are closer to graduation. The aim of this study's intervention was to reframe and influence the environment of real-time decisions on PDE to reduce anticipated status quo cognitive bias.

A second assumption of this study was that the participants already possessed the awareness, attitude, and intention necessary to engage in PDE. The Theory of Reasoned Action indicates that these elements are precursors to motivated behaviors. Therefore, the intervention was designed to influence present-moment decision-making involving PDE rather than the factors leading to motivation for PDE. Furthermore, because the intervention was intended to influence PDE and PDE involves a range of developmental activities, student pre-intervention level of understanding and skill associated with internship acquisition did not limit their ability/capacity for PDE.

Delimitations and Limitations

This study was bounded by several limitations. One limitation of this study was that all participants were generated from a single, high-enrollment, urban, public, master's university. Further, the intervention was limited to assessing impact on PDE. Therefore,

the findings of this study may not be applicable to other campuses or other domains of student engagement.

A second limitation of this study was that only sophomores and juniors were invited to join this intervention. The Internship Fitness Challenge (IFC) intervention was designed to foster PDE in students seeking an internship. Students who were not invited or did not register for the IFC despite being invited were not involved in this study and did not have access to the IFC intervention. Yet, all students retained access to the range of PDE activities measured in this study. The study didn't include freshman, whose predominant career-development tasks typically involve selecting a major and exploring initial career interests. The study also didn't include seniors, who ideally are focused on finding full-time, skilled work rather than internships. Therefore, any insights generated in this study may not be transferable to freshman or senior student populations.

A third limitation of this study was that the students who need the most support to engage in PDE may have been the least likely to register for this study. It was possible that the students most affected by status quo bias and inertia did not choose to take the risk of joining the IFC. These same change-averse students are unlikely to take substantial risks to achieve future employment success unless the environment is structured to scaffold their involvement.

A fourth limitation of this study was that the unique participant PDE experiences during this study may have created differing levels of reinforcement for their ongoing PDE. For example, some students may have chosen to develop a résumé through engaging in individual career advising while others may have chosen to attend a résumé

workshop. The differing learning methods and learning facilitators may have produced different effects. Because the units of assessment in this study were the population-level PDE, such differing service effects were not expected to prevent measurement of overall intervention effects on student engagement.

A final limitation of this study was that the quantitative methods employed may have lacked sufficient depth to adequately represent behavior antecedents described in the Theory of Reasoned Action. It is possible that a more nuanced understanding of such antecedents would be developed through qualitative methods. Because little research has been completed on PDE and no research on PDE has assessed the presence of cognitive bias in the college-to-work transition, the researcher expects that this study will provide a starting point for future research in the area using a variety of methods.

Significance of the Study

The primary beneficiaries of this study are expected to be career services leaders and the students they serve. On most campuses, career services typically are structured as non-mandatory services that students independently must choose to use. Career services teams invest considerable resources to promote their services to students in hopes of increasing awareness and engagement (National Association of Colleges and Employers, 2018). By exploring how status quo bias may affect student PDE in ways that negate the value of service promotion, this study may illuminate novel ways to increase student use of career services through alternative means. Students may benefit from this study by being compelled through the restructuring of career service engagement strategies to overcome status quo bias and better prepare for the college-to-work transition.

Executive student success leaders may benefit from this study if they deem graduate employability, employment success, and economic self-sufficiency to be a campus priority. This study may assist them in understanding barriers and facilitators to student PDE as well as in considering how to position career services within the range of student success services. To the extent that this study reveals that status quo bias could be a barrier to student PDE, then creating default PDE choices for students by embedding professional development education and experiences in curriculum could be an important consideration. Furthermore, because general student success depends on students being able to prioritize long-term goal attainment over short-term pleasure, it is anticipated that learning from this behavioral economics experiment could prove useful in many student engagement domains. Because it is neither desirable nor feasible to make all student services mandatory, this study could highlight ways that low-cost, behavioral economics interventions could increase student engagement with essential services without reducing student freedom of choice or increasing student tuition fees and opportunity costs.

Finally, employers also may benefit from this study. Should this study lead to insights that spur more student PDE, employers may encounter better prepared job and internship candidates. Furthermore, human resources professionals may find the results of this study useful when considering how to encourage early-career employees to take more risks to achieve career growth.

Summary

The value of a college degree to future career options is undeniable. Yet, many students lack sufficient preparation for the college-to-work transition that most will

experience after graduation. To provide evidence to employers that they are prepared for the workplace, students must pursue professional-development opportunities throughout their time in college. PDE is newly defined element of student engagement that is focused on the "activities designed to help students prepare for a successful college-to-work transition" (Blau & Snell, 2013). The complexity, uncertainty, and relatively distant outcome of the college-to-work transition is a typical of situations likely to cause status quo bias. Status quo bias is shown when individuals maintain current decisions and associated behaviors even when new information emerges and better options are available (Samuelson & Zeckhauser, 1988).

The purpose of this experimental study was to explore if status quo bias creates a barrier to student engagement in professional development during college through the implementation of a 12-week text-messaging intervention. The Theory of Reasoned Action (Fishbein & Ajzen, 2010) and the MINDSPACE Framework (Dolan, et al., 2012) of behavioral economics techniques provided models and strategies for the intervention design. The intervention encouraged students to engage in professional development opportunities offered by the San José State University Career Center throughout the fall 2018 semester. Differences in PDE across participant behavior antecedents defined in the Theory of Reasoned Action also were explored.

Chapter Two: Review of the Literature

Introduction

The following review of literature explores the purpose and value of student professional development engagement (PDE) as well as potential causes for a lack of PDE. PDE is an element of student engagement that focuses on preparation for the college-to-work transition and has been shown to increase student success on several measures related to graduate employment. Two theoretical frameworks are used to analyze the possible reasons why students don't engage in PDE. First, the Theory of Reasoned Action was used to assess the antecedents to PDE behaviors. Then, insights from the field of behavioral economics are used to explore situations when individuals, despite intentions for a behavior like PDE, don't adhere to plans to perform those behaviors. The intersections of these theoretical frameworks informed this study's intervention design. Finally, research on student PDE is summarized and explored to identify the unique contribution this study will make to the student engagement research.

Professional Development Engagement and the College-to-Work Transition

Students most directly experience the impact of a college degree on their lives during the college-to-career transition. The college-to-career transition involves graduate emergence into career pathways, including work for an employer, self-employment, graduate school, volunteer service, or military service. The focus of this study is student preparation for the college-to-work transition. In 2017, 85% of incoming freshmen across the U.S. indicated enhanced employment prospects as the top reason they chose to

attend college (Eagan, et al., 2017). In the following section, three factors associated with success in the college-to-work transition will be described.

The first success factor for the college-to-work transition is employability, which is the ability of the individual to "gain initial employment", "maintain employment", "make transitions between jobs and roles within the same organization", and "obtain new employment if required" (Hillage & Pollard, 1998, p. 2). Foundational to employability are forming positive self-efficacy beliefs and adapting one's behavior based on reflection and feedback (Knight & Yorke, 2002). Because past workers have held an average 11.7 different jobs over a lifetime (United States Department of Labor, 2018) and future employment arrangements are predicted to be even more fluid, cultivating lifelong employability will remain an essential activity in the future.

The second success factor that can be applied to the college-to-work transition is employment success, which is achieved by securing skilled, degree-level employment within two months of graduation (Sagen, Dallam, & Laverty, 2000). Despite a strong economy, 41.5% of graduates in December 2016 reported underemployment, which is defined as working in a role that does not require a college degree (Federal Reserve Bank of New York, 2018). Gaps in graduate skilled employment and earnings are even higher for students from low-income backgrounds (Hershbein, 2016) and those earning liberal arts degrees (Federal Reserve Bank of New York, 2018). It is possible that college graduate underemployment is a sign of the complex college-to-work transition and the possibility that many graduates did not reach employability while in college. Prolonged underemployment in roles that do not require a college degree can reduce future graduate

employment prospects and have lifelong effects on income (Nunley, Pugh, Romero, & Seals, 2017).

The third success factor that can be applied to the college-to-work transition is economic self-sufficiency. Economic self-sufficiency is defined as an individual's "surplus of economic resources to meet physical needs" (O'Boyle, 1987, p. 27). In the current economy, it cannot be assumed that economic self-sufficiency follows employment success. A longitudinal study on graduate transitions into the workforce revealed that 50% of new graduates relied on the support of their families, including nearly half of those who were employed full-time (Serido & Shim, 2014). Contributing to the challenge of achieving economic self-sufficiency may be college graduate debt load, which is currently at a median of $17,000 and requires monthly payments estimated at nearly $400 per month (Board of Governors of the Federal Reserve System, 2017). There is evidence that graduates who are debt-constrained are driven to narrow career choices based on income potential (Rothstein & Rouse, 2011).

To achieve employability, employment success, and economic self-sufficiency, graduates must build evidence that they possess the knowledge, skills, and experience that are valued by employers. Employers particularly are attracted to candidates that possess both position-specific and transferable skills, or skills that are useful across a range of occupations and industries. The National Association of Colleges and Employers (NACE) has defined the most desired transferable skills, called "career readiness competencies" (National Association of Colleges and Employers, 2017). These competencies were derived from research on employers who regularly hire new college

graduates. Among the competencies are critical thinking/problem solving, oral/written communication, teamwork/collaboration, digital technology, leadership, professionalism/work ethic, global/intercultural fluency, and career management, which encompasses many elements of employability.

As was previously indicated, most students associate college with the ability to achieve employment success (Eagan, et al., 2017). Yet, many academic programs are not designed with employability as a goal. Employers also seem to consider degree level and institution to filter candidates based on assumptions about transferable skills candidates have gained from such programs (Bills, 2003). However, controversial value-added measures for transferable knowledge and skills acquired from college degrees have not revealed large increases when measured through the Collegiate Learning Assessment (Arum & Roksa, 2014). The perception that a college degree might not instill employability is reinforced by employer feedback. NACE analysis of employer perceptions regarding candidate evidence of career readiness competencies show that students fall considerably short in employer evaluations of all the competencies except digital technology (National Association of Colleges and Employers, 2017).

The extent to which universities bear responsibility for student career preparation and workforce development is a subject of considerable debate. Though an analysis of how these duties fit within the mission of higher education is beyond the scope of this study, it seems evident that academic pursuits alone are not sufficient to prepare students for the college-to-work transition. Students must engage in curricular and co-curricular development of work-related knowledge, skill, and conduct to be ready for the transition

to work. Likewise, employers must accept their central role in providing students access to workplace experiences that help them develop employability.

Student professional development engagement (PDE) is a type of activity that can help resolve student employability gaps. PDE has been shown to help students remain in college, build transferable skills, and achieve employment success (Blau & Snell, 2013). PDE is defined as "activities designed to help students prepare for success in the college-to-work transition," such as building awareness of workplaces, interacting with professionals and employers, and completing work-related experiential education (Blau & Snell, 2013). PDE is related to, but distinct from, career development engagement (CDE), which is focused on student career self-assessment and reflection, major or career exploration, and career planning (Blau & Snell, 2013).

PDE was developed as a dimension of student engagement (SE), which is measured through the National Survey of Student Engagement as "the amount of time and effort students put into their studies and other educationally purposeful activities" (National Survey of Student Engagement, 2018). SE serves as a "predictor of learning and personal development" associated with the college experience (Carini, Kuh, & Klein, 2006). Unlike most SE dimensions that focus on campus-based engagement, PDE was envisioned as student preparation for and immersion in off-campus professional settings.

The PDE construct includes 11 items involving professional-development activities which are listed in Appendix A (Blau, Blessley, Kunkle, Schirmer, & Regan, 2017). Of the eleven items in the construct, eight refer to educational and employment-connection services typically offered by campus career services offices (CSO), two refer to student

professional organization engagement, and one is a measure of the number of internships a student has completed while in college. An internship is "a form of experiential learning that integrates knowledge and theory learned in the classroom with practical application and skills development in a professional setting" (National Association of Colleges and Employers, 2011) and may be paid or unpaid, full-time or part-time, seasonal or occurring throughout the year.

PDE facilitates hands-on career exploration focused on workplace contexts and offers the potential to form deep insights on viable career possibilities. The best sources of initial information on career possibilities arise from classroom-based learning about career pathways, such as those offered by CSOs, and involvement with employers via recruiting events or internships (Zondag & Brink, 2017). In addition to discovering career options, preparing for the college-to-work transition involves achieving developmental milestones, including acquiring vocational self-concept, gaining workplace culture awareness, forming realistic expectations of the workplace, as well as building transferable skills (Murphy, Blustein, & Bohlig, 2010; Wendlandt & Rochlen, 2008). Students who have actively constructed plans for employment during and after graduation are better able to manage stress associated with student loans obligations and complete college (Britt, Ammerman, Barrett, & Jones, 2017). A lack of these assets is related to poor psychological adjustment and turnover of recent college hires (Saks & Ashforth, 2000).

Career counseling or advising, a service of most CSOs and an element of PDE, also functions as an effective resource in support of the previously described developmental

tasks. Students who engage in career-development counseling achieve growth in Chickering's (1969) psychosocial development tasks (Bowers, Dickman, & Fuqua, 2001). Individuals who receive career counseling identify self-exploration, increased vocational identity, emotional support, and reduction of psychological distress as the primary gains, which mirror many of those realized by clients who have received other forms of counseling (Anderson & Niles, 2000; Multon, Heppner, Gysbers, Zook, & Ellis-Kalton, 2001).

Beyond the campus, internships serve as an immersive career exploration laboratory by enabling students to confirm or reject career options (Rothman & Sisman, 2016). Internship experiences are especially beneficial for first-generation students whose career aspirations expand when they are given opportunities to connect their life experiences to workplace settings (Raque-Bodgan & Lucas, 2016). Across all degree programs and socioeconomic levels, internships, in particular, have been shown to positively affect academic performance (Binder, Baguley, Crook, & Miller, 2015). With only 27% of college graduates working in careers directly related to their majors (Abel & Deitz, 2013), knowing how to explore careers, reflect on career experiences, and revise career goals through direct experience is essential to lifelong employability.

PDE often results in student success at sourcing employment opportunities. In a large, U.S.-based study of recent graduates, 17% reported finding their jobs through on-campus resources including CSO resources and faculty-employer relationships (Arum & Roksa, 2014). On-campus recruiting events, like career fairs, were reported to be the most direct sources (Arum & Roksa, 2014). PDE also results in many students finding opportunities

through previously built relationships with employers. Arum and Roksa (2014) indicated that 25% of the college graduates in their study reported finding jobs through former employers, including those associated with their previous internships and/or volunteer roles.

PDE is directly related to student employment success. A large study comparing high-impact practices (HIPs) that are known to correlate with retention and graduation revealed that participation in internships increased the potential that a student will secure a new job after graduation more than any other HIP (Miller, Rocconi, & Dumford, 2018). Internships have been shown to have positive effects on candidate employability and employment success (Callanan & Benzing, 2004; Taylor, 1988) as well as entry-level compensation (Gault & Redington, 2000). Furthermore, if the internship was secured through a competitive hiring process, students gain skill and self-efficacy in conducting job searches that they can leverage for a full-time job search at graduation.

PDE is particularly valuable for students who are pursuing non-applied degrees. A study involving thousands of randomly generated résumés submitted to job openings found that for business positions, having a business degree was not preferred, but having a related internship resulted in a 14% higher employer response rate (Nunley, Pugh, Romero, & Seals Jr., 2016). Acquisition of professional skills through internships for liberal arts students is associated with securing successful, skilled, full-time employment after graduation (Martin & Frenette, 2017). In fact, after GPA, the use of career services combined with the number of internships predicts liberal arts student employment at graduation (Townsley, Lierman, Watermill, & Rousseau, 2017).

Despite the previously described benefits of PDE, students generally lack PDE. Nationally, 39% of students who graduated from 2010 to 2016 never visited or could not remember having visited their CSO, where the college-to-work transition is a primary focus (Gallup, 2016). Only 48% of graduating seniors reported having completed at least one internship or similar field experience (National Survey of Student Engagement, 2017). Though college students experience significantly higher levels of psychological distress and difficulties making career decisions than the general population, only half of students are aware of their campus' career services and less than a fifth use career services (Fouad, et al., 2006).

Given the evidence that PDE is valuable to employers and students, students should be encouraged and empowered to invest effort in PDE throughout college. Without PDE, students will not achieve their post-degree goals of career opportunity nor the previously described standards of employability, employment success, and economic self-sufficiency. The following sections will examine possible reasons that students don't engage in PDE and consider how to resolve gaps in engagement.

The Theory of Reasoned Action and PDE Intention

As was previously noted, the large majority of students intend to leverage their college degree to secure quality employment opportunities after college. The Theory of Reasoned Action suggests that the best predictor of behavior is intention (Fishbein & Ajzen, 2010). This theory was designed to explain the formation of behavior starting from background characteristics, beliefs, attitudes, and intention to the execution of an intended behavior. A diagram of this theory is shown in Figure 1. Intention is the

cognitive manifestation of a "person's readiness to perform a given behavior" and involves "the person's estimate of the likelihood or perceived probability of performing a given behavior" (Fishbein & Ajzen, 2010, p. 39). Intention is considered to be the immediate precursor to behavior. Three aspects of cognition determine an individual's intention: their attitude toward the specific behavior, their perception of social norms relating to the behavior, and their perceived behavioral control over outcomes associated with the behavior.

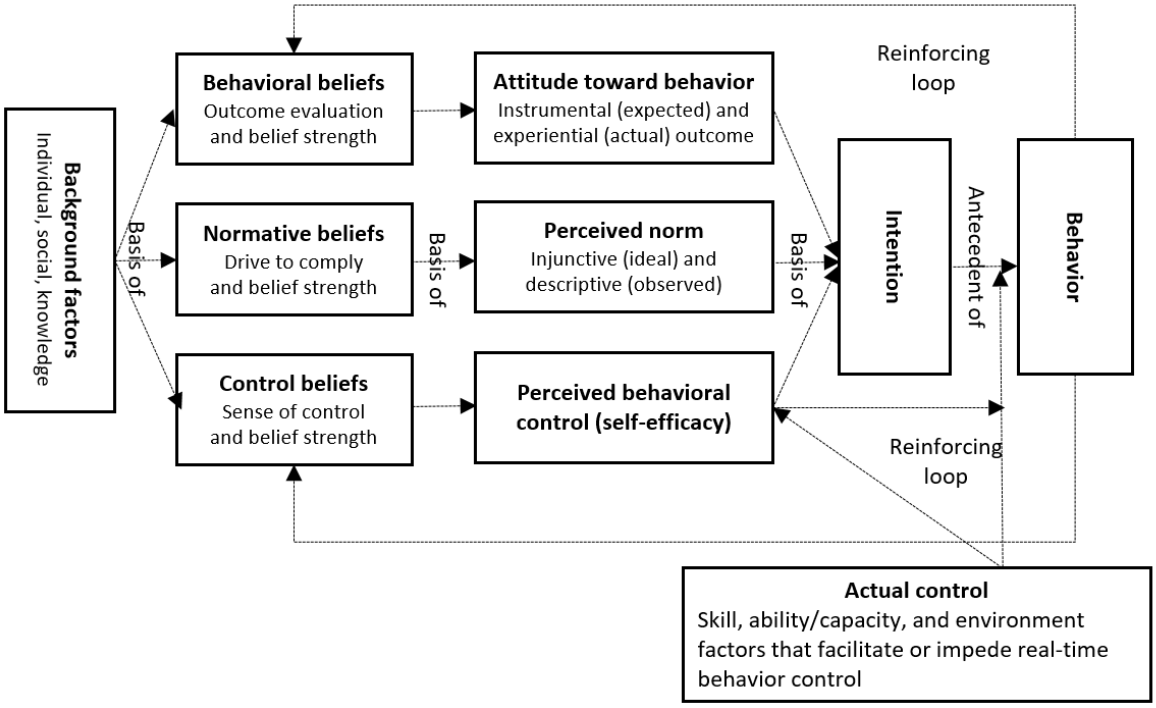

Figure 1. Annotated diagram adapted from the Theory of Reasoned Action, by Fishbein and Ajzen (2010).

Fishbein and Ajzen (2010) define attitude as, "a latent disposition or tendency to respond with some degree of favorableness or unfavorableness to a psychological object" (p. 76). Attitudes are based on beliefs in that they are 'formed automatically and

inevitably as new beliefs are formed about the object" or situation (Fishbein & Ajzen, 2010, p. 97). Attitude is developed through evaluation of a hypothetical situation based on expected or previously experienced outcomes associated with a chosen behavioral response.

Norms are defined as, "perceived social pressure to perform (or not to perform) a given behavior" (Fishbein & Ajzen, 2010, p. 130). Norms are influenced by both explicit rules for behavior and implicit rules expressed by the actual behaviors of societal reference points. Normative beliefs are the foundation of norms and are developed through explicit communication with and observation of influential individuals or groups.

Perceived behavioral control refers to "people's perceptions of the degree to which they are capable of, or have control over, performing a given behavior" (Fishbein & Ajzen, 2010, p. 64). Perceived behavioral control represents the same construct as Bandura's perceived self-efficacy (Fishbein & Ajzen, 2010), which is "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1997, p. 42). Perceived behavioral control is influenced by control beliefs with respect to a particular situation (Fishbein & Ajzen, 2010). Generally, the more favorable an individual's attitude and the subjective norm associated with a behavior, the greater the intention and perceived behavioral control a person will feel.

Because 85% of students intend to build employment opportunity through their college experience, it seems reasonable to assume that most college students' attitudes are favorable towards behaviors that prepare them for the college-to-work transition. To

arrive at intention, students would have had to possess the background characteristics, beliefs, and attitudes that make them aware of the need for and importance of investment in that transition. Yet, very few students sufficiently invest in PDE. The Theory of Reasoned Action can offer a possible explanation for this inconsistency between intention and behavior.

Although attitudes, norms, and perceived control lead to intention and behavior, engagement in a behavior is arbitrated by actual control. Actual control refers to "the extent to which people possess the requisite information, mental and physical skills and abilities, the availability of social support, emotions and compulsions, and absence or presence of external barriers and impediments" to complete a behavior (Ajzen, 2005, p. 15). Actual control consists of internal and external facilitators or barriers to real-time implementation of a behavior that may be known or unknown to an individual intending an action (Fishbein & Ajzen, 2010).

The types of barriers or facilitators to actual control identified in the theory include individual skill, ability, and environment. The skill factor includes competency limitations that curb ability to complete an intended behavior when given the choice to do so. The ability factor includes elements such as mental, physical, and resource capacity to complete an intended behavior in real time. For example, while they may have the intention to follow the law, the ability of a homeless person living in their car to pay for parking tickets may be limited by their financial resources. So that the ability factor is not confused with only mental and physical ability, this study will refer to this element of the theory as ability/capacity. The environment factor of actual control involves the

presence or absence of behavior cues, such as advertising, and systemic supports, such as shopping websites that offer purchase recommendations that encourage or discourage behavior. Because of the situational nature of actual control, there is no standard way to measure actual control relative to an intended behavior.

Based on the previously noted definition of actual control, one barrier to PDE could be that students lack the necessary skills for PDE. Searching for experiential learning opportunities, such as internships, and building work experience is challenging and requires skill to gain access. Yet, many of the PDE components shown in Appendix A are defined as learning activities aimed at the attainment of experiential learning opportunities. It is unlikely that campus CSOs or other PDE-related educational sources would screen out potential participants in résumé workshops, for example, based on the skills they possess prior to the workshop. It is more likely that some university campuses lack the capacity or integration to facilitate PDE learning activities sufficiently. The median campus CSO has three staff members and serves the typical campus with a 1:1,765 ratio of staff to students (National Association for Colleges and Employers, 2017). Unless a university has integrated PDE learning activities into the curriculum or invested in scaled and mandatory learning solutions in these situations, it is unlikely that students will find sufficient campus support to build their skills for the college-to-work transition.

A second possible explanation for insufficient PDE is that students face too many ability/capacity barriers that prevent them from preparing for the college-to-work transition. These barriers may arise from mental, physical, or resource constraints.

Students must find capacity for PDE while managing coursework, part-time employment, commutes to campus, and other life obligations. Students may avoid short-term paid or unpaid internships that require them to trade off steady income from their current part-time jobs. Finally, CSOs may not provide sufficient PDE resources for students who require flexible access or tailored approaches. There is evidence that off-campus and first-generation students engage in diverse educational experiences and support services less than second-generation and on-campus students (Pike & Kuh, 2005). For some underrepresented students, barriers to engagement may involve the lack of resources and services tailored to resonate with them and reduce logistical impediments (Andrewartha & Harvey, 2017; Simpson & Ferguson, 2013).

The environment in which a student chooses whether to act on their intention for PDE activity could pose a third possible barrier to PDE. A lack of PDE embeddedness in student services, co-curricular activities, and curriculum may impede student PDE. Some CSOs lack organizational, physical, and operational integration with other student success services. The impact of such disintegration with other student services is that students are unable to form relationships with CSO staff like they do with faculty and other advisors to reinforce engagement (Cuseo, 2005). Requiring students to use such PDE-related services could solve internship-search awareness, knowledge, and skill gaps. Yet, such an approach is untailored and costly, as it does not take into account the knowledge and skills students already possess on internship-searching and the costs associated with implementing campus-wide mandatory services.

Even if students operate in an environment in which PDE facilitators are maximized and barriers are minimized, a final reason that students may not engage is that PDE is associated with one of the most complex and uncertain transitions in a student's life. The process of major and career exploration is filled with a level of ambiguity and psychological distress that can't be resolved with a single career counseling appointment or workshop. It's possible that students avoid engaging in career and professional development because of fear and avoidance relating to the college-to-work transition process. Searching for internships and jobs requires considerable tolerance for unpredictability, lack of control, and failure. A student who expects to gain an instant benefit associated with their use of a career service or attendance at a recruiting event will be disappointed. Managing expectations is an ongoing challenge for CSOs, as revealed by evidence that the least experienced job candidates have the most outsized expectations about employment outcomes (Wendlandt & Rochlen, 2008). Learning the skill and process of career management requires students to make ongoing investments throughout college to produce successful future career outcomes.

Therefore, even with intention for and actual control over PDE, students still may not engage in professional development. Inconsistency between stated intentions and actions may arise from a dynamic that is referred to as "hypothetical bias". This bias is revealed in cases when "different cognitions in hypothetical and real situations" emerge in the real-time decision to engage in a particular behavior (Fishbein & Ajzen, 2010). The effect of hypothetical bias is that "when [an individual enters] the real situation, their perceptions may change, producing a different intention" (Fishbein & Ajzen, 2010, p. 63).

Essentially, some aspect of the real-time, decision-making environment causes a person to behave in ways that are contrary to their intention.

The emerging theoretical body of behavioral economics offers more insight into the types of biases that influence real-time decision-making regarding intended behavior, particularly in situations of complexity and uncertainty like the college-to-work transition. Behavioral economics may illuminate further the reasons that students avoid PDE during college despite their intention to achieve employment success and economic self-sufficiency.

Behavioral Economics and PDE Actualization

Though the Theory of Reasoned Action indicates that people are driven to act by the combination of intention and actual control, evidence has shown that people often behave in ways that are contrary to their intention in moments that call for the intended action. Simon (1955) first observed that humans operate with *bounded rationality* in that they make decisions that do not align with classical economic models of individual utility optimization. For example, an individual who purchases lottery tickets in the hopes of accumulating assets may not consider when buying the ticket the very low probability of winning the lottery compared to the high probability of growing savings through compound interest. Even when individuals understand these probabilities, joyful stories of recent lottery winners can cause them to overvalue the probability of winning and act on an impulse to buy a ticket.

Kahneman and Tversky added to the foundation of bounded rationality by identifying several heuristics, or rules of thumb, (1973; 1974; 1979) and patterns of inaccurate

assessments of probable outcomes (1991; 1992) that people use to make real-time choices. Ongoing application of such heuristics and skewed probability assessments can lead a person to form an automatic cognitive bias for certain decision-making situations. Furthermore, use of heuristics in decision-making is most common in situations involving complexity, uncertainty, risk, and time-delayed consequences (Thaler & Sunstein, 2008).

Tversky and Kahneman (1981; 1986) found that skewed probability assessments, heuristics, and biases in decision-making can be influenced by how choices are framed. Moreover, choice preferences do not have a stable order, but are made in relation to a reference point or contextual cue (Tversky & Kahneman, 1981; 1986). For example, the cognitive overload associated with managing limited resources such as time or money can lead people to choose low levels of short-term utility from buying something they cannot afford over relatively higher levels of long-term utility from rationally managing their budget (Bertrand, Shafir, & Mullainathan, 2006). These decisions are apparent in the ways that low-income individuals are most likely to consume high-interest loans to cover short-term gaps in income.

Like the previously noted decision-making scenarios, the path to employability and employment success involves tremendous complexity, uncertainty, risk, and distant outcomes. It is possible that inaccurate probability assessments and decision-making biases are causing students to delay or avoid PDE. Such avoidance may be more pronounced when students are facing pressing current demands, such as part-time work. Trading off time invested in part-time work versus PDE may ensure a student can cover current expenses, but may have a larger impact on future earnings upon graduation.

A review of behavioral economics research in education highlighted four categories of observed cognitive biases in students (Lavecchia, Liu, & Oreopoulos, 2015). The first bias is that students tend to have a present bias that causes them to focus their attention and effort on immediate demands. The second bias is that most education settings flood students with information, which causes them to manage that resulting cognitive overload with quick decisions based on heuristics. The third bias is that students tend to embrace negative identities about themselves and their communities that reinforce low performance. The final bias is that students rely on routines and rarely stray from processes that are comfortable to them, a phenomenon known as status quo bias (Samuelson & Zeckhauser, 1988).

Though it could be argued that all of the previously described cognitive biases common to education settings could apply to lack of PDE, status quo bias may be the most relevant. Status quo bias is apparent when people maintain current decisions and associated behaviors even when new information emerges and better options are available (Samuelson & Zeckhauser, 1988). The college-to-work transition requires that students be prepared to risk their own comfort and routines by engaging in experiences and settings that are foreign to them.

The endowment effect, a related bias, refers to the phenomenon in which people value what they have more than equally valued alternatives (Kahneman, Knetsch, & Thaler, 1991). This effect may contribute to the students being unwilling to pursue a summer internship if it means leaving a current part-time job. Related to both status quo bias and the endowment effect is the tendency towards loss aversion. When faced with a

risky choice, potential losses are weighted more heavily than potential gains ((Kahneman, Knetsch, & Thaler, 1991). The combined result of status quo bias, the endowment effect, and loss aversion is that people perceive greater loss associated with negative outcomes from new actions than for negative consequences associated with inaction (Kahneman, Knetsch, & Thaler, 1991). Therefore, options for new behaviors must be perceived as offering considerably greater value than the current situation to cause behavior change.

There is evidence of a neurological basis for status quo bias. Observations are that the neural pathways required to execute "controlled, nondefault actions are similar to those previously shown to mediate outright response suppression" (Fleming, Thomas, & Dolan, 2010, p. 6006). Therefore, to overcome status quo bias requires the generation of a strong, present-moment impulse to act in a new way. Preparing for and implementing an internship search, networking, and attending recruiting events frequently do not provide this sort of immediate incentive for new action. In fact, there is evidence that the period of emerging adulthood (ages 18 to 25) is characterized by the highest rates of anxiety and avoidance of any life phase in part because of the need for career and professional development (Hoffman, Guerry, & Albano, 2018). Therefore, promotional campaigns for PDE may only add to the sense of cognitive overload and generate even more fear and avoidance. The following section of the literature review will explore the research on real-time, decision-making supports that can help individuals overcome status quo bias. These supports may be useful in helping students develop greater PDE before graduation.

Applying Behavioral Economics Insights to Overcome Status Quo Bias and Increase PDE

Interventions have been developed to leverage behavioral economics insights to influence real-time decision making. Such interventions, called "nudges", are defined as "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives" (Thaler & Sunstein, 2008, p. 6). In public service applications, nudges typically involve low-cost, scalable interventions that, "steer people toward choices that better serve their interests" (White, 2016, p. 21). Nudges have been described further as *new paternalism*, which is when "governments enact policies that attempt to help individuals achieve goals that they set for themselves" (Abdukadirov, 2016, p. 7).

Nudges are most useful for "decisions that are difficult and rare, for which [individuals] do not get prompt feedback, and when they have trouble translating aspects of the situation into terms that they can easily understand" (Thaler & Sunstein, 2008, p. 74). As was previously described, despite 85% of students attending college to secure employment opportunity, a majority of students do not engage in PDE. The college-to-work transition shares many elements of environments that are predicted to lead to inertia, including complexity, uncertainty, and time delay between action and consequence.

The transition involves complexity, in that students must select initial career paths often with an overload of choices that may offer little clarity or salience for them at that point of development. Evidence reveals that the more choices people must make in a particular situation, the greater the chance they will maintain the status quo (Oehlmann, Meyerhoff, Mariel, & Weller, 2017).

Engaging in professional development activities involves risk-taking to approach adult behaviors and workplaces when such situations seem foreign. Unlike the structured academic pursuits to which they are accustomed, searching for internships and jobs holds an uncertain pay off in a distant future. In an example of the endowment effect, time invested in searching for an internship may hold less value than other pressing concerns, such as holding onto a current part-time job that helps a student pay for living expenses. Furthermore, if the norm is that others around you are not engaged in professional development, you may be unlikely to engage in it yourself.

To influence status quo bias, choice defaults or mandated actions have been shown to offer the greatest value (Suri, Sheppes, Schwartz, & Gross, 2013). Moreover, there is evidence that requiring even small action early in a unique environment can spur individuals out of inertia (Suri, Sheppes, Schwartz, & Gross, 2013). The ideal intervention designed to influence status quo bias against PDE would create an environment in which students are required to take small PDE actions from which greater value is derived than would be from inaction.

Nudges can be organized into the following categories: reframing choices, influencing decision-making heuristics and biases, and adjusting pricing and probability. Each of the nudges rely on influencing the real-time decision-making environment rather than intention. Educators may think that giving more information or education on a subject will change behaviors because as soon as someone understands the value of a certain behavior, they will change. An assumption of this approach is that people will think rationally about the costs and benefits of a particular real-time decision. Behavioral

economics suggests that for new and highly challenging behaviors, the only way to change behaviors is by organizing the decision-making environment to respond to the ways most people are making real-time decisions about high-risk situations.

Dolan, et al. (2012) analyzed the literature on nudges to form a framework for behavior-change interventions represented by the MINDSPACE acronym. The MINDSPACE framework, detailed in Appendix B includes nine types of behavioral influences that can inform intervention design. Those influences are summarized as messenger credibility, incentives, norms of peers, default choices, salience or personal value, priming to encourage behaviors typically associated with a particular cue, affect association, encouraging keeping of commitments, and ego as the basis of decisions that allow individuals to maintain positive self-image. The behavioral economics techniques developed in this study are based on this framework. Each of these nudges represents a form of change to the real-time choice environment that does not involve simply promotion or education to change students' minds about PDE.

For each element in the MINDSPACE framework, a variety of nudges have been developed by researchers to influence specific heuristics. Though there is evidence that some nudges (norms, in particular) are culture-specific, the tendency to use decision-making heuristics to choose real-time action in complex, risky, and uncertain environment has been observed across numerous human societies (Ogaki & Tanaka, 2017). Select nudges are detailed according to the MINDSPACE framework in Appendix B. As it is not feasible to provide a detailed review of all nudge designs in this study, nudges in Appendix B were chosen for applicability to influence status quo bias.

The MINDSPACE framework provides guidance on the content of nudges. Another consideration for the design of nudges is the delivery format. For large public universities, the ability to deliver effective interventions at a low per-student cost is important. Information and communication technologies (ICT) can provide low-cost, scalable solutions that engage students in the ways to which they are accustomed. For reference, 100% of 18-29 year olds have cell phones, including the 94% that own smart phones (Pew Research, 2018). Fifty-eight percent of teens with smartphones chose text messaging as the primary method of communicating with friends (Lenhart, 2015) and 55% of teens communicate with friends daily through text messaging, a rate that is double that of any other form of communication with friends (Pew Research, 2015). The access and habits of cell phone and text-message use are formed well before students arrive on campus.

Text-message interventions have been shown to be effective in changing health-related behaviors (Head, Noar, Iannarion, & Grant Harrington, 2013), saving behaviors (Karlan, McConnell, Mullainathan, & Zinman, 2016), voting (Dale & Strauss, 2009), and college enrollment behaviors (Castleman & Page, 2014). The range of ICT tools, including text messaging, email, and social media have been shown to increase patient engagement in healthcare settings (Sawesi, Rashrash, Phalakornkule, Carpenter, & Jones, 2016). Yet, a distinction has been made between increasing general engagement and increasing effective engagement that leads to changed behavior (Yardley, et al., 2016).

The Gaps in PDE-related Research

As was presented in the first section of this literature review, there is considerable research on the elements of PDE as they relate to employability, employment success, and economic self-sufficiency. Recent research on PDE has focused on the development of the construct as a component of student engagement (Blau G. , et al., 2014; Blau & Snell, 2013) and on the need to expand business student access to PDE (Blau, Blessley, Kunkle, Schirmer, & Regan, 2017). To date, no research has been completed on PDE to explore the impact of cognitive bias on real-time decision-making to engage in professional development.

Research on status quo bias and associated interventions for general postsecondary student engagement is limited, but growing. The related issue of summer melt—when a student accepts admission to college but does not show up for the start of the academic year—has been reduced through the application of regular social media support (Martinez-Aleman & Wartman, 2009), ongoing academic coaching (Castleman, Arnold, & Lynk Wartman, 2012), and low-cost text message registration reminders (Castleman & Page, 2014). Text-message reminders also were applied to the financial aid renewal process, which resulted in a 14% increase in likelihood that participants remain enrolled in college (Castleman & Page, 2016). Sending one-time postcards with messages to influence social norms and include incentives for peer tutoring increased student use of that service by 6 percentage points (Pugatch & Wilson, 2018).

Summary

For the past decade, concern for the challenges students face in the college-to-work transition and focus on the need for student professional readiness has grown. The literature review focused on research findings in five related areas: the value of and gaps in student PDE, the Theory of Reasoned Action as a framework for increasing student PDE, the nature of status quo bias in PDE, behavioral economics techniques for overcoming status quo bias in PDE, and the use of text-messaging for student success interventions. Major findings and gaps in the research were presented.

Over 85% of incoming freshmen across the U.S. select enhanced employment opportunity as the top reason they chose to attend college (Eagan, et al., 2017). Measures of success in the college-to-work transition include employability, which is the ability of the individual to "gain initial employment", "maintain employment", "make transitions between jobs and roles within the same organization", and "obtain new employment if required" (Hillage & Pollard, 1998, p. 2); employment success, which is achieved by securing skilled, degree-level employment within two months of graduation (Sagen, Dallam, & Laverty, 2000); and economic self-sufficiency, which is defined as an individual's "surplus of economic resources to meet physical needs" (O'Boyle, 1987, p. 27). Yet, students lack professional development engagement (PDE), which is defined as "activities designed to help students prepare for success college-to-work transition," such as building awareness of workplaces, interacting with professionals and employers, and completing work-related experiential education (Blau & Snell, 2013).

The Theory of Reasoned Action suggests that the best predictor of behavior is intention (Fishbein & Ajzen, 2010). This theory explains the formation of behavior starting from background characteristics and moving through beliefs, attitudes, and intention to the performance of an intended behavior. Because 85% of students intend to build employment opportunity through their college experience, it can be assumed that most college students' attitudes are favorable towards behaviors that prepare them for the college-to-work transition. Although attitudes, norms, and perceived control lead to intention and behavior, engagement in a behavior is determined ultimately by actual control, which includes internal and external facilitators or barriers to real-time implementation of a behavior that may be known or unknown to an individual intending an action (Fishbein & Ajzen, 2010).

Research has shown that people often behave in ways that are contrary to their intention and employ cognitive biases when deciding whether to perform an intended action (Thaler & Sunstein, 2008; Simon, 1955). The cognitive bias most applicable to the college-to-work transition is status quo bias, which is revealed when students rely on routines and rarely stray from processes that are comfortable to them (Samuelson & Zeckhauser, 1988). Overcoming status quo bias requires the generation of a strong, present-moment impulse to act in a different way.

Behavior change interventions have been designed based on behavioral economics insights to influence real-time decision making toward a behavior. Such interventions, or "nudges", are "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic

incentives" (Thaler & Sunstein, 2008, p. 6). The MINDSPACE Framework, shown in Appendix B details nine types of nudges that can inform behavioral intervention design. Text-messaging and other digital tools have been used with success in large-scale behavior change initiatives (Head, Noar, Iannarion, & Grant Harrington, 2013; Castleman & Page, 2014).

Though research has been conducted to define the PDE construct, on the need for PDE, and on the value of PDE, no research has been conducted on the potential barrier to PDE posed by status quo bias.

Chapter Three: Research Design

Introduction

This chapter is organized into eight sections. The first section reiterates the purpose of the study. The second section details the research design, including the data collection strategy and the rationale for the research design. The third and fourth sections detail the setting and participants involved in the study, respectively. The fifth and sixth sections provide detail on the data sources and measures to ensure protection of human subjects. The seventh section details the study procedures, including the intervention design, participant recruitment, and pre- and post-intervention surveys. Finally, the eighth section describes the data coding and statistical tests that will be employed in data analysis.

The research questions of this study are as follows:

1. Can a text-message intervention designed to influence real-time decision-making in sophomore and junior internship-seekers affect their level of PDE?
2. Do PDE levels differ due to student background factors, including demographic and experiential factors, as defined in the Theory of Reasoned Action?
3. Do PDE levels differ due to perceived behavioral control as defined in the Theory of Reasoned Action?
4. Do PDE levels differ due to actual control factors, including ability/capacity and college environment factors, as defined in the Theory of Reasoned Action?

Restatement of Purpose

This study evaluated the impact of a 12-week, text-message coaching intervention, the Internship Fitness Challenge (IFC), on student engagement in professional development. Professional development engagement (PDE), a dimension of student engagement, involves participation in activities that prepare students for the college-to-work transition (Blau & Snell, 2013). One goal of this research was to assess whether status quo bias could be a barrier to student PDE. A second goal of this research was to examine the impact of an intervention aimed at influencing status quo bias through changing real-time decision-making environment with respect to PDE. Alternative explanations for post-intervention PDE levels also were explored, including the effect of background factors, perceived behavioral control, and actual control facilitators or barriers to PDE.

The study evaluated the difference in PDE levels between the treatment group that received text messages intended to change both participant PDE ability/capacity and decision environment versus the control group that received text messages intended to change only participant ability/capacity for PDE. By leveraging short-message service, a low-cost mobile technology to deliver the intervention, the researcher aimed to influence participants' real-time, decision-making environments through messages delivered just prior to decisions made about PDE. The PDE activities promoted through the IFC intervention were among the SJSU CSO's fall 2018 program, service, and event offerings. These CSO offerings were available to all matriculated students and alumni members.

The IFC intervention design drew on research in behavioral economics, which suggests that individuals faced with uncertain, complex, and future-focused responsibilities, such as career development, rely on heuristics (rules of thumb or decision-making shortcuts) to make real-time decisions rather than on rational cognition. Behavioral economics combines psychology and economics insights to explain why individuals often behave in ways that are contrary to their intentions. The second theoretical basis of this study and associated intervention was the Theory of Reasoned Action, which explains how background factors, beliefs, attitudes, intention, and actual control facilitate or impede decisions to act (Fishbein & Ajzen, 2010).

Research Design

This study used an experimental design in which the treatment and control groups received similar 12-week, text-message coaching messages, but only the treatment group messages incorporated insights from behavioral economics that were designed to influence real-time, decision-making environment regarding PDE. In this study, the term "real-time, decision-making environment" refers to the environment dimension of actual control that was described in the literature review and in Figure 1. The treatment group messages were intended to frame decisions in a way that would cause treatment group participants to determine in real-time that choosing PDE was more valuable to them than not choosing PDE. In other words, the treatment group text messages were intended to overcome participant status quo bias for PDE. Text messages sent to the control group promoted the same events and services, but involved primarily informational content that was not designed to influence the value the control group participants placed on PDE.

Participant recruitment was framed as an invitation to join a pilot study of an internship skill-development and coaching program, the IFC. Therefore, it was assumed that students who registered for the study had an intention to find an internship. According to the Theory of Reasoned Action described in the literature review and portrayed in Figure 1, such students already possessed background factors and beliefs that contributed to an attitude of value for internships and an intention to engage in certain activities that would help them obtain one.

To examine the impact of a 12-week, text-message behavioral economics intervention on PDE, four research questions were explored. The research questions and independent variables for each question are shown in Table 1. Student PDE items, measured as variables 1.2 through 1.24 in Appendix J, were the dependent variables for each question. Data sources for all the variables are summarized in Appendix J and will be described further in the following paragraphs.

Table 1

Summary of Variables Detailed in Appendix J

RQ number	Research question	Related variable number(s)
Independent variables		
1	Can a text-message intervention designed to influence real-time decision-making in sophomore and junior internship-seekers affect their level of PDE?	1.1
2	Do PDE levels differ due to student background factors, including demographic and experiential factors, as defined in the Theory of Reasoned Action?	4.1 to 4.10

(continued)

RQ number	Research question	Related variable number(s)
3	Do PDE levels differ due to perceived behavioral control as defined in the Theory of Reasoned Action?	2.1 to 2.17
4	Do PDE levels differ due to actual control factors, including ability/capacity and college environment factors, as defined in the Theory of Reasoned Action?	3.1 to 3.88
Dependent variables		1.2 to 1.24

The first research question examined the effect of the IFC intervention on participant PDE levels. Based on the framers' sense that the PDE construct is defined by the unique structure of PDE activities on each campus (Blau, Blessley, Kunkle, Schirmer, & Regan, 2017), PDE in this study referred to the activities offered by SJSU's CSO in the fall 2018 semester that are described in Appendix A. In Appendix J, these PDE activities were organized into PDE input variables, representing activities that lead to internship acquisition, and PDE output variables, representing outcomes of effort for internship acquisition, for data analysis.

The second, third, and fourth research questions were derived from Theory of Reasoned Action. This theory was developed to assist in behavior prediction and design of behavioral interventions through the understanding of antecedents to behavior (Fishbein & Ajzen, 2010). A diagram of this theory and its relationship to the present study is represented in Figure 2. The second, third, and fourth research questions were developed to explore alternative explanations for post-intervention PDE levels, including the effect of background factors on PDE as well as the effect of perceived behavioral control and actual control facilitators or barriers to PDE.

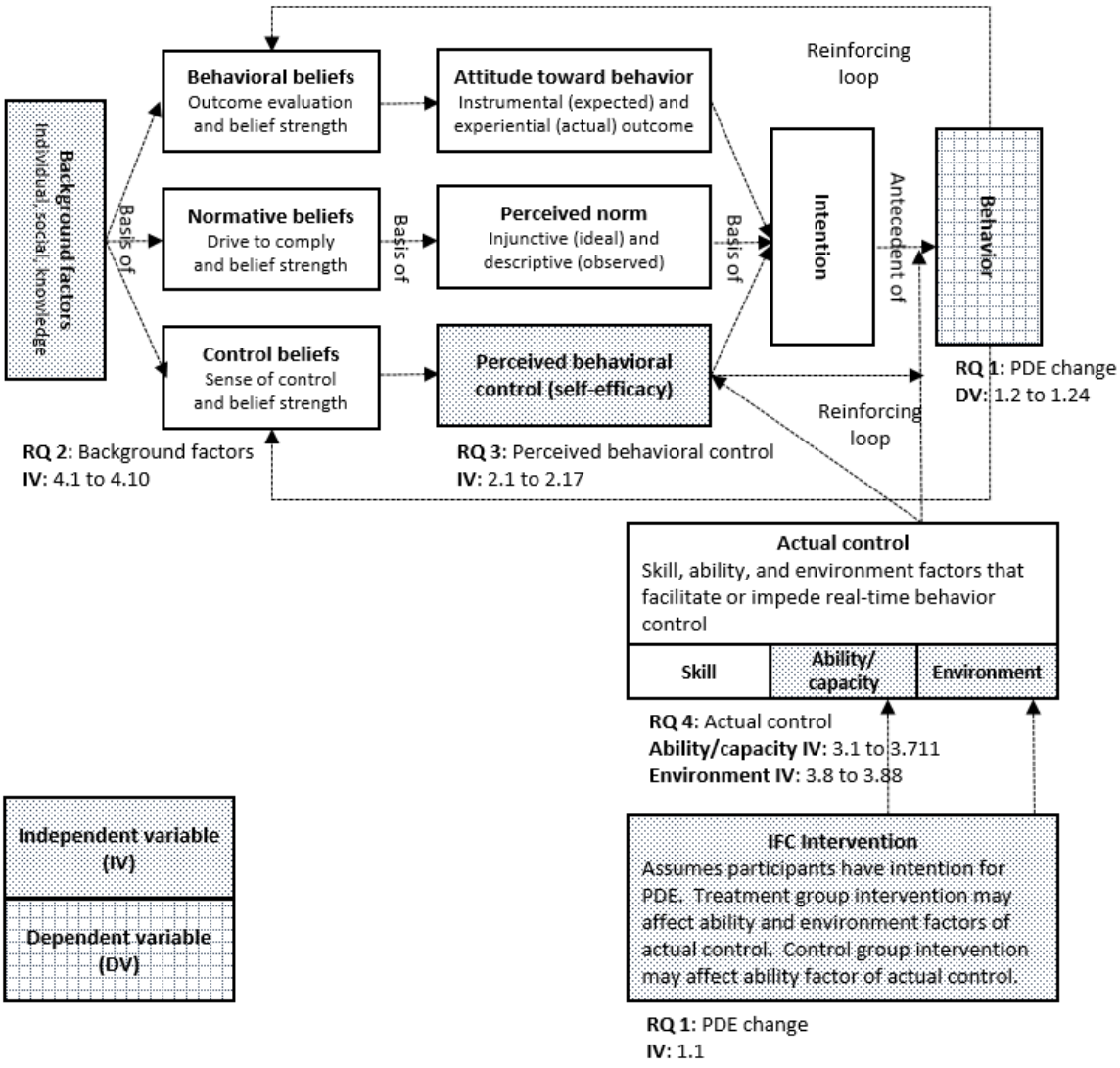

Figure 2. Diagram of the Theory of Reasoned Action as applied to the present PDE study.

The second research question explored the effect of participant background factors as defined in the Theory of Reasoned Action on post-intervention PDE. As was described in the literature review, background factors, such as ethnicity, may affect student beliefs and attitudes toward PDE. To measure background factors, variables 4.1 to 4.10 in Appendix J will be analyzed. Those variables included demographic factors of gender, ethnicity, and age. Also examined were general background experiences, including

generation in family to attend college, first entry into college as either a freshman or transfer student, and year in college. The California State University defines first-generation college students as "first in the family to attend college" (The California State University, 2018). Year in college is defined by SJSU's definitions of class standing; sophomores have earned 30 to 59 credits and juniors have earned 60 to 89 credits (San Jose State University, 2019). Specific background experiences related to PDE were also explored, including participant previous training on internship searching, previous membership in a student professional organization (SPO), the number of internships already completed, and the potential that a student was currently employed in a job related to their work. Background information for these specific experiences was gathered in the pre-intervention survey questions 1, 19, and 20.

The third research question explored the effect of participant perceived behavioral control on student PDE. As described in the literature review, research on the Theory of Reasoned Action suggests a strong correlation exists between perceived behavioral control and the execution of an intended behavior (Fishbein & Ajzen, 2010). To measure perceived behavioral control relating to internship searching, the researcher adapted six questions from Saks and Ashforth's (2000) Job Search Self-Efficacy Scale to create the study's pre- and post-intervention surveys. Those questions are detailed in Appendix G, questions 8 to 13, and Appendix J, variables 2.1 to 2.17. The IFC's six learning goals, shown in the invitation email Appendix D, are based on the same questions.

The fourth research question assessed the effects of actual control factors as defined in the Theory of Reasoned Action. The literature review described the potential effects

of actual control factors, including skill, ability/capacity, and environment, on the completion of an intended behavior. These actual control factors were expected to differ among participants in this study, which may have resulted in differences in PDE levels. The measurement of actual control factors in participants is represented in Figure 2 and will be described in the following paragraphs. Though some elements of the intervention may have affected participant skill factors of actual control, measuring change in skills associated with the intervention was beyond the scope of this study.

One of this study's primary goals was to explore the impact of using nudges to change environment factors of actual control over a behavior. Environmental factors include external contextual elements like social, policy, or process facilitators or barriers to a behavior. The text-messages nudges in the IFC intervention were designed as both social and process facilitators to PDE. The impact of the intervention on environmental factors to actual control was assessed in the first research question. Evaluation of other environmental factors in this study was limited to evaluating the impact of college culture with respect to PDE. At the time of this study, the only SJSU college that required an internship for graduation was the College of Health and Human Services. Yet other colleges, particularly the Colleges of Business and Engineering, host several SPOs and professional-development events that generally influence student PDE and internship-acquisition.

Ability/capacity factors of actual control include internal resources such as time, money, and cumulative cognitive load. Such factors could be revealed by how many hours a student works or commutes in a week. To measure ability/capacity factors in this

study, enrollment status, typical weekly work hours, reason for employment, commute time, perception of time limits affecting engagement, perception of being overwhelmed due to responsibilities, and meta-major were examined. Enrollment status was defined as part-time enrollment of 6 or fewer units and full-time enrollment of more than 6 units. Reason for employment could reveal financial barriers preventing a student from investing in an internship search, reducing work hours, and/or taking risks with their current employment to secure an internship. Therefore, reason for employment responses were coded into three potential responses that are detailed in variables 3.34 to 3.36 in Appendix J. Finally, the designation of student meta-major, or groups of similar majors, enabled exploration into the demands certain majors placed on student ability/capacity for PDE.

The specific behavioral economics techniques used to influence PDE decisions through the IFC text messages are detailed in Appendix B. Because both groups received information about readily available resources, it was impossible to avoid influencing the availability heuristic for participants in both groups. Both groups may have experienced an increase in the sense that PDE resources were readily available and the ability/capacity dimension of actual control for PDE was expanded. Therefore, both groups may have been nudged out of the status quo toward higher levels of PDE than they would have done without participating in the study. Given that the treatment group text messages employed considerably more behavioral economics techniques aimed at influencing the environmental dimension of actual control, the researcher expected to find greater PDE levels in that group.

Rationale for the Research Design

This study was intended to assess the presence of status quo bias with respect to student PDE and explore the impact of an intervention intended to influence that status quo bias. The study assumed that students who registered for the IFC already possess the necessary intention for PDE associated with securing an internship. From the Theory of Reasoned Action, this means that participants' background factors, beliefs, and attitudes were aligned to produce the intention for PDE. To that end, the IFC study intervention was designed to influence participant real-time choices affecting execution of intended behaviors rather than other precursors to behavior.

Behavioral economics research has demonstrated that when individuals are faced with complex, uncertain, and time-delayed outcomes associated with a decision, they are likely to use decision-making shortcuts that may defy their intentions (Thaler & Sunstein, 2009). In these cases, building awareness of services or resources that can help individuals achieve a behavior is unlikely to produce the intended behavior. The problem in these cases is not the lack of awareness of, value for, or intention for action, but rather the real-time decisions that place value on particular options. In the case of PDE, students must make incremental choices to prioritize preparation for a long-term outcome that does not immediately contribute to their current life demands. They must be willing to take risks and put themselves into uncomfortable situations, such as interacting with recruiters at job/internship fairs, which lack the structure and certainty of their academic experiences.

Based on this insight, the IFC study intervention differentiated the text messages the treatment and control groups received. The treatment group received text messages that include resource information plus choice framing that attempted to influence real-time decisions to act. The control group received text messages that included only resource information. Text messages were chosen as the primary communication method because of the method's relevance to young adults. As was described in the literature review, 100% of 18-29 year olds have cell phones, including the 94% that own smart phones (Pew Research, 2018). 58% of teens with smartphones chose text messaging as the primary method of communicating with friends (Lenhart, 2015) and 55% of teens communicate with friends daily through text messaging, a rate that is double the rate of any other form of communication with friends (Pew Research, 2015). Furthermore, text messages allowed the researcher to facilitate a cue that could prime participant connection of a real-time choice to their intention.

The second research question explored the effect of background factors that could affect pre-intention factors associated with behavior. It is beyond the scope of this study to measure all background factors; however, the most commonly evaluated demographic background factors were assessed along with those most related to this study. The source of these data, the campus' student data management system, was expected to provide valid data to this study.

The goal of the third research question was to determine if perceived behavioral control affected student PDE. Perceived behavioral control is described by Fishbein and Ajzen (2010) as measuring the same construct as self-efficacy, which influences

confidence in the positive outcome of an intended behavior and the willingness to invest in that behavior. Questions 8 to 13 of the pre- and post-intervention surveys reflected the IFC's learning goals and were adapted from the Job Search Self-efficacy Scale (Saks, Zikic, & Koen, 2015). The Job Search Self-efficacy Scale has been shown to be a valid and reliable predictor of job search intention, behavior, and outcomes. Because the questions have been modified only slightly to correspond to learning goals for the IFC study intervention, it is anticipated data collected with these questions will result in valid reliable measurement of perceived behavioral control.

The fourth research question examined the effects of actual control factors as defined in the Theory of Reasoned Action. The literature review described the potential effects of actual control factors, including skills, abilities, and environment, on the completion of an intended behavior. These actual control factors may have differed among participants in this study, which may have resulted in PDE differences. Though the questions 14 to 16 of the pre- and post-intervention survey were self-reported, they are simple questions that were validated during the initial survey development and were likely to elicit valid responses.

Research Setting

San José State University (SJSU) was selected as a setting for this study because it facilitated exploration of barriers to PDE for a range of student demographic profiles. SJSU is a public, master's college with a highly diverse enrollment of roughly 28,000 undergraduate students and 5,000 graduate students (SJSU: Institutational Effectiveness & Analytics, 2017). Fall 2017 enrollment was composed of no ethnic or racial majority;

however, the largest ethnic minority group was Asian at 41%. The percentages of males and females on campus were 52% and 48%, respectively. Age is another area of campus diversity in that 19% of 2017 undergraduates were age 25 and older. Among undergraduates, 80% were enrolled full-time and 51% lived in the county. Another 26% of undergraduates lived in surrounding counties. Only 17% of students lived on, walked to, or biked to campus; the remainder used other forms of transportation to commute to campus and nearly 40% commuted 10 miles or more to campus (Associated Students of San Jose State University, 2017).

In the 2016-2017 Spartan First Destination Survey, a career outcomes survey of recent graduates, 94% of SJSU graduates indicated that they planned to go to work after college (SJSU Handshake, 2017). Alternative responses that could be selected on the survey were volunteering, military, continuing education, fellowship, and not seeking. Assuming future graduating cohorts at SJSU have similar employment plans, it is critical that students integrate PDE throughout their college experience to be ready for the college-to-work transition.

All sophomores and juniors on the SJSU campus were invited to participate in this study. On the 2016-2017 Emerging Careers Survey, SJSU's annual survey of student employment and career goals, 72% of the 1,301 sophomore and junior respondents noted that obtaining an internship—a critical aspect of PDE—was a career-development goal for the year (SJSU Handshake, 2017). Though SJSU sophomores and juniors largely indicated that they want to secure an internship, their PDE has not reflected those intentions. For example, in the 2017-2018 academic year, employers made over 8,000

internship postings in SJSU Handshake, the campus' student job board. In contrast, only 1,162 sophomores and juniors submitted 4,116 applications for those internships. In the same year, SJSU sophomores and juniors combined constituted roughly 29% of the participants in career advising appointments, 13% of the participants in career education workshops, and 11% of the job/internship fair attendees.

These PDE levels may reveal that SJSU sophomores and juniors are investing insufficient time in professional development and may be underprepared for the college-to-work transition when they reach senior year. Estimates from SJSU's 2018 graduate career outcomes survey are that 67% of responding graduates had secured at least one internship or similar experience during college (SJSU Handshake, 2018). The actual level of SJSU students completing at least one internship likely is much lower, given the potential for self-selection bias associated with responses to the graduate career outcomes survey.

San José is located in the Silicon Valley region of California, which is renowned for employment opportunity in the technology industry. Though software development is projected to produce the most openings, among the 50 occupations projected to have the most job openings in the county through the year 2024 are marketing, architecture, nursing, and accounting (Labor Market Information Division, 2016). 42% of the high-demand occupations require workers with college degrees. Demand for college-educated workers in California is projected to outpace the number of anticipated college graduate residents in the state by over 1 million (Johnson, Cook, & Cuellar Mejia, 2017).

The current unemployment rate in the region is between 2.5% and 2.9%, which is well below the 4% standard economists use to indicate full employment (Labor Marketing Information Division, 2018). The heated economy in the region has drawn new residents and led to exceptionally high housing costs. The median rent for a two-bedroom apartment in June 2018 was $2,610 (Hansen, 2018). To manage college costs and high living expenses, many SJSU students may feel the need to generate income during college. When combining the demands of work with the typical commute times of area students, it is possible that students prioritize these time demands over a distant career opportunity payoff associated with investment in PDE.

At SJSU, student PDE is mandatory in select degree programs that require practicums, such as teaching credential programs, and in all programs within the College of Health and Human Services, which requires graduates to have completed an internship. Though the literature review described that establishing choice defaults is an effective behavioral economics technique to influence status quo bias, currently there are no campus-wide requirements for student professional development. Research in behavioral economics has shown that attempting to build engagement through resource promotion alone is unlikely to succeed in cases involving decisions fraught with uncertainty, complexity and time-delay.

For example, for SJSU's fall 2018 Business/Government Job & Internship Fair that is open to all undergraduates and provides a range of opportunities from 60 diverse employers, 25,803 undergraduate students received the final of three emails promoting the fair and 7,429 of them opened that email. Beyond emails, several strategies were

used to promote the fair, including campus digital signage, social media, an ad in the campus newspaper, a large banner at the campus entrance, several large sandwich boards with posters and numerous flyers distributed through campus. The incentive to skip the line by completing a job fair preparation workshop also was offered. Despite all the investment in promotion, only 633 (2%) of all eligible undergraduate students chose to attend the fair (SJSU Handshake, 2018).

By focusing the study and intervention on sophomore and junior participants who intended to find internships, the researcher hoped to learn more about the barriers and facilitators that exist for investment in professional development throughout their college careers. Of particular interest was the possibility of learning how behavioral economics techniques could be employed.

Participants

All rising SJSU sophomores and juniors with at least 30 credits, but no more than 90 credits were invited by the researcher to participate in the study and intervention, which was promoted as the Internship Fitness Challenge (IFC). SJSU Handshake student data regarding degree level and year will be used to verify student year and invite students to participate through a system enote.

Based on 2017 enrollment data, there were 27,778 undergraduate students at SJSU. Of those, it could be assumed that roughly 13,889 were sophomores and juniors. To achieve a 95% confidence level for analyzing the impact of the text-message intervention on the campus' population of sophomores and juniors, roughly 750 total students divided between the treatment and control groups would have to have remained engaged in the

intervention. The sample retained for this study was 346, with 174 in the control group and 171 in the treatment group.

The study began with 375 registered participants. Over the course of the 12-week intervention, 30 participants opted out of receiving the intervention text messages and were removed from the data. 345 participants were retained throughout the study, with 171 and 174 remaining in the treatment and control groups, respectively. Table 2 provides a summary of the demographic groups represented in the treatment, control, and overall groups as well as a comparison to the campus population percentages.

Table 2

Crosstabulation of Demographic Sample by Experiment Group

Group	Treatment		Control		Undergraduates
	n	*%*	*n*	*%*	*%*
Gender					
Male	88	51.5	86	49.4	48.4
Female	83	48.5	88	50.6	51.6
Race/Ethnicity					
Asian/Asian-American	97	56.7	103	59.2	40.8
Black or African-American	7	4.1	9	5.2	3.4
Latino(a)	37	21.6	28	16.1	30.4
Native American/Pacific Islander	0	0.0	2	1.1	.6
White/Caucasian	21	12.3	18	10.3	15.5
Not specified	9	5.3	14	8.1	9.3
Age					
25 and Younger	146	85.4	145	83.3	81.5
Older than 25	25	14.6	29	16.7	18.5

Student residency status was not specified as a factor that would be examined in this study. Yet, 58 (16.5%) of the study's participants were international students compared to 6% of undergraduate enrollment of international students (San Jose State University Institutional Effectiveness and Analytics, 2019). Fifty-one (87.9%) of the international students in this study were of Asian/Asian-American ethnicity.

Table 3 offers a summary of the colleges and student years represented in the treatment, control, and overall groups as well as a comparison to the campus population percentages. During this study, three participants who were originally classified as juniors and were invited to join the IFC intervention became classified as seniors based on units of course completion. They were retained as participants in the study, but were excluded in analyses comparing sophomore and junior PDE.

Table 3

Crosstabulation of College and Year Sample by Experiment Group

	Treatment		Control		Campus
	n	%	*n*	%	%
College					
Business	49	28.7	48	27.6	18.7
Education	2	1.2	2	1.1	3.0
Engineering	45	26.3	44	25.3	17.9
Health and Human Services	17	9.9	19	10.9	16.3
Humanities and the Arts	6	3.5	7	4.0	12.3
Science	25	14.6	27	15.5	9.1
Social Sciences	22	12.9	20	11.5	16.2

(continued)

	Treatment		Control		Campus
	n	%	*n*	%	%
Undeclared	5	2.9	7	4.0	6.6
Year					
Sophomore	38	22.2	38	21.8	16.2
Junior	130	76.0	134	77.0	30.8
Senior	3	1.8	2	1.1	53.0

Sources of Data

The data collection for this study involved existing student record data, captured student engagement data, and self-reported engagement and perception data. A full list of data structure, sources, and coding appears in Appendix J. To begin the data collection process, select data from student education records and demographics were gathered through reports from PeopleSoft, the campus' student data management system. Second, PDE in SJSU's CSO services and events was captured by student ID for each participating student in the department's career management and digital career learning systems, including SJSU Handshake, Focus2, and Big Interview. The protocols for collecting PDE data varied based on the format of the service. In some cases, participants provided their student identification cards to event or service facilitators for entry in the system. For the self-service systems, including Focus2 and Big Interview, administrative reports were downloaded to reveal participant activities completed on their own. Third, participant self-reported data on PDE activities, perceived behavioral control, and actual control were gathered via the pre- and post-intervention surveys using Qualtrics. The pre- and post-intervention surveys are shown in Appendix G.

After the full intervention and survey processes were completed, data on participant PDE associated with the IFC elements and survey responses were downloaded from the digital systems. Those data were merged into a password-protected spreadsheet that was used to store all the data associated with this study.

The researcher serves as the SJSU CSO director. Therefore, access to student engagement data already managed by the department in SJSU Handshake, Focus2, and Big Interview is inherent in running the operations associated with the role. Access to other data from Peoplesoft identified in Appendix J has been granted to the researcher by the registrar and the director of SJSU's Institutional Effectiveness and Analytics department.

Protection of Human Subjects

Several measures were taken to protect participants from risk associated with the study. First, participant consent was obtained during the intervention registration process with a Qualtrics survey form of an informed consent notice and study registration, which is shown in Appendix E. During the consent and registration process, effort was made to ensure that students recognized the optional nature of their participation. In the role of CSO director, the researcher rarely provides direct services to potential participants. Because of this distance between the researcher and participants, perceived coercion of participants was highly unlikely. Yet, the researcher acknowledged the potential coercion students may experience from receiving an invitation to engage in the study by the director of the CSO. In all recruitment and data collect materials, the optional nature

of engagement as well as the fact that career services are available outside this study was articulated.

Second, measures were taken to ensure the anonymity and confidentiality of participants. Unless a participant requested additional assistance related to the intervention, there was no instance when the researcher revealed the identity of a participant to someone not affiliated with the study. The committee chairperson and second committee member are current faculty at SJSU and may have unknowingly taught or advised participants in the intervention, but were not likely to have interacted directly with them outside of the study for career services-related purposes.

No identifiers indicating that a particular student was a study participant were revealed to career center staff members. It is a regular protocol of the SJSU CSO to shred documents with any student personal data, including student identification numbers, to ensure student privacy. Therefore, there was no distinction between the ways SJSU career center staff served study participants versus the ways they serve all students who use campus career services.

The only exception to the researcher's plan to maintain participant confidentiality was that the researcher serves as a mandated reporter when working with minors. In the event that a minor participant had revealed that they were being harmed or intended to harm themselves or others, the researcher would have be required to report that information to authorities.

A third risk associated with participation in this study was the possibility that a student's demographic data, survey responses, and/or PDE data would be revealed

inadvertently during the study. Given the data-collection and security procedures described in the following paragraphs, the likelihood of such data exposure was very low. Furthermore, the digital systems used to capture student PDE data require administrator login credentials to access student data. Storage and sharing of the data and data analysis was done only through password-protected documents, hardware, and software. No raw, disaggregated, or personal data was shared with anyone not associated with this study.

A final risk to participants involved engagement in activities associated with the intervention. This study's intervention promotes career services and events that are available to any San José State University sophomore or junior. The risks associated with this study are minimal, however, all engagement in professional development activities involves some level of risk. It was possible that during this study, a participant could have experience psychological distress from being encouraged to engage in professional development while managing other life commitments. The likelihood of psychological distress rising to a level that affected functioning was very low. Because all activities associated with this study occurred on the SJSU campus, first aid and emergency services were immediately available to respond to students in distress. Counseling therapeutic treatments also could be arranged to resolve long-term impacts associated with the study.

Procedures

The Internship Fitness Challenge (IFC) was designed as a large-scale, low-cost intervention to influence real-time decisions regarding PDE. All communications, though distinct for the treatment and control groups, were sent simultaneously to all study participants. The following IT applications were used to distribute communications: SJSU Handshake for email communication, Qualtrics for survey data collection, and TXT 180 for text-message communication. With the exception of students contacting the researcher directly by phone or email with questions or concerns, all forms of communication associated with this study involved email or text messaging.

Intervention recruiting. Recruiting for the IFC occurred from August 19, 2018 to September 1, 2018 and involved several methods. First, printed recruiting flyers, shown in Appendix C, were distributed at CSO events and numerous student service centers. The same flyers were sent through email to college administrators and select faculty and staff. Three reminder emails were sent to students, faculty, and staff. Also during this period, the IFC invitation, shown in Appendix D, was sent through SJSU Handshake to all matriculated sophomore and junior students with at least 30 and no more than 89 completed units of coursework. An event listing with a registration deadline also was posted in SJSU Handshake and made visible to all sophomore and juniors. As was described in the invitation email, an incentive was provided to participants to complete the full program, which required them to receive text messages for the full length of the IFC and complete both the pre- and post-intervention surveys.

Pre-intervention survey and data preparation. The invitation email and event listing shown in Appendix D contained a link to a Qualtrics survey form shown in Appendix E. This pre-intervention survey gathered informed consent notice confirmation, participant name and cell phone number, and pre-survey question responses as indicated in Appendix G. At the close of the intervention registration period, participant registration data and survey responses were downloaded and merged into a password-protected data preparation Excel spreadsheet on the researcher's encrypted DropBox account. To enable the researcher to gather reports on participation and send the welcome and thank you emails, shown in Appendices F and G, the researcher collected student email addresses and student identification numbers from SJSU Handshake to merge into the data preparation Excel spreadsheet.

Students who registered for the IFC, acknowledged the consent notice, and completed the pre-intervention survey were assigned to the treatment or control groups. The researcher used stratified random sampling to assign students to a group. The sample was stratified to achieve roughly equal composition in the treatment and control groups along the dimensions of college, college year, and gender. This sampling approach facilitated analysis of research questions two and four, which explored the effects of background factors and ability/capacity factors on PDE, respectively. Also on September 2, 2018, the text message treatment and control groups were established in the SMS-marketing application TXT180℠. Only participant cell phone numbers were entered in the TXT180℠ application to enable the researcher to send text messages to participants.

Intervention. The IFC study intervention operated as a mobile, one-way coaching service to encourage participants to engage in the PDE opportunities offered by the CSO at SJSU. In essence, the intervention consisted of 2 to 3 text messages sent each week to both the treatment and control groups. With the exception of text message communications included in this intervention, all services and resources associated with the intervention were available to all SJSU students and alumni as a matter of the regular CSO program and event offerings.

On September 1, 2018, participants received the IFC welcome email shown in Appendix F. This email gave an overview of the IFC, including the program goals and alternative methods for meetings those goals if scheduled events did not fit into participants' calendars. On September 3, 2018, the 12-week IFC intervention began with the first text message sent to participants. A detailed schedule and scripts for the text messages appears in Appendix I. The treatment group received text messages that were designed to influence real-time decision-making heuristics and provide information on PDE resources available within the week. The control group received derivative text messages that provided only information on PDE resources available within the week. The final intervention text message was sent on November 21, 2018.

Post-intervention survey. On November 25, 2018, the IFC thank you email, shown in Appendix H, was sent to all participants through SJSU Handshake. Within that email, the link to the post-intervention survey Qualtrics form was embedded. The post-intervention survey questions appear in Appendix G. Participants who did not respond

received up to three text and email reminders to complete the survey by December 8, 2018.

At the close of the IFC post-intervention survey period, survey responses were downloaded and merged into the password-protected data preparation Excel spreadsheet that contained all the study's data and was stored on the researcher's encrypted DropBox account. The full list of data and the associated sources are described in Appendix J. The merged records were made anonymous by assigning random identifiers to participant records and removing any personal identifiers, including name, email, cell phone number, and student identification number. The anonymized data were reviewed and cleaned for response format consistency and removal of outliers. Student cell phone numbers were removed from the TXT180 system no later than March 31, 2019. All other student data that are typically stored in secondary source systems remains in those system and are secured through current campus data security standards. In the following paragraphs, the data coding and analysis plans for each research question are described.

Data Coding and Analysis

The research questions for this study were as follows:

1. Can a text-message intervention designed to influence real-time decision-making in sophomore and junior internship-seekers affect their level of PDE?
2. Do PDE levels differ due to student background factors as defined in the Theory of Reasoned Action, including demographic and experiential factors?
3. Do PDE levels differ due to perceived behavioral control as defined in the Theory of Reasoned Action?

4. Do PDE levels differ due to actual control factors as defined in the Theory of Reasoned Action, including ability/capacity and college environment factors?

To begin analysis, the cleaned and anonymized data were uploaded into Statistical Package for Social Sciences (SPSS). All statistical analyses were performed using SPSS. To prepare to analyze the first research question, all PDE activities were organized into six scores that represent the nature of the activity. PDE input 1 was defined as educational activities, which are shown as variables 1.2 to 1.8 in Appendix J. A score for PDE input 1, variable 1.9, was computed by coding each activity based on the estimated hours required and then adding the total hours of each activity. Similar time-investment scores were developed for PDE input 2 (networking and mentoring activities), PDE input 3 (measured internship-search activities), and PDE input 4 (self-reported internship-search activities). Those computed variables 1.13, 1.19, and 1.22, respectively, are shown in Appendix J. Because the item of number of applications submitted could have been counted in both measured and self-reported internship-search groups, PDE scores 3 and 4 were kept as separate scores of activity intensity. PDE output 5 and PDE output 6 (variables 1.23 and 1.24) were structured as distinct, measures of internship-search outputs, including number of internship offers received and accepted.

To analyze the first research question, a comparison of the post-intervention PDE scores of the treatment and control groups began with calculating the mean and standard deviation PDE level scores 1 to 6 for each group. Differences in PDE scores 1 to 6 between the groups were calculated with independent samples t-tests for PDE scores 1-5 and a chi-square test of independence for PDE score 6, which is a nominal variable. To

determine the effect size of treatment- and control-group interventions on PDE levels, Pearson's r for PDE scores 1 to 5 and chi-square tests of independence for PDE score 6 were calculated. Differences in PDE scores 1 to 4 between those who had accepted an internship versus those who had not (represented in PDE score 6), were evaluated with an independent samples t-test for all groups.

Analysis for the second research question began with a calculation of PDE score means and standard deviations across the background factors. To compare PDE score differences across gender, ethnicity, generation in college, first entry in college (first-time freshman versus transfer student), year in college, previous training, and previous SPO membership, independent samples t-tests and one-way analysis of variance (ANOVAs) were calculated for PDE scores 1-5 and chi-square tests of independence were calculated for PDE score 6. To explore the differences in demographic and experiential background factors across demographic groups, cross tabulation and chi-square tests of independence were calculated.

To compare PDE scores across age groups, the age data were organized into a group of participants aged 25 and younger and a group of participants older than 25. These groupings were defined to distinguish between students who started college directly after high school and could take up to six years to complete their degree versus those that started college later and or had taken longer than six years to finish their degree. Differences in PDE scores for these two age groups were compared using independent samples t-test for PDE scores 1 to 5 and chi-square tests of independence for PDE score 6. An analysis of PDE scores based on the relationship of a participant's current work to

their career goals was facilitated by organizing responses into a group of participants that agreed their work was related to their career goals versus those that disagreed. Then, an independent samples t-test for PDE scores 1 to 5 and a chi-square test of independence for PDE score 6 were calculated for these two groups.

For the second research question to compare PDE scores across demographic and experiential background factors, most data were converted into nominal variables. One exception to this conversion was interval variable 4.3 for age, which is an interval variable. A second exception was for variable 4.10 which captured participant responses on the intensity of the relationship between their current employment and their career goals. Variable 4.10 was converted from ordinal text responses to numeric values ranging from a value of 1 for a survey response of *Strongly disagree* to 4 for a response of *Strongly agree*.

To evaluate the third research question on the effect of perceived behavioral control on PDE, computed scores 2.7 and 2.17 were created. To facilitate this scoring, responses for variables 2.1 to 2.6 and 2.11 to 2.16 were converted to numeric values ranging from a value of 1 for a survey response of *Strongly disagree* to 4 for a response of *Strongly agree*. Interval scores 2.7 and 2.17 were computed by adding these numeric values for the pre- and post-intervention survey responses.

After perceived behavioral control scores were computed, pre- and post-intervention perceived behavioral control score means and standard deviations were calculated for the treatment, control, and overall groups. To explore the impact of the intervention on perceived behavioral control, a paired sample t-test was calculated to compare the pre-

and post-intervention perceived behavioral control scores for the treatment and control groups. Also, an independent samples t-test was calculated to assess the difference in post-intervention perceived behavioral control scores between the treatment and control groups.

To evaluate the difference in PDE scores 1 to 5 between participants who reported positive and negative pre-intervention perceived behavioral control scores, the overall group was divided into participants who indicated pre-intervention perceived behavioral control scores of 3 or higher versus those who reported scores below 3. A pre-intervention perceived behavioral control score of 3 or higher would reveal that the participant generally was confident they could perform the six learning outcomes associated with the intervention. Then, independent samples t-tests were calculated for all groups. To assess the difference in PDE score 6 between participants with positive and negative pre-intervention perceived behavioral control scores, chi-square tests were calculated for all groups.

To explore differences in pre- and post-intervention perceived behavioral control scores across the demographic factors of gender, age, and ethnicity, several independent samples t-tests and one-way ANOVAs were calculated for all groups. To explore differences in pre- and post-intervention perceived behavioral control scores across experiential factors of generation in college, first entry into college, previous internships, relationship of current work to career goals, previous training on internship-searching, and previous membership in SPO, additional independent samples t-tests were calculated.

For the fourth research question to explore the effect of ability/capacity and environment factors affecting actual control on post-intervention PDE scores, much of the data were converted into dichotomous variables to facilitate analysis differences in group means. SJSU's Registrar's Office's definition of enrollment status was used for this study and indicates that part-time status is equal to or less than 6 units and full-time status is greater than 6 units (San Jose State University, 2019). Responses to the pre-intervention survey question on primary reason for employment were computed to form nominal variables 3.36 and 3.37, which enabled the analysis of differences in PDE levels based on whether the participation was employed to generate nondiscretionary income, discretionary income, or work experience. Responses for variables 3.5 and 3.6 regarding participants' perceptions of time limits and feelings of being overwhelmed were converted to numeric values ranging from a value of 1 for a survey response of *Strongly disagree* to 4 for a response of *Strongly agree*. When sample sizes for colleges were sufficiently large to make a distinction among majors within a college, student major data were organized in meta-majors nominal variables 3.71 to 3.711, which allowed comparison of PDE differences across groupings of similar majors. In the situations where college sample sizes were low, the college level grouping was retained as the unit of comparison.

To evaluate the effect of actual control factors on PDE scores, mean and standard deviation for the treatment, control, and overall groups were calculated for all the ability/capacity and environment factors listed as variables 3.1 to 3.88 in Appendix J. Subsequently, independent samples t-tests and one-way ANOVAs were used to analyze

differences in PDE scores 1 to 5 across the factors and groups. Chi-square tests of independence were used to analyze differences in PDE score 6 across the factors and groups. In addition, to explore the differences in meta-major between genders and ethnicities, cross tabulation and a chi-square test of independence were calculated for the overall group.

A comparison of PDE scores by typical weekly hours of work was facilitated by defining a group working 20 or fewer hours and one working more than 20 hours. To explore differences in work status by ethnicity, work hours were converted into a nominal variable comparing responses of 0 to responses higher than 0. Then, a chi-square test of independence was calculated. A one-way ANOVA was calculated to assess differences in hours worked across ethnic groups. To explore differences in reason for working by ethnicity, a chi-square test of independence was calculated.

A comparison of PDE scores by commute time was facilitated by creating two groups, one with average or lower commute times and one with higher than average commute times. The average commute time to SJSU in minutes is 35 minutes (Zonobi, 2019). To evaluate PDE score differences based on perceptions of time limitations for engagement in campus activities and sense of being overwhelmed, responses were divided into groups who agreed that time limitations and perception of being overwhelmed created a barrier to engagement versus those who did not. Subsequently, independent samples t-tests were calculated to compare these groups.

Background of the Researcher

The researcher has served as the director of the SJSU CSO for nearly three years and in career services at SJSU for five years. She began working in career services as an undergraduate at the University of Michigan, leading a program to help students find and prepare for internships. In these roles, she has sought to understand how to design engaging and effective services for the large proportion of students who struggle to prepare for the college-to-work transition.

After completing her undergraduate degree, she worked for fifteen years in corporate talent development and information technology, managing global program teams implementing change initiatives. During her work in industry settings, she completed a master's degree in human resources and organization development. After a transition to nonprofit work and completing a master's degree in counseling with research on student dropout behaviors, she refocused her career on academic and career success leadership in higher education. These experiences enabled her to acquire a toolkit for designing human-development and organization-development interventions and implementing large-scale change.

Chapter Four: Findings

Overview

This chapter reveals the results of data analyses for this study's four research questions. Table 4 offers a summary of the PDE scores that first were computed and then were evaluated throughout this study. For concision, PDE scores are referenced by number throughout this chapter. PDE scores 1 to 4 measured input behaviors that were within the control of the participants to execute. PDE scores 5 and 6 measured outputs of participant investments in activities represented by PDE scores 1 to 4; these outputs were not in the direct control of participants.

Table 4

Summary of Professional Development Engagement (PDE) Scores

Number	PDE Score	Score Type	Variables in Appendix J
1	Career-/professional-development education	Input	1.2 to 1.9
2	Networking and mentoring	Input	1.10 to 1.13
3	Measured internship-searching	Input	1.14 to 1.19
4	Self-reported internship-searching	Input	1.20 to 1.22
5	Number of internship offers received	Output	1.23
6	Internship offer accepted	Output	1.24

Analyses for the first research question were focused on understanding the effect of the behavioral-economics-informed, text-message coaching intervention on student PDE scores in the treatment group. The second, third, and fourth research questions explored alternative explanations for differences in PDE scores based on behavior antecedents defined in the Theory of Reasoned Action, including background factors, perceived

behavioral control, and actual control factors. In the following sections, the results of analyses for each research question are detailed.

Findings

Research question one: Can a text-message intervention designed to influence real-time decision-making in sophomore and junior internship-seekers affect their level of PDE? Participant PDE opportunities were offered throughout the 12-week IFC intervention. The treatment group received text-messages intended to influence ability/capacity and environment factors of actual control over PDE. The control group received text-messages intended to influence only ability/capacity factors of actual control over PDE. Table 5 shows that treatment group mean PDE scores 1 to 4 were higher than control group scores, but not significantly so. Control group mean PDE scores 5 and 6 were higher than treatment group scores, but not significantly so.

Table 5

Results of Independent Samples t-tests and Descriptive Statistics for PDE levels by Experiment Group

	Experimental Group						95% CI for Mean Difference		
	Control			Treatment					
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*
PDE inputs scores									
1. Education	.86	1.69	174	.93	1.76	171	-.44, .29	-.39	343
2. Networking and mentoring	1.23	2.71	174	1.69	3.36	171	-1.11, .19	-1.40	343
3. Measured internship searching	2.71	4.15	174	3.29	4.30	171	-1.48, .31	-1.28	343
4. Self-reported internship searching	7.05	7.58	61	7.07	7.43	83	-2.52, 2.47	-.018	142

(continued)

	Experimental Group						95% CI for Mean Difference		
	Control			Treatment					
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*
PDE output scores									
5. Number of internship offers received	.38	.83	58	.27	.50	83	-.13, .36	.93†	85
							p	X^2	*df*
6. Internship offer accepted	.15	.36	61	.13	.34	83	.80	.07	1

† Satterthwaite approximation employed due to unequal group variances.

Results indicate that the treatment group intervention had a weak positive effect on PDE inputs, which are behaviors in participants' direct control; the control group intervention had a weak positive effect on PDE outputs, which are outcomes not within participants' direct control. Weak positive, but not significant, correlations were found between the treatment group and the following PDE scores: PDE score 1, $r(344) = .02$, $p = .70$; PDE score 2, $r(344) = .08$, $p = .16$; PDE score 3, $r(344) = .07$, $p = .20$; and PDE score 4, $r(344) = .002$, $p = .99$. Weak positive, but not significant, correlations were found between the control group and PDE score 5, $r(140) = .09$, $p = .31$, and PDE score 6, $X^2 (4, N = 141) = 6.27$, $p = .18$.

Viewing the PDE scores for the overall group offered one unique insight. Comparing the mean PDE score 4 for the eleven students who accepted internship offers ($M = 10.85$, $SD = 6.84$) with those who did not accept offers ($M = 6.45$, $SD = 7.41$), PDE score 4 means were significantly higher, M=-4.40, 95% CI [-7.82, -.98], $t(142) = -2.49$, $p = .01$.

Standard deviations for PDE scores were large. Analysis of the data distribution indicated that all PDE scores were highly right-skewed. This pattern of engagement was

found in both the treatment and control groups. Despite multiple opportunities and modalities for engagement, 60% of the participants engaged in no career and professional development education (PDE score 1) offered by the CSO. 30% engaged in no measured internship-searching activities (PDE score 3). The 90th percentile PDE 3 score was over 5 times the median level of engagement in this activity. Eleven students in this study accepted internship offers, which was represented in PDE score 6.

The treatment intervention produced weak positive, but not significant effects on student PDE. The following research question results offer insight into other factors that affected student PDE. These factors progress through antecedents of behavior defined in the Theory of Reasoned Action. First, results of the second research question reveal the impact of demographic and experiential background factors on PDE. Second, results of the third research question indicate the impact of perceived behavioral control on PDE. Finally, results of the fourth research question will show the impact of actual control factors, specifically ability/capacity and environment factors, on PDE.

Research question two: Do PDE levels differ due to student background factors, including demographic and experiential factors, as defined in the Theory of Reasoned Action? Participant demographic and experiential background factors were captured during his study to examine the effects of such factors on PDE scores. Demographic background factors included gender, age, and ethnicity. Experiential background factors included generation in family to attend college, first entry on campus (first-time freshman or transfer student), year in college, previous training on internship-searching, previous membership in a student professional organization (SPO), number of

previous internships completed, and current work related to career goals. Results of PDE scores by demographic and experiential background factors are detailed in the following sections.

Demographic background factors and PDE. Mean PDE scores 1 to 4 were higher in males; mean PDE scores 5 and 6 were higher in females. Mean PDE score 3 (measured internship-searching) was significantly higher for males (M = 3.57, SD = 4.65) than for females (M = 2.42, SD = 3.68), M=1.16, 95% CI [.27, 2.04], $t(328) = 2.57$, $p = .01$. There were no observable patterns in the means and no significant differences in PDE scores for students age 25 and younger versus those older than 25.

Across ethnic groups, PDE score 3 was significantly different, Welch's $F(3, 9.89) = 7.75$, $p < .001$. The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances (p=.001). Data are presented as mean ± standard deviation. Games-Howell post hoc analysis revealed that PDE score 3 was significantly higher among Asian/Asian-American participants (M = 3.75, SD = 4.57) than Latino(a) participants (M = 1.71, SD = 2.62), a mean difference of 2.03, CI [.76, 3.30], which was statistically significant (p = .001). Only two Native American/Pacific Islander students participated in this study. Therefore, a comparison PDE scores for this ethnic group was not possible.

Chi square tests revealed no significant differences in the age (2 x 5) and gender composition (2 x 5) of the ethnic groups.

Experiential background factors and PDE. In the following paragraphs, the analysis of PDE scores across experiential background factors are reported. Among second-

generation students, all mean PDE scores 1 to 4 were higher than those for first-generation students. Mean PDE score 3 (measured internship-searching) was significantly higher for second-generation students (M = 3.64, SD = 4.96) than for first-generation students (M =2.22, SD = 3.07), *-1.42*, 95% CI [.45, -2.30], $t(307) = -3.19$, $p = .00$.

For transfer students, mean PDE scores 1, 3, 4, 5, and 6 were higher than those for first-time freshman. Mean PDE score 1 (career- and professional-development education) was significantly higher for transfer students (M = 1.03, SD = 1.81) than for first-time freshman students (M =.66, SD = 1.28), M=-.37, 95% CI [.17, -.70], $t(336) = -2.19$, $p = .03$.

For juniors, all mean PDE scores were higher than those for sophomores. Mean PDE score 1 (career- and professional-development education) was significantly higher for juniors (M = 1.00, SD = 1.85) than for sophomores (M =.59, SD = 1.19), M=-.41, 95% CI [-.76, -.06], $t(189) = -2.32$, $p = .02$. Mean PDE score 4 (self-reported internship searching) was significantly higher for juniors (M = 7.89, SD = 7.78) than for sophomores (M =3.57, SD = 4.87), M=-4.31, 95% CI [-6.66, -1.97], $t(65) = -3.68$, $p = .00$.

There were no significant differences in PDE scores between participants who indicated they had completed previous training in internship-searching, had completed at least one internship, or were working in a role related to their career goals versus participants who did not report such experiences.

For participants with work related to their career goals, mean PDE scores 1 to 4 were higher, but not significantly so, when compared to students who did not have that

experience. For participants who had been previous SPO members, mean PDE scores 1 to 5 were higher, but not significantly so, than for those who had not had SPO experience.

Demographics of groups with common experiences. Asian/Asian-American students were significantly more represented among second-generation students, X^2 (1, N = 309) = 14.00, $p < .001$, and first-time freshman students, X^2 (1, N = 321) = 5.87, $p = .02$. Latino(a) students were significantly more represented among first-generation students, X^2 (1, N = 309) = 36.58, $p < .001$. There was no significant difference in representation across ethnic groups based on year in college. Chi-square tests to compare representation of ethnic groups across the experiential background factors of previous training on internship-searching, previous membership in a SPO, previous internships, and current work related to career goals did not reveal any significant differences across the demographic groups. Low sample size (n = 2) prevented exploration of Native American/Pacific Islander participants across these factors.

Research question three: Do PDE levels differ due to perceived behavioral control as defined in the Theory of Reasoned Action?

Perceived behavioral control and PDE. Perceived behavioral control scores were measured before and after the IFC intervention. A perceived behavioral control score equal to or greater than 3 indicated that a participant either agreed or strongly agreed that they were confident in their ability to perform the six IFC learning outcomes. A perceived behavioral control score below 3 indicated that a participant either disagreed or strongly disagreed that they were confident in their ability to perform the six IFC learning outcomes. Table 6 shows that participants with pre-intervention perceived behavioral

control scores equal to or greater than 3 showed higher mean PDE scores 1 to 6 than those with pre-intervention perceived behavioral control scores below 3. Mean PDE score 3 in the overall group was significantly higher in those with pre-intervention perceived behavioral control scores equal to or greater than 3. A positive pre-intervention perceived behavioral control score appeared to have a particularly positive effect on measured internship-searching activities.

Table 6

Results of Independent Samples t-tests and Descriptive Statistics for PDE levels by Pre-intervention Perceived Behavioral Control Scores

	Pre-intervention Perceived Behavioral Control Scores						95% CI for Mean Difference		
	< 3			≥ 3					
	M	*SD*	*n*	*M*	*SD*	*n*		*t*	*df*
PDE inputs scores									
1. Education	1.02	1.72	158	1.21	2.44	71	-.45, .82	.59†	102
2. Networking and mentoring	1.67	3.34	158	2.51	3.91	71	-.16, 1.82	1.66	227
3. Measured internship searching	2.93	3.64	158	4.23	4.72	71	.18, 2.43	2.28*	227
4. Self-reported internship searching	7.10	7.54	78	8.20	8.13	35	-2.02, 4.21	.70	111
PDE output scores									
5. Number of internship offers received	.21	.41	77	.51	.98	35	-.04, .66	1.78†	39
							p	X^2	*df*
6. Internship offer accepted	.13	.34	78	.17	.98	35	.50	.45	1

* $p < .05$.
† Satterthwaite approximation employed due to unequal group variances.

Effect of the intervention on perceived behavioral control. A paired sample t-test was calculated to compare pre- and post-intervention perceived behavioral control scores within the experiment groups. Tables 7 and 8 indicate that mean post-intervention

perceived behavioral control scores were significantly higher than mean pre-intervention perceived behavioral control scores for the overall, treatment, and control groups. No significant difference was found in mean post-intervention perceived behavioral control scores between the treatment and control groups. It appears that IFC intervention spurred significant growth in perceived behavioral control scores for students in all groups.

Table 7

Results of Paired Sample t-test and Descriptive Statistics for Pre- and Post-intervention Perceived Behavioral Control Scores

	Overall Group						95% CI for Mean Difference		
	Pre-intervention			Post-intervention					
	M	SD	n	M	SD	n		t	df
Perceived behavioral control	2.59	.57	113	2.96	.54	113	-.49, -.24	-5.72*	112

* $p < .01$.

Table 8

Results of Independent Samples t-tests and Descriptive Statistics for Perceived Behavioral Control Score by Experiment Group

	Experiment Group						95% CI for Mean Difference		
	Control			Treatment					
	M	SD	n	M	SD	n		t	df
Pre-intervention	2.58	.54	46	2.60	.60	67	-.48, -.14	-3.70*	45
Post-intervention	2.89	.49	46	3.00	.57	67	-.57, .22	-4.42*	66

* $p < .01$.

Background factors of groups by perceived behavioral control scores. Differences in pre-intervention perceived behavioral control scores were identified in some demographic groups. Mean pre-intervention perceived behavioral control scores were

found to be significantly lower in participants older than 25 (M = 2.40, SD = .64) compared to those for participants age 25 and younger (M = 2.65, SD = .60), M=-.25, 95% CI [-.47, -.03], $t(227) = -2.24$, p = .03. The same age group comparison for mean post-intervention perceived behavioral control scores showed no significant differences, which implies that perceived behavioral control scores for older participants caught up to those of younger participants. Measuring before and after the intervention, mean perceived behavioral control scores increased 20% for those older than 25, but just 10% for those 25 and younger. No significant differences in mean pre- and post-intervention perceived behavioral control scores were found between gender and ethnic groups.

Differences in pre-intervention perceived behavioral control scores also were identified in groups organized by experiences relating to internship-searching. For participants who reported currently working in a role related to their career goals, mean pre-intervention perceived behavioral control scores were significantly higher (M = 2.81, SD = .57) than those for participants who had not reported this experience (M = 2.58, SD = .57), M=.23, 95% CI [.01, .46], $t(131) = 2.03$, p = .05. No significant differences in mean pre- and post-intervention perceived behavioral control scores were found between first-time freshman and transfer students, first- and second-generation students, sophomores and juniors, students who had completed internships prior to the intervention versus those that had not, and students who were members in an SPO prior to the intervention versus those who were not. It appears that hands-on experience through current work had a positive effect on perceived behavioral control, but all other forms of

experience either did not affect perceived behavioral control or had a negative effect in the case of participants having completed previous training on internship-searching.

Research question four: Do PDE levels differ due to actual control factors, including ability/capacity and college environment factors, as defined in the Theory of Reasoned Action? Several ability/capacity factors of actual control, including enrollment status, weekly hours of work, purpose for working, commute time, perceptions of time limitations and being overwhelmed, and meta-major, were evaluated to identify PDE score differences. The following section offers a summary of the findings on ability/capacity factors and PDE. Analysis on differences in ability/capacity factors by demographic factors are also summarized.

Ability/capacity actual control factors and PDE. For the ability/capacity factor enrollment status, all groups' PDE score means varied for full-time and part-time students, but none were significantly different. It appears that full-time enrollment may foster deeper on-campus engagement for some students, but for other students, part-time enrollment may free more time for PDE.

For the ability/capacity factor weekly hours of work, mean PDE scores 1 to 5 were higher for students working 20 hours per week or less versus those working more than 20 hours per week. Mean PDE score 3 was significantly higher for participants working 20 hours per week or less (M = 3.66, SD = 4.24) versus those working more than 20 hours per week (M = 2.03, SD = 2.90), M=-1.63, 95% CI [-2.72, -.55], $t(87) = -2.99$, $p = .004$.

Participant reasons for working appeared to have distinct effects on their PDE scores. Among working students, the mean PDE score 1 was lower for those who indicated they

were working to generate nondiscretionary income (M = .69, SD = 1.24) versus those who identified other reasons for working (M = 1.35, SD = 2.50), but the difference was not statistically significant. Among the same students, the mean PDE score 3 was lower for those who indicated they were working to generate nondiscretionary income (M = 2.35, SD = 3.14) versus those who identified other reasons for working (M = 3.67, SD = 4.36), but the difference was not statistically significant.

Unlike working for nondiscretionary income, working to generate discretionary income or gain work experience had a somewhat positive effect on participant PDE scores. Among students working to gain work experience, PDE score 3 was higher for students who were working to gain work experience (M = 4.12, SD = 4.49) versus those who identified other reasons for working (M = 2.52, SD = 3.46), but the difference was not statistically significant. In contrast, PDE score 5 was lower for students who were working to gain work experience (M = .10, SD = .31) versus those who identified other reasons for working (M = .42, SD = .79), but the difference was not statistically significant.

PDE score 6 was significantly higher in participants who indicated they were working to generate discretionary income versus those who identified other reasons for working, X^2 (1, N = 68) = 6.11, p = .01. Students who did not need to work to cover living expenses had higher offer acceptances than those who had to work for nondiscretionary income and those who were working to build work experience.

For commute time, mean PDE 1-4 scores were higher for participants with commutes shorter than the average 35-minute SJSU commutes versus those with a greater than

average commute, but generally not significantly so. Below average commute time appears to have a weak positive effect on PDE.

A comparison of mean PDE scores between participants who agreed versus those who disagreed that work and commute hours created time limitations to campus engagement did not reveal significant differences. A comparison of mean PDE scores between participants who agreed and disagreed that they felt overwhelmed due to their responsibilities revealed no significant differences.

Across meta-majors or groupings of similar majors, a comparison of PDE scores revealed a few disparate outcomes. Due to small sample sizes in some majors that did not allow grouping of similar majors that would not completely overlap with the college factor, comparison was limited to five meta-majors from the colleges of business and engineering, including Business/accounting and finance, Business/innovation and management, Business/marketing and business analytics, Computing and information technology, and Engineering. A full list of the majors included in these meta-majors is provided in Appendix J. In the following paragraphs, the statistical test outcomes are described. A brief review of the potential meaning of these outcomes for meta-major differences in PDE is offered following these test outcomes details.

Games-Howell post hoc analysis revealed that mean PDE 3 scores were significantly higher among Computing and Information Technology meta-majors (M = 6.15, SD = 6.44) versus Engineering meta-majors (M = 2.45, SD = 3.16), Welch's $F(8, 34.80) = 6.20$, a mean difference of 3.70, CI [1.39, 6.02], which was statistically significant (p =.001). The assumption of homogeneity of variances was violated, as assessed by Levene's test

for equality of variances ($p<.001$). Data are presented as mean ± standard deviation. Among the group of five meta-majors, participants in the Computing and Information Technology meta-major were the most active in measured internship-searching, while those in the Engineering meta-major were the least active in this PDE dimension. It is possible that abundant high-tech industry opportunities provided a strong incentive to students in directly related majors to actively pursue more internships.

Eleven students in this study accepted an internship offer, which was represented in PDE score 6. To compare PDE 6 scores across colleges, a Fisher's exact test revealed that there were no significant differences in internship offer acceptance rates, $p = .11$. Students in the Business/Accounting and Finance meta-major accepted the most internship offers with four acceptances; students in the Computing and Information Technology meta-major accepted the least internship offers with zero acceptances.

Demographics of groups with common ability/capacity actual control factors. In this sample of working students, Asian/Asian-American students were overrepresented among the non-working participants, X^2 (1, $N = 213$) = 6.62, $p = .01$. In contrast, Latino(a) students were overrepresented among in the working participants, X^2 (1, $N = 213$) = 4.90, $p = .03$. Hours of work per week were statistically significantly different across ethnic groups. There was homogeneity of variances in hours of work reported, as assessed by Levene's test for equality of variances ($p=.94$). Data are presented as mean ± standard deviation. Tukey post hoc analysis revealed that Latino(a) students worked significantly more hours ($M = 14.98$, $SD = 10.97$) than Asian/Asian-American students

(M = 9.21, SD = 11.45), $F(3, 208) = 3.31$, a mean difference of 5.77, CI [.54, 10.99], which was statistically significant (p = .02).

Latino(a) students were significantly overrepresented among participants working for nondiscretionary income, X^2 (1, N = 131) = 4.38, p = .04. Asian/Asian-American students were significantly underrepresented among participants working for nondiscretionary income, X^2 (1, N = 131) = 15.43, p < .001.

Asian/Asian-American students were significantly overrepresented among students working to gain work experience, X^2 (1, N = 131) = 16.36, p < .001. White students were significantly underrepresented among students working to gain work experience, X^2 (1, N = 131) = 5.00, p = .03.

Asian/Asian-American students were overrepresented among students with below average commute times, X^2 (1, N = 206) = 5.43, p = .02. White students were overrepresented among students with above average commute times, X^2 (1, N = 206) = 7.24, p = .01.

Environment actual control factors and PDE. This study's intervention was designed to influence the real-time, decision-making environment, which is a factor of actual control related to PDE. There are innumerable other environment factors of actual control that may have influenced student PDE. For this study, only the participant's college was evaluated to determine if differences in college requirements for internships affected student PDE scores. The following section offers a summary of the significant findings on college environment factor and PDE. Differences in participant demographic factors across the college environment factor are also summarized.

Across colleges, PDE score 3 (measured internship-searching) was significantly different, Welch's $F(6, 35.52) = 14.94$, $p < .001$. The assumption of homogeneity of variances was violated, as assessed by Levene's test for equality of variances ($p<.001$). Games-Howell post hoc analysis was used to provide the following college factor insights. Data are presented as mean ± standard deviation. Business students showed significantly higher PDE 3 scores ($M = 3.47$, $SD = 3.91$) than Health and Human Services students ($M = .58$, $SD = .89$), a mean difference of 2.89, CI [1.62, 4.16], which was statistically significant ($p < .001$). Business students showed significantly higher PDE 3 scores ($M = 3.47$, $SD = 3.91$) than Humanities and the Arts students ($M = .70$, $SD = 1.58$), a mean difference of 2.77, CI [.86, 4.67], which was statistically significant ($p = .001$). Business students showed significantly higher PDE 3 scores ($M = 3.47$, $SD = 3.91$) than Social Sciences students ($M = 1.72$, $SD = 2.51$), a mean difference of 1.74, CI [.08, 3.41], which was statistically significant ($p = .03$).

Engineering students showed significantly higher PDE 3 scores ($M = 3.87$, $SD = 4.61$) than Education students ($M = .63$, $SD = 1.25$), a mean difference of 3.24, CI [.18, 6.30], which was statistically significant ($p = .04$). Engineering students showed significantly higher PDE 3 scores ($M = 3.87$, $SD = 4.61$) than Health and Human Services students ($M = .58$, $SD = .89$), a mean difference of 3.29, CI [1.75, 4.82], which was statistically significant ($p < .001$). Engineering students showed significantly higher PDE 3 scores ($M = 3.87$, $SD = 4.61$) than Humanities and the Arts students ($M = .70$, $SD = 1.58$), a mean difference of 3.17, CI [1.10, 5.23], which was statistically significant ($p < .001$). Engineering students showed significantly higher PDE 3 scores ($M = 3.87$, $SD =$

4.61) than Social Sciences students (*M* = 1.72, *SD* = 2.51), a mean difference of 2.15, CI [.28, 4.01], which was statistically significant (p = .01).

Science students showed significantly higher PDE 3 scores (*M* = 4.37, *SD* = 6.05) than Education students (*M* = .63, *SD* = 1.25), a mean difference of 3.74, CI [.32, 7.16], which was statistically significant (p = .03). Science students showed significantly higher PDE 3 scores (*M* = 4.37, *SD* = 6.05) than Health and Human Services students (*M* = .58, *SD* = .89), a mean difference of 3.78, CI [1.18, 6.39], which was statistically significant (p = .001). Science students showed significantly higher PDE 3 scores (*M* = 4.37, *SD* = 6.05) than Humanities and the Arts students (*M* = .70, *SD* = 1.58), a mean difference of 3.67, CI [.75, 6.58], which was statistically significant (p = .005).

Mean PDE score 6 was higher for health students, but small sample sizes hindered additional statistical analyses of these factors. For College of Humanities and the Arts students, mean PDE score 6 was lower compared to those for students in other colleges. Among College of Science students, mean PDE 6 was lower. For College of Social Sciences students, PDE score 6 was higher than those for students in other colleges. The College of Education sample size (n=4) was too small for to enable evaluation of the intervention's impact on PDE scores 4 to 6 for education students.

In summary, students in the Colleges of Business, Engineering, and Science were significantly more engaged in measured internship-searching that those in the Colleges of Education, Health and Human Services, Humanities and the Arts, and Social Sciences.

Demographics of groups with common environment actual control factors. Chi-square tests were computed to assess gender and ethnic composition in the colleges and

meta-majors. Males were represented at a significantly higher level than females in Computing and Information Technology X^2 (1, N = 345) = 15.24, p < .001 and Engineering meta-majors X^2 (1, N = 345) = 11.79, p < .001. Females were represented at a significantly higher level than males in the meta-majors and colleges of Business/Accounting and Finance X^2 (1, N = 345) = 5.49, p = .19, Health and Human Services X^2 (1, N = 345) = 16.04, p < .001, and Social Sciences X^2 (1, N = 345) = 5.03, p = .03.

Asian/Asian American students had significantly higher representation than other students in the Computing and Information Technology meta-major X^2 (1, N = 322) = 12.18, p < .001, while Latino(a) students had significantly lower representation than other students in this meta-major X^2 (1, N = 322) = 11.96, p < .001. The opposite pattern was found for Health and Human Services majors, which had significantly higher representation from Latino(a) students, X^2 (1, N = 322) = 459, p = .03, and significantly lower representation from Asian/Asian American students X^2 (1, N = 322) = 4.83, p = .03. The same pattern was found for Social Sciences majors, which had significantly higher representation from Latino(a) students , X^2 (1, N = 322) = 14.86, p < .001, and significantly lower representation from Asian/Asian American students X^2 (1, N = 322) = 12.04, p < .001. White students had significantly higher representation in Engineering meta-majors X^2 (1, N = 322) = 5.44, p = .02.

Summary of Findings

Although all participants were assumed to have the intention of securing an internship and received 12 weeks of IFC intervention coaching, PDE scores were disparate and

revealed that 30% of participants were highly engaged relative to the rest. PDE scores 1 to 4 measured engagement in promoted CSO-sponsored and other professional-development events and services that involved behaviors students could choose to enact. PDE scores 5 and 6 measured outcomes of investments in these events and services and represented behaviors that were not in participants' direct control. Across all experiment groups, only 40% of all participants engaged in career- and professional-development education (PDE score 1) and 70% of participants engaged in measured internship-searching activities (PDE score 3). Both PDE 1 and 3 scores could be accurately reported for all participants from the CSO's student data management system, SJSU Handshake.

In spite of highly variable PDE scores, the Internship Fitness Challenge (IFC) intervention had a weak positive, but not significant, effect on mean PDE 1 to 4 scores in the treatment group. Students who had accepted an internship offer had PDE score 4 means significantly higher than those who had not secured an internship. This result provide some weak evidence that status quo bias relating to student PDE exists and was influenced by the treatment intervention. Given the limited effect of the treatment intervention, the following analysis of alternative factors that may have affected perceived behavioral control and actual control over the intended PDE behaviors may provide further insight.

Across demographic background factors, key differences in PDE scores were revealed. Male students were significantly more engaged than female students in measured internship-searching. Asian/Asian American students were significantly more involved in measured internship searching than students in other ethnic groups. Latino(a)

students were significantly less involved relative to other ethnic groups in measured internship.

Comparing experiential background factors revealed significant differences in PDE across experiences. Second-generation students were significantly more engaged in measured internship-searching than first-generation students. Transfer students were significantly more involved in career- and professional-development education than first-time freshman students. Juniors were significantly more involved in career- and professional-development education and self-reported internship-searching than sophomores. Asian/Asian-American students were overrepresented among second-generation students and first-time freshman. Latino(a) students were overrepresented among first-generation students.

Perceived behavioral control appears to have had a large effect on student PDE. Students with positive pre-intervention perceived behavioral control scores had higher mean PDE scores 1 to 6, with PDE score 3 (measured internship-searching) emerging significantly higher relative to students with negative pre-intervention perceived behavioral control scores. Between the start and end of the IFC intervention, post-perceived behavioral control scores increased significantly compared to pre-intervention perceived behavioral control scores for all groups. However, there was not a significant difference between the post-intervention perceived behavioral control scores of the treatment and control groups. Participants experienced significant growth in perceived behavioral control during the IFC intervention.

Participants older than 25 reported pre-intervention perceived behavioral control scores that were significantly lower compared to those for participants 25 and younger, but this difference was not repeated in post-intervention perceived behavioral control scores. Participants group who were working in a role related to their career goals reported significantly higher pre-intervention perceived behavioral control scores than those without such experience. These previously noted outcomes are consistent with the idea that perceived behavioral control is a measure of self-efficacy, which can grow through engagement in the types of experiences and reflections encouraged during the IFC intervention.

The following paragraphs address the ways that differences in ability/capacity factors of actual control significantly affected PDE scores. Ability/capacity factors of actual control measured time and other resource limits as well as participant perceptions of the impacts of resource limits and overwhelm their actual control over their PDE.

Participants who were working 20 hours or less were significantly more engaged in measured internship-searching than those who were working more than 20 hours. Asian/Asian-American students were overrepresented among non-working students and, if employed, worked significantly fewer hours than other students. Latino(a) students were overrepresented among working students and, if employed, worked significantly more hours than other students.

Socio-economic status as measured by reason for working appeared to have weak effect on student PDE scores. Students working to earn nondiscretionary income were somewhat less engaged in career- and professional-development education and measured

internship-searching. Latino(a) students were overrepresented and Asian/Asian-American students were underrepresented in the group working to earn nondiscretionary income. Students working to generate discretionary income had significantly higher internship offer acceptances. Students working to gain work experience engaged in somewhat greater measured internship searching. Asian/Asian-American students were overrepresented among students working to earn discretionary income. Asian/American and White students were overrepresented among students working to gain work experience.

Comparing the college environmental factor of actual control revealed some expected and counterintuitive results on PDE 3 scores of measured internship searching. Students in the Colleges of Business, Engineering, and Science show significantly greater engagement in measured internship-searching than those in the Colleges of Education, Health and Human Services, Humanities and the Arts, and Social Sciences. Due to SJSU's location within the Silicon Valley, engineering, business, and science students often find the most employment opportunities available through CSO services and are rewarded more readily for their internship-search efforts. In contrast, humanities and social sciences students have chosen majors without a direct application to specific occupations. Therefore, they must invest relatively more co-curricular time than students in applied-degree programs to explore career options and select a starting point for their internship search. From a behavioral economics perspective, the present-moment costs associated with investment in career exploration plus internship-searching may not be counterbalanced sufficiently with certainty that internship offers will emerge.

An unexpected result of this study was that College of Health and Human Services students were significantly less engaged in measured internship-searching relative to students in other colleges. This college recently implemented a requirement that all graduates must complete an internship. The researcher anticipated that the environment in this college would facilitate participant actual control for PDE. One explanation for this result could be that these students invest more time in internship-searching in the spring, when the campus' health professions career fair occurs and more urgency exists to find a summer internship. A second explanation could be that some academic departments in this college offer placement support for internship-searching. A third explanation could be that the demographics of student in this college mirror those that were found to lower PDE scores in general. Future multivariate analyses may reveal the relationships between these and other independent variables in this study that may have led to differences in PDE scores.

Chapter Five: Conclusion

Overview

This chapter is comprised of six sections. First, a brief summary of the study is presented. Second, a summary of the findings is offered. Third, a discussion of the research findings as well as their connection to this study's goals. In the fourth and fifth sections, recommendations for future research and implications for practice are provided. The final section offers conclusions from the study.

Summary of the Study

The research in behavioral economics has grown understanding among behavior designers that even when a person intends to change behaviors, bounded rationality can impede their behavior change. Use of skewed probability assessments, heuristics (or rules of thumb), and cognitive biases regarding potential outcomes can affect real-time decision-making and cause people to behave in ways that are contrary to their goals. Such irrational decision-making is most common in situations involving complexity, uncertainty, risk, and time-delayed consequences (Thaler & Sunstein, 2008). A review of literature revealed four primary types of cognitive biases observed in students (Lavecchia, Liu, & Oreopoulos, 2015). Those biases include present bias, which causes students to focus on immediate demands; cognitive overload, which is caused by flooding students with information; negative identities that reinforce low performance; and status quo bias, which is decision-making that relies on and rarely strays from routines without significant incentives (Samuelson & Zeckhauser, 1988).

Though most students attend college to secure employment opportunity, most do not have sufficient professional development engagement (PDE), which involves activities that prepare students for the college-to-work transition. The college-to-work transition shares many elements of decision-making environments expected to foster inertia, including complexity, uncertainty, and time delay between action and consequence. The more choices individuals must make in a particular situation, as is the case in the career- and professional-development process, the greater the chance they will maintain the status quo (Oehlmann, Meyerhoff, Mariel, & Weller, 2017). Unlike the structured academic routines to which students are accustomed, searching for internships holds an uncertain pay off for what may seem like a distant future.

This experimental study explored the effects of a 12-week text-message nudge intervention on student PDE. One goal of this research was to assess whether status quo bias, the tendency to maintain current decisions and associated behaviors even when new information emerges and better options are available (Samuelson & Zeckhauser, 1988), exists as a barrier to student PDE. A second goal of this research was to measure the impact on PDE of a text-message nudge intervention intended to influence real-time decision-making and overcome status quo bias. Alternative explanations for post-intervention PDE levels, including the effects background factors, perceived behavioral control, and actual control factors as defined in the Theory of Reasoned Action, also were explored.

The theoretical and conceptual framework for this study was comprised of four elements. The first was the concept of professional development engagement (PDE),

which is a dimension of college student engagement that involves participation in activities that prepare students of the college-to-career transition (Blau & Snell, 2013). The second was the Theory of Reasoned Action, a model for explaining the antecedents of intended behaviors (Fishbein & Ajzen, 2010). The third concept employed was that of status quo bias, which is the tendency to maintain current decisions and associated behaviors even when new information emerges and better options are available (Samuelson & Zeckhauser, 1988). The final concepts employed were the emerging behavior-change insights from the discipline of behavior economics that are described in the MINDSPACE Framework and challenge the idea that people behave as rational agents when choosing between alternatives (Dolan, et al., 2012).

It was assumed that students who registered for the study had an intention to find an internship. According to the Theory of Reasoned Action described in the literature review and portrayed in Figure 1, such students already possessed background factors and beliefs that contributed to an attitude of value for internships and an intention to engage in certain activities that would help them obtain one.

Summary of Findings

The purpose of this study was to assess whether status quo bias exists as a barrier to PDE and can be influenced by text-message nudges. Participants who registered for this study were assumed to have the intention of securing an internship and received 12 weeks of text-message coaching. Yet, only 30% of participants were highly engaged in professional-development activities. Despite widely varying PDE scores, the Internship Fitness Challenge (IFC) intervention had a weak positive, but not significant, effect on all

mean PDE scores in the treatment group. This study provided some evidence that status quo bias relating to student PDE exists and was influenced by the treatment intervention. Analysis of alternative factors that may have affected perceived behavioral control and actual control over the intended PDE behaviors offered insight.

Significant differences in PDE scores were revealed across demographic background factors. Male students were significantly more engaged than female students in measured internship-searching. Asian/Asian American students were significantly more involved in measured internship searching than students in other ethnic groups, while Latino(a) students were significantly less involved relative to other ethnic groups in the same dimension. Comparing PDE across experiential background factors also revealed major differences. Students with greater family or personal experience in college and more urgency to find an internship due to their proximity to graduation had higher PDE scores.

Students who started the intervention confident in their ability to find an internship had greater PDE. In other words, a positive pre-intervention perceived behavioral control had a positive effect on student PDE. Furthermore, the IFC intervention had a positive effect on post-intervention perceived behavioral control for both the treatment and control groups. It appears that the intervention increased the confidence of students in both experiment groups that they could find an internship. These findings are consistent with the concept of perceived behavioral control or self-efficacy, which Bandura (1997) indicated can be built through personally experiencing and learning about others experiencing success in a particular endeavor.

Ability/capacity factors of actual control were examined for their impact on student PDE. Among the factors examined were student actual and perceived time and other resource limits on actual control over their PDE. Participants who were working 20 hours or less were more engaged in measured internship-searching than those who were working more than 20 hours. Students who did not need to work to cover living expenses had higher offer acceptances than those who had to work for nondiscretionary income and those who were working to build work experience. Among meta-majors, differences in PDE appeared to be attributable to employment market conditions associated with those majors rather than ability/capacity facilitators or barriers to PDE of the major.

Comparing the college environmental factor of actual control revealed distinct impacts on PDE scores. Students in colleges with greater environmental reinforcements for PDE behavior, including supportive college culture and strong employment market incentives, had higher PDE scores. Students in colleges with non-applied majors who must invest more time to explore career options and determine a starting point for internship-searching had lower PDE.

Discussion

Four primary dynamics appear to have influenced PDE scores. First, relative to the control intervention, the treatment intervention appeared to have a weak positive, but not significant, effect on PDE. Second, patterns of student PDE score differences appeared across groupings of student demographic and experiential background factors. Third, positive mean pre-intervention perceived behavioral control scores had a significant positive effect on internship-searching behaviors. Fourth, differences across groupings of

student ability/capacity and environment factors of actual control appear connected to the patterns of student PDE scores found in the background factors. A summary of the significant differences in PDE scores across independent variables is shown in Table 9. Each of these dynamics are analyzed further in the following paragraphs.

Table 9

Summary of Statistically Significant PDE Score Differences

	PDE Scores Relative to Comparison Groups					
	1	2	3	4	5	6
Independent variable	Education	Networking and mentoring	Measured internship-searching	Reported internship-searching	Offers Received	Offer Accepted
Impact of IFC intervention						
Treatment group	-	-	-	-	-	-
Students who accepted internship offer during IFC	-	-	-	Higher	-	-
Background factors: Demographic						
Males	-	-	Higher	-	-	-
Asian/Asian-Americans	-	-	Higher	-	-	-
Latino(a)s	-	-	Lower	-	-	-
Background factors: Experiential						
Second-generation students	-	-	Higher	-	-	-
Transfer students	Higher	-	-	-	-	-
Juniors	Higher	-	-	Higher	-	-
Perceived behavioral control						
Positive pre-intervention perceived behavioral control	-	-	Higher	-	-	-
Actual control factors: Ability/capacity						
Working 20 hours per week or less	-	-	Higher	-	-	-
Students working for discretionary income	-	-	-	-	-	Higher
Meta-major: Computing and Information Technology	-	-	Higher	-	-	-

(continued)

Independent variable	PDE Scores Relative to Comparison Groups					
	1	2	3	4	5	6
	Education	Networking and mentoring	Measured internship-searching	Reported internship-searching	Offers Received	Offer Accepted
Meta-major: Engineering	-	-	Lower	-	-	-
Actual control factors: College environment						
Business	-	-	Higher	-	-	-
Engineer	-	-	Higher	-	-	-
Health and Human Services	-	-	Lower	-	-	-
Humanities and the Arts	-	-	Lower	-	-	-
Science	-	-	Higher	-	-	-
Social Sciences	-	-	Lower	-	-	-

The highly engaged groups of students were those with fewer ability/capacity barriers to engagement, comprising students with higher socioeconomic status who worked fewer or zero hours. These groups benefitted from supportive college and employment-market environment factors, including those within the Colleges of Business, Engineering, and Science. These groups were more Asian/Asian-American and male than the minimally engaged groups. Group experiences that facilitated PDE were being second-generation students, juniors, and transfer students. Additional multivariate analysis may reveal if these transferable experiences generated the positive pre-intervention perceived behavioral control scores found in students with significantly higher PDE scores. Finally, students who were closer to graduation and had a stronger temporal incentive to find an internship than sophomores had higher PDE scores. The higher PDE scores associated with temporal incentives provide evidence for status quo bias related to PDE.

For students in the highly engaged groups, it appears that some combination of reduced barriers, increased facilitators (including the treatment intervention), transferable

experiences, and timely incentives (including the treatment intervention) resulted in significantly higher PDE scores. For these group, it is possible that intervention plus their individual PDE facilitators were effective in reframing the probability of internship-search success and providing sufficient incentives for PDE relative to other present-moment concerns to overcome status quo bias. Also, the treatment intervention may have capitalized on lower cognitive overload in this group, an ability/capacity factor of actual control, of these students to nudge engagement further.

The minimally engaged groups included students with higher ability/capacity barriers to engagement, comprising students with lower socioeconomic status who worked more hours relative to other students. With the exception of students in the College of Health and Human Services, these groups included students whose majors were in non-applied degrees that require investment in career exploration and experience-building to translate to occupational settings. These groups was relatively more Latino(a), female, first-generation, and first-time freshman than the highly engaged groups. Additional multivariate analysis may reveal if these groups' relatively fewer transferable experiences generated negative pre-intervention perceived behavioral control scores found in students with significantly lower PDE scores. These groups also were more likely to be sophomores, which means that a key temporal incentive for PDE was weaker relative to that experienced by juniors.

For students in the minimally engaged groups, the combination of increased barriers, reduced facilitators, lack of transferable experiences, and lack of timely incentives resulted in significantly lower PDE scores. For these groups, the intervention combined

with their individual PDE facilitators did not sufficiently reframe the probability of internship-search success or provide enough incentives for PDE relative to other present-moment concerns to overcome status quo bias. In practice, the intervention may have had the effect of increasing cognitive overload and inertia in these students.

Each of these previously described dynamics offers evidence that status quo bias related to PDE is present. The treatment intervention leveraged several strategies from the MINDSPACE Framework detailed in Appendix B that were aimed at overcoming status quo bias. Primary strategies involved reframing engagement decisions to increase participant certainty of successful outcomes and create a sense of urgency to engage. These strategies had the effect of decreasing the perceived cost of engaging and increasing the perceived cost of not engaging. For the highly involved groups, the starting level of actual control was relatively high, which meant that cost of engaging was relatively low. For the minimally involved groups, the starting level of actual control was relatively low, which mean that the cost of engaging was relatively high. For this group, choosing to engage may have involved major tradeoffs, such as one between PDE and paying the month's rent or being able to get home in time to finish a critical assignment.

The Theory of Reasoned Action provided an effective framework for exploring other explanations for PDE scores beyond real-time decision-making environment. The intervention design, data collection, and analysis of findings were organized around the behavioral antecedents of this framework. The theory also provided a basis for the assumption that students who opted into the study possessed an intention for PDE. Key concepts in the framework align with behavioral economics explanations for behavior.

For example, the perceived behavioral control factor appears to include the behavioral economics concept of real-time outcome probability assessment. Actual control factors appear to include real-time decision-making bias processes, such as cognitive overload. Ultimately, the model facilitated meaningful exploration into the antecedents of PDE prior to the real-time decision to engage, including background factors, perceived behavioral control, and actual control.

The findings suggest that students with positive pre-intervention perceived behavioral control scores may have been more involved in internship-seeking than students with negative scores because they had higher expectations of securing an internship. perceived behavioral control represents the same construct as Bandura's perceived self-efficacy (Fishbein & Ajzen, 2010), which is "people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1997, p. 42). In other words, perceived behavioral control is an individual's assessment that they will emerge successful in a situation.

Perceived behavioral control appears to drive, if not overlap to some extent, the type of probability assessment of successful outcome that is involved in real-time decision-making and is targeted for nudging by behavioral economics researchers. The significant increase in perceived behavioral control scores over the course of the intervention suggests that even if some students were unable to implement intended PDE behaviors due to certain barriers in their lives, the intervention may still have had the effect of increasing their probability assessment of future success relating to PDE. Extending the

period of behavior measurement into the spring semester may have provided more evidence for this idea.

One goal for this study's intervention was to design a low-cost, scalable solution to increase student PDE. To that end, text messaging was chosen as the delivery method because the cost to set up and maintain text communications was less than $600 for a five-month period of usage. This technology enabled the researcher to preschedule delivery of all the intervention messages as well as spontaneously communicate with the entire group when desired. Furthermore, ninety-two percent of participants remained engaged in the study after registration and received the full schedule of messages during the 12-week intervention.

One challenge encountered in this study was that PDE appeared to taper off as the intervention continued beyond the fall semester peak of the career-education and recruiting season. It is possible the researcher could have increased the intensity of support, had the same or greater impact on student PDE, and formed the same insights with a six-week intervention. Furthermore, while starting an internship search in fall increases the chances of securing one before summer, running a similar intervention only in spring semester might have resulted in higher PDE due to the increased temporal incentive offered by the shorter lead time before summer. Alternatively, delivering the bulk of the intervention in fall, continuing periodic nudges in spring, and collecting engagement data into the spring semester may have revealed a sustained boost in PDE due to increased post-intervention perceived behavioral control.

It is possible that the limited interactivity of the text-message service used in this intervention created a barrier to keeping students engaged throughout the 12-week period. Though students were provided several electronic methods to communicate with the researcher, have their questions answered, and build a sense of personalized experience, very few replied to the messages they received. Modification to this intervention could be the incorporation of more media and encouragement for interactivity into the text messages. Some text messaging platforms enable sharing of images, videos, and other forms of interactions between the researcher and participant. These elements could increase the sense of personalization and familiarity, both of which are behavioral economics techniques that could further positively frame the choice to engage.

Recommendations for Future Research

Research is limited on PDE, on behavioral economics applied to higher education, and on the Theory of Reasoned Action applied to education. In the following paragraphs, the researcher will offer several suggestions for additional research.

Many opportunities exist to adjust how this study was designed and further explore barriers to student PDE. A future study could be focused on one college with typically low PDE. This approach could aid the use of mixed methods and deeper analysis into student PDE facilitators and barriers. For such a study, a tailored intervention could be designed that could increase the real-time incentives for PDE. The intervention could be differentiated for sophomores and juniors. The intervention timing could be aligned with an internship-searching period that is most convenient for students in the selected college. Alternately, incorporating a third experiment group that received only monthly emails

could have explored how treatments with greater contrasts in content could have produced more distinct effects on PDE.

PDE is a newly defined dimension of student engagement. Future research could explore ways to enhance this concept with theories of human- and career-development. Though it was valuable to the framing of this study, the current PDE concept is structured like a checklist of professional-readiness tasks, rather than a rounded professional-development learning framework for students. For this study, the researcher organized the SJSU-specific PDE items based on unique campus CSO operations. However, the incorporation a learning progress map, such as that implied in the Job Search Self-Efficacy Scale, could add human-development depth to the concept of PDE.

Adding qualitative research into a similar study could develop deeper insights into the antecedents to intended behavior as well as participant reactions to the intervention design. The Theory of Reasoned Action informed this study's research design to understand how background factors, perceived behavioral control, and actual control affected PDE. Yet, questions remain on how the other elements of this theory, including beliefs, attitudes, and norms may have affected student engagement in this study. Given the great diversity of participant background factors in this study, it's possible that differences in these dimensions also contributed to varying PDE scores. To design culturally relevant PDE opportunities that resonate with diverse student demographics, such insight is essential.

Though it was not originally specified a background factor in this study, student residency status may have influenced participant internship-search engagement in this

study in two ways. First, international students who hope to stay in the U.S. may feel compelled to secure internships that could lead to full-time employment after graduation. Therefore, international students may have a much stronger incentive for PDE inputs than domestic students. Second, some employers may be reluctant to hire interns that require sponsorship to convert to a full-time employee in the future. As a result, international student internship-search outputs may have been negatively affected. Additional research that distinguishes between international and domestic students will enable deeper exploration of these dynamics.

Another opportunity for additional research could be building greater evidence around the ways that behavioral economics insights fit with the extensively researched Theory of Reasoned Action. It appears that there may be several overlapping constructs between the theory and behavioral economics, such as perceived behavioral control and success probability assessments, actual control and real-time decision-making. For this study, the Theory of Reasoned Action enabled the researcher to narrow down a large list of potential cognitive biases relating to PDE and select one (status quo bias) to fit with this particular study. Other behavior change practitioners could benefit from research insights on how to use the Theory of Reasoned Action to diagnose and influence the cognitive biases impeding intended behavior.

Implications for Practice

After observing from SJSU CSO data that the same small percentage of students engage in the bulk of career services, the researcher began this study striving to learn about the imbalance between students' intentions to build careers compared to their level

of engagement with CSO services included in their tuition. The college-to-work transition can be described as complex, uncertain, and full of time delays between behaviors and associated outcomes. While CSOs must be accountable for delivering quality programs, these college-to-work transition factors are likely to cause status quo bias toward PDE that cannot be solved solely by designing more effective PDE opportunities and promoting them broadly. In this study, participants possessed intention for PDE, which was evidenced by their choice to register for the study. They received frequent and multimodal opportunities for PDE and a 12-week coaching program designed to overcome status quo bias. Yet, over 30% of participants engaged in no measured internship-searching and the levels of engagement were either very low or zero for 70% of participants.

Despite initial evidence from this study that status quo bias is a factor in PDE, it appears that for most participants, the barriers to intended engagement were too large to overcome with simple coaching, decision reframing, and incentives. The disparity in participants' prior professional-development experiences and perceived behavioral control (self-efficacy) appeared to be key factors in the choice to engage. Furthermore, the level of actual control barriers and facilitators to PDE were highly unique to the student sub-populations at SJSU. The challenge for CSO and other higher education leaders is to design solutions that acknowledge the combination of these factors on their campuses. In the following paragraphs, the researcher will offer suggestions for future career services design with a focus on resolving barriers to PDE and increasing student confidence in successful future outcomes associated with PDE.

First, the Theory of Reasoned Action can be used to define segments of students with common backgrounds, PDE experiences, attitudes toward PDE, and actual control over PDE. Most public university CSOs lack capacity to custom design solutions for every department or course, but designing solutions for broad segments of students with common needs may effectively address the majority of needs and increase the sense of familiarity students feel with services. This process of student-need segmentation may illuminate universal barriers to PDE that drive solution design choices, such as the need for highly convenient ways to draft a résumé for students who work more than 20 hours per week and have greater than average commutes. Another example could be embedding early professional-development experiences in first-generation student journeys to generate perceived behavioral control. By the time these students reach junior year, they would have built a positive assessment of the likely outcomes associated with PDE and be more inclined toward continued PDE.

Second, effort must be invested to build positive beliefs and culture toward PDE. The Theory of Reasoned Action identifies three types of beliefs relating to a behavior: behavioral beliefs that drive outcome valuations, normative beliefs that influence the level of compliance with norms, and control beliefs that affect sense of control. An effort to modify beliefs might begin with qualitative research to understand the current beliefs of students, faculty, and staff toward PDE. The insights generated from this research could guide efforts to change beliefs and attitudes toward PDE with targeted behavioral economics strategies, such as those outlined in the MINDSPACE Framework in Appendix B. For example, numerous decision-making heuristics are influenced by

sharing success stories and testimonials relating to particular behaviors. These strategies have the effect of reframing choices and changing the assessment of probable success.

Third, positive beliefs must be converted to positive attitudes driven by observable institutional practices that reinforce PDE. The attitude elements of the Theory of Reasoned Action include the following factors: attitude toward behaviors based on expected and actual outcomes, perceived norms of the ideal and observed behaviors, and perceived behavioral control or self-efficacy relating to a behavior. To foster positive attitudes toward PDE, practices must be made a regular part of the student journey to graduation. Behavioral economics offers some guidance on how best to design this journey. The most effective way to resolve status quo bias is by implementing default choices (Suri, Sheppes, Schwartz, & Gross, 2013), which could involve requiring a minimum set of PDE experiences to graduate. For example, requiring all freshman to complete a basic résumé by the end of the first semester would be a small step to spur greater intention and action toward PDE. To avoid causing cognitive overload, PDE opportunities should be clear, easy to locate, and not excessive or competing. In other words, there is a critical role for effective pedagogy in curating and prioritizing curricular and co-curricular learning pathways for student PDE.

On some campuses, minimum PDE experiences have been defined for each year and aligned with a campus-wide developmental progress map ending in the college-to-career transition. The ideal intervention designed to influence status quo bias against PDE would create an environment in which students are required to take small PDE actions from which greater value is derived than would be from inaction. To address differences

in attitudes toward PDE and inequality across actual control factors for PDE, ideally these minimum PDE experiences would be embedded in coursework. For example, modular, off-the-shelf resources could be provided to general education instructors that enable them to assign learning and engagement requirements for PDE that are designed and conducted by the CSO. Given their effect on PDE behaviors, experiences that generate perceived behavioral control relating to PDE should be prioritized not just as mandatory experiences but also as institutional support priorities.

Assuming institutionalized and default PDE experiences have been designed to resolve the most common actual control barriers to PDE, the fourth step in the design process would be to create differentiated solutions for groups of unique actual control barriers to PDE. From the Theory of Reasoned Action, actual control barriers could arise from skill gaps, ability/capacity gaps, and/or environmental obstacles. Although the CSO lacks capacity to develop personalized solutions for every student, they can identify scalable ways to personalize services for students. For example, if a barrier to PDE is the lack of understanding of how to build a career in a niche occupation, the CSO could collaborate with campus stakeholders to build an alumni professional mentoring network that can scale personalized professional-development guidance. From the MINDSPACE Framework in Appendix B, this approach is likely to influence several decision-making heuristics to increase the sense of PDE availability and familiarity. A second example could be developing a paid internship-preparation program for underrepresented students, perhaps sponsored by several employer partners who would welcome program graduates to compete for internship opportunities. A final example of this approach could involve a

the development of a matrix organization for career services in which CSO staff members have dotted line reporting relationships to colleges and student success centers to facilitate deeper understanding of unique population professional development needs. Such a program would offer an incentive to complete the program that could change the balance of PDE-investment costs relative to the status quo.

In summary, designing career services based on the Theory of Reasoned Action and behavioral economics could produce beneficial differentiation for the highly engaged and minimally engaged student. For the highly engaged student, this study showed that designing career services that are informed by behavioral economics is likely to spur even more PDE. For the large majority of students on public university campuses like SJSU who struggle to overcome both status quo bias and actual control barriers to PDE, more deliberate integration of minimum default PDE experiences within the classroom and institution could help resolve the issue of unequal access to PDE.

Conclusions

Thus far, no research has been completed on PDE to explore the impact of cognitive bias on real-time decision-making to engage in professional development. This study explored that possibility through a 12-week, text-messaging intervention experiment. The reasons students don't engage in professional development to a level that equals their intention to build career opportunity from their degree are complex and may be counterintuitive. This study evaluated several possible explanations, including background factors, attitudes, actual control, and status quo bias. By comparing the intervention results across experiment groups, background factors, and behavioral

antecedents as defined in the Theory of Reasoned Action, the researcher was able to evaluate the impact of the treatment intervention on student PDE. As a result of this study, evidence was generated for four conclusions regarding the effect of status quo bias, background factors, attitudes, and actual control on student PDE.

First, this study provided initial evidence that status quo bias creates a barrier to student PDE. Similar to the findings in Martinez-Aleman and Wartman (2009), the text-message intervention in this study had a weak positive effect on changing student choice for PDE. Despite the limited effect of the treatment, several other results of this study provided evidence of status quo bias.

Second, PDE scores varied significantly across select demographic and experiential background factors. Unlike the results in Castleman and Page (2016), it appeared that participants in this study who had higher socio-economic status and experiences related to PDE benefitted the most from the intervention. Perhaps these background factors, when combined with the intervention, generated positive expectations of success related to investments in PDE and helped these students overcome inertia. Alternatively, in the Castleman and Page (2016) study, the text-messages contained personalized content that may have produced stronger effects across the range of student demographics.

Third, select PDE scores varied significantly by participant attitudes toward PDE and perceived behavioral control, specifically. Similar to the findings in Pugatch and Wilson (2018) that any type of treatment increased engagement, both the treatment and control group interventions generated increases in perceived behavioral control. The differing content of the text-message nudges did not produce unique effects on perceived

behavioral control. Fourth, students who had prior PDE experience appeared to have higher perceived behavioral control that may lead to greater PDE.

Fifth, PDE scores varied significantly across select ability/capacity and environment factors of actual control. It appears that for many participants in this study, the barriers they encountered to PDE prior to the real-time decision for PDE ultimately played a larger role in their PDE scores than did intervention's power to overcome status quo bias. In contrast to the findings in Castleman and Page (2014), students with the most actual control facilitators to PDE, such as limited work hours and supportive college and employment market, appeared to benefit most from the IFC intervention.

PDE is essential for student employability, employment success, and economic self-sufficiency. Though student engagement with CSOs can help to resolve many of the previously described barriers to PDE, campus CSOs often are underutilized, understaffed, and undervalued (Fouad, et al., 2006). At a time when early-career employment sources and arrangements are increasingly complex, the median number of campus career services staff members has remain unchanged since 2013 at four (National Association of Colleges and Employers, 2018). Unsurprisingly, student perceptions of career services value have declined over time (Gallup, 2016). Nearly a third of students never visit their CSOs throughout their college experience (Gallup, 2016).

Universities may have underinvested in or resisted academic integration of professional development to avoid diluting their mission to develop learners rather than workers. At the same time, universities promote graduate employment outcomes as a means to recruit students. Future occupational disruption from artificial intelligence and

automation may increase university incentives to invest in student professional development. Rapid career evolution is predicted to increase student professional-development needs and preference for episodic, lifelong learning rather than extended degree programs (McKinsey Global Institute, 2017; Georgia Instititute of Technology Commission on Creating the Next in Education, 2018). Helping students define and resolve their professional-development needs may become the starting point for recruiting future students as well as an existential matter for degree programs and colleges that face declining enrollment. Finally, the connectedness of occupational wellness with student success, social wellness, and emotional wellness (Multon, Heppner, Gysbers, Zook, & Ellis-Kalton, 2001) underscores that professional development should not be considered peripheral to a holistic student-development strategy.

This study has provided some evidence that the complex, uncertain, and future-focused nature of professional development can lead many students to avoid engagement completely. Recognizing this dynamic of avoidance, structuring career services as a purely co-curricular option and relying on the CSO to generate their own engagement through promotion will fail for all students except those who are least burdened by time and resource barriers, most pressured by impending graduation, and most confident they will succeed because they have a base of experiences on which to draw. In other words, this approach to student PDE will fail for every student who needs PDE support most.

Some campuses have re-evaluated the organizational alignment of their CSOs to create an agile, integrated academic and career success strategy, as evidenced by the growing trend to align career services with academic advising and alumni relations rather

than as-needed student services, such as counseling and psychological services (National Association of Colleges and Employers, 2017). Perhaps the best way to maximize PDE is to position the CSO as a professional development infrastructure hub, similar to a campus library that serves as a research hub, rather than the direct provider of all professional development. In this role, the CSO develops campus-wide standards and modular resources that can be integrated into curricular and co-curricular settings. Ultimately, restructuring student PDE to embed at least some universal career and experiential education in student academic programs is a social justice issue. On campuses like SJSU, the majority of students will not find the capacity, confidence, and well of experience to support them in making a successful college-to-work transition without such intentional integration.

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Appendices

Appendix A: PDE Item and Corresponding SJSU PDE Activity

PDE item number	PDE item	Corresponding SJSU PDE item during fall 2018 semester
Career- and Professional-Development Education		
1	Co-curricular workshops (business etiquette, job search strategies, etc.)	Number of career and professional development workshops attended
		Number of career advising sessions attended for all topics except résumé writing and interviewing
9	CPDC Blackboard resources (e.g., Hoover's list, First Research)	Number of self-assessment and career exploration modules completed in Focus2
2	Multiple résumé critiques, including employer résumé critiques	Number of career advising sessions attended for résumé writing
8	Employer industry (mock) interviews	Number of industry mock interview events attended
		Number of career advising sessions attended for interviewing
		Account created in Big Interview, the online mock interview tool
Networking and Mentoring		
6	Senior reception	Number of non-SPO networking events attended
5	Professional development activities through student professional organizations (SPO)	Pre-intervention membership in SPO
		Post-intervention new membership in SPO
10	How many SPO meetings do you attend on average during a semester?	Number of SPO meetings attended

(continued)

PDE item number	PDE item	Corresponding SJSU PDE item during fall 2018 semester
Internship-searching		
3	CPDC intranet for job/internship applications	Number of résumé s uploaded in SJSU Handshake
		Profile updated in SJSU Handshake
		Number of reported internship applications submitted
		Number of applications submitted in SJSU Handshake
7	Spring connection	Number of job/internship fairs attended
		Number of employer information sessions attended
4	On-campus recruiting	Number of internship interviews completed
11	How many formal internships or co-ops did you participate in while a student at this university?	Number of internships or co-ops completed while at SJSU
		Internship offer accepted (yes or no)

Note. Adapted from "Toward Understanding Business Student Professional Development" by G. Blau, M. Blessley, M. Kunkle, M. Schirmer, and L. Regan, *Journal of Education for Business*, *92*(3), 145-152.

Appendix B: Behavioral Economics Techniques to Influence Status Quo Bias in the MINDSPACE Framework

MINDSPACE cue	Decision frames or heuristics affected	Technique	Example in IFC Intervention
Messenger	Leverage the authority and trustworthiness of key individuals		
	Availability heuristic: The tendency of people to assign the highest value and/or probability to the options they first recall	Use testimonials of trusted individuals to build credibility Give examples of positive outcomes Compare an organization's services and resources to a familiar service and resource Make it clear how services and resources should be used Highlight vivid negative outcomes due to inaction	IFC Events and Resources Guide in Appendix F
	Familiarity heuristic: The tendency to think that outcomes from past decisions will remain consistent for the same decisions in the future	Align services and resources to typical behavior patterns of clients Create a consistent service experience to reduce variability	Appendix I, 10/17/18 message
Incentives	Change pricing and probability assessments		
	Reference points: The starting point of a decision from which losses or gains are evaluated	Determine current reference point relative to desired behavior change to identify appropriate incentives Encourage the creation of a distinct resource allocation (resources, time) for desired behavior	Appendix I: 10/24/18 message

(continued)

MINDSPACE cue	Decision frames or heuristics affected	Technique	Example in IFC Intervention
	Loss aversion: When faced with a risky choice, potential losses are weighted more heavily than potential gains *Endowment effect:* The phenomenon in which people value what they have more than equally valued alternatives *Scarcity effect:* The tendency to think that something that has limited quantity has higher value	Communicate deadlines and/or limited supply to encourage action Predict or enact losses associated with inaction	Appendix I, 9/16/18 message
	Certainty effect: The tendency to pursue options that produce a certain gain	Emphasize secure gains via peer stories of engagement benefits Make engagement highly convenient and available when needed	Appendix I, 10/3/18 message
Norms	Increase reference to what others are doing and the desire to conform		Appendix I, 10/7/18 message
		Imply that most individuals participate in the target behavior Relate the target behavior to the typical behavior of target individuals Provide vivid social comparisons	
Defaults	Eliminate the choice of no action		
	Status quo bias: When people maintain current decisions and associated behaviors even when new information emerges and better options are available	Implement default choices that require action to either engage or opt out Require active choosing from limited options rather than no choice Progressively increase the level of engagement requiring a small first action to break inertia	None in this study

(continued)

MINDSPACE cue	Decision frames or heuristics affected	Technique	Example in IFC Intervention
Salience	Draw attention to meaningful information		
	Engage head and heart	Capture attention through novelty, visibility, cultural relevance, and personalization	Fitness theme of IFC intervention
	Empower decision making	Help filter excess information Map choices and time requirements Give personal feedback on progress Anticipate decision making errors	Appendix F, IFC Events and Resources Guide
	Create a behavioral anchor for comparison	Provide information on how specific behaviors lead to specific outcomes	Appendix I, 11/7/18 message
Priming	Connect sights, sounds, and sensations to specific behaviors to elicit an automatic response		
		Ask about intentions to increase likelihood of action toward intentions Associate behavior with a recognizable symbol	Appendix I, 10/14/18 message
Affect	Identify emotions that cause automatic responses		
	Emotional heuristic: The tendency of people to connect the emotion they feel at the time of choosing an option to that option	Match the mood needed to engage Avoid the feeling of ambivalence associated with behavior Ensure that engagement produces positive emotions	Appendix I, 10/31/18 message

(continued)

MINDSPACE cue	Decision frames or heuristics affected	Technique	Example in IFC Intervention
Commitments	Build commitment to intentions		
	Commitment heuristic: The tendency to stick with a decision after investing time in it	Create habits and default processes that reinforce commitments	Appendix F, Welcome email
		Reinforce commitments through written intentions	
		Create symbolic commitments to smaller steps toward the larger behavior	
		Provide small incentives to create a sense of indebtedness to complete behavior	
	Disposition effect: The tendency to stick to a commitment even when losses or opportunity costs are incurred	Avoid disengagement after losses with special incentives	Appendix I, 11/4/18 message
		Package deals that emphasize convenience and value	
		Stop support of older services	
Ego	Encourage positive self-image		
		Attribute successes to client effort and talent	Appendix I, 11/21/18 message
		Connect positive self-image with behavior	
		Associate small steps towards target behavior with target outcome	
		Focus on change actions first; attitudes will follow	

Note. Adapted from several sources, including "Social influence: Compliance and conformity," by R.B. Cialdini and N.J. Goldstein, 2004, *Annual Review of Psychology*, *55*, 591-621.; "Influencing behaviour: The mindspace way," by P. Dolan, M. Hallsworth, D. Halpern, D. King, R. Metcalfe, and I. Vlaev, 2012, *Journal of Economic Psychology*, *33*(2012), 264-277.; *Nudge: Improving Decisions About Health, Wealth, and Happiness* by R. H. Thaler and C.R.Sunstein, 2008, London: Penguin Books Ltd.; "*Design for the Mind: Seven Psychological Principles of Persuasive Design" by* V. S. Yocco, 2016, Shelter Island, NY: Manning Publications, Co.

Appendix C: Recruiting Flyer

8,000 INTERNSHIPS were listed in SJSU Handshake last year.

JOIN the
INTERNSHIP FITNESS CHALLENGE (IFC),
an internship readiness program
and pilot study to start
your internship search.

DIGITAL COACHING
to gain 6 internship prep skills
in 12 weeks

The IFC is a pilot study run by the SJSU career center director and doctoral candidate, Catherine Voss Plaxton.

TO PARTICIPATE
you must be a sophomore or junior with a cell phone that can receive text messages.

QUESTIONS?
catherine.vossplaxton@sjsu.edu

REGISTER by 8/31/18
in SJSU Handshake events
at sjsu.joinhandshake.com.

Recruiting for summer interns starts now!

Appendix D: Invitation Email and Event Listing

Invitation sent from and posted as an event in SJSU Handshake

SUBJECT: Internship Fitness Challenge Pilot Study

Hello [Student Name],

Considering looking for an internship? Last year, employers posted over **8,000 internships in SJSU Handshake**, the campus' career management system. Because SJSU's top employers start recruiting summer interns now, fall semester is a great time for sophomores and juniors to start searching for an internship and learning about career opportunities.

To help you start an internship search, I invite you to join the 12-week Internship Fitness Challenge (IFC). The IFC is an internship readiness program and pilot study that will coach you through the process of finding a summer internship with on-campus and online resources available to SJSU students.

How it Works

After you **register by August 31**, you will receive an IFC welcome email on September 1. Starting September 2, you will receive two or three text messages each week with guidance on how to achieve the IFC's goals. Though I can't promise an employer will offer you an internship during this challenge, I can promise that if you accept the IFC you will gain critical skills and confidence for internship searching.

6 Goals of the Internship Fitness Challenge

1. Find several **sources of internships**.
2. Prepare a **résumé** to increase your chances of being interviewed.
3. Organize and activate your **internship search**.
4. Prepare a **conversation starter** to attract the interest of employers.
5. Interact productively with employers at a **job/internship fair**.
6. Prepare to impress employers during **interviews**.

The Time Commitment

The IFC weekly goals require one to two hours of your time for optional professional development activities each week. All IFC activities will take place at SJSU or online. At the beginning and end of the IFC, you will be asked to complete a 5-minute survey for the pilot study.

The Incentives

In addition to the big benefit of growing your ability to find an internship, you will be eligible to receive a snazzy sneaker key chain that will be awarded to all students who receive text messages throughout the program and complete the pre- and post-program surveys.

The Facilitator

I am the director of the SJSU Career Center and a doctoral student at SJSU. I have held six internships that were critical steps in my own career growth. The IFC is a service I am glad to offer to SJSU students and a pilot study I will complete for my degree.

To Register for the IFC

Please **register** for the IFC and complete the brief (3-minute) registration and study consent form. Be prepared to provide your cell phone number to receive text messages from me. Please direct questions regarding the IFC to me at the contact information provided below my signature.

Did you know: getting a paid internship nearly doubles your chances of having a job offer within six months after graduation (Center on Education and the Workforce, 2015)? ***Let's get moving to find yours!***

Sincerely,

Catherine Voss Plaxton
Director, SJSU Career Center
catherine.vossplaxton@sjsu.edu
(408) 924-6051

Appendix E: Informed Consent Notice and Registration Form

REQUEST FOR YOUR CONSENT TO PARTICIPATE IN A PILOT STUDY

Title of the Study

A Text-Message Nudge Intervention to Increase Student Professional Development Engagement

Researcher Name(s)

- Researcher: Catherine Voss Plaxton, Director of the career center and student in the Doctorate in Educational Leadership Program at San José State University
- Committee Chairperson: Elaine Y. Chin, Ph.D.

Study Purpose

This pilot study will explore the impact of a 12-week internship-preparation text-message coaching program on student engagement in professional development activities that can help students secure internships, such as résumé workshops. The support program is called the Internship Fitness Challenge (IFC) and is organized to guide students to complete six internship-preparation goals in the 12-week period.

Study Procedures

Students will be invited to join the study on August 19, 2018 and complete this consent form by August 30, 2018. During this period, students will be asked to provide their names and cell phone numbers to the researcher to facilitate program communication via text messaging. Throughout this registration and consent period, participant cell phone numbers will be entered into the text-message application TXT180 that will allow the researcher to send text messages to participants.

On September 1, 2018, registered participants will be organized into treatment and control groups to allow comparison of the effects of different forms of text messages. Starting September 2, 2018, participants will receive up to three text messages each week from the researcher during the 12-week program. At two points during the program, participants will be asked to respond to brief, optional, text-message surveys.

The IFC text messages are designed to encourage student engagement in professional development activities offered by the career center, but all activities promoted in the program are optional and regularly available as part of campus career services to participants. All promoted professional development activities will occur on the San José State University campus.

To evaluate IFC Program impact on professional development engagement, data will be collected on each participant in addition to the name and cell phone numbers collected in the registration process.

Demographic data, including student identification number, gender, ethnicity, first year on campus, age, year in college, and enrollment status will be gathered from Peoplesoft, the campus' student data system. Participant responses to the study's pre- and post-program survey will be collected using Qualtrics survey tool.

Email addresses and data on participant engagement in professional development activities will be captured from the SJSU career services database, SJSU Handshake, and digital career learning systems including Focus2, VMock, and Big Interview. Activities that will be tracked include:

- Use of online and live career education and advising,
- Attendance at networking events,
- Completion of internship-search activities, such as résumé uploads, profile development, and internship applications, and
- Attendance at recruiting events.

Potential Risks

This study's program promotes career services and events that are available to any SJSU sophomore or junior. The risks associated with this study are minimal, however, all engagement in professional development activities involves some level of risk. It is possible that during this study a participant could experience psychological distress from being encouraged to engage in professional development while managing other life commitments. The researcher is prepared to refer participants to additional support services should a participant's distress reach a level that causes them discomfort or impedes their ability to function.

Another risk associated with participation in this study is the possibility that a student's contact information, demographic data, and professional development engagement data are inadvertently revealed during the study. Measures the researcher will take to manage this risk are described in the *confidentiality* section.

Potential Benefits

One benefit of participating in this study can be derived from actively engaging in the program to prepare for internship searching. Participants will have the opportunity to learn the range of basic skills to find an internship. A second benefit to participating in this study is participants will contribute to the understanding of how campuses can engage students through scalable, low-cost communication strategies. Applying such methods at a large campus could lead to greater operational efficiency and availability of resources for students.

Compensation

Participants will be eligible to receive a sneaker key chain that will be awarded all students who receive text messages throughout the program and complete the pre- and post-program surveys.

Confidentiality

During the data collection period, all study data will be kept in an Excel data preparation spreadsheet to enable merging of data from multiple sources. The researcher commits to secure all participant data on hardware and software systems protected with passwords and encryption to avoid data security risks. Faculty advisors associated with this study may view the data in the process of advising the researcher. Only aggregated and anonymous data will be shared with others for reporting purposed; no individually identifiable data will be shared.

At the end of the data collection period and no later than March 31, 2019, the merged data records will be made anonymous by generating random study identifiers and deleting data that could be connected to specific individuals. All data analysis in SPSS will be completed with this anonymous data. At the end of the study and no later than March 31, 2019, participant cell phone numbers will be removed from the TXT180℠ text messaging application.

Participant Rights

Your participation in this study is completely voluntary. You can refuse to participate in the entire study or any part of the study without any negative effect on your relations with San José State University or the campus' career center. You also have the right to skip any question you do not wish to answer. This consent form is not a contract. It is a written explanation of what will happen during the study if you decide to participate. You will not waive any rights if you choose not to participate, and there is no penalty for stopping your participation in the study.

To participate in the Internship Fitness Challenge, you must possess a cell phone and be willing to provide your cell phone number. Your cell phone number will be used only for the purpose of receiving and responding to text messages that are part of the Internship Fitness Challenge. Your cell phone number will be used only by the researcher and will be removed from both the messaging application and the research database at the end of the study.

Contacts for Questions or Problems

You are encouraged to ask questions at any time during this study.

- For further information about the study, contact Catherine Voss Plaxton, catherine.vossplaxton@sjsu.edu, (408) 924-6051
- Complaints about the research may be presented to Elaine Chin, Ph.D., elaine.y.chin@sjsu.edu
- For questions about participants' rights or if you feel you have been harmed in any way by your participation in this study, please contact Dr. Pamela Stacks, Associate Vice President of the Office of Research, San José State University, at 408-924-2479.

Participant Consent Confirmation and Cell Phone Number

By typing your name, date, and cell phone in this form, you indicate that you voluntarily agree to be a part of the study, that the details of the study have been explained to you, that you have been given time to read this document, that you have a contact to which your questions can be referred, and you have no specific questions remaining that would prevent you from electronically signing this form.

Participant's Name: [Qualtrics Field] Date: [Qualtrics Field]

Participate Cell Phone Number: [Qualtrics Field]

Participant Signature: [Qualtrics Field]

Appendix F: Welcome Email

Welcome email sent from SJSU Handshake

Welcome to the Internship Fitness Challenge!

By joining the Internship Fitness Challenge (IFC), you will jump start your search for a summer internship. You have made a great choice: starting fall semester will give two semesters to find a summer internship.

To start the IFC, please complete this brief survey to help me get to know you.

Through two or three weekly texts that will start tomorrow, the Internship Fitness Challenge will help you stay focused on completing the IFC's weekly goals. The weekly goals and the roadmap to achieving them are shown on the following handout.

Mark event dates and times on your calendar now. If you can't join the events promoted in the IFC, you can find more programs and events from two spots:

- ***Log into SJSU Handshake*** (the student career management system) with your SJSUOneID to search for internships, find event details, and schedule career advising appointments. Log in with your SJSUOne ID.
- ***Visit the career center website*** to find the full program calendar and tons of online resources to help you with internship searching from anywhere at any time.

Once again, welcome to the IFC. You have made a great choice to start building your future now. Please contact me if you have questions on the IFC process or if you don't get a text message from me tomorrow.

Sincerely,

Catherine Voss Plaxton
Director, SJSU Career Center
Doctoral Candidate, SJSU Ed.D. Program
catherine.vossplaxton@sjsu.edu
(408) 924-6051

Internship Fitness Challenge Event and Resource Guide

Use this guide to plan your path to internship fitness. Learn more about events and resources in SJSU Handshake and at www.sjsu.edu/careercenter.

IFC Goals	Key Events	On-demand Resources
Find several sources of internships.	Networking & Informational Interviews, ADM 255 M 9/10 12pm-1pm Th 10/18 3:30pm-4:30pm Th 11/8 12pm-1pm	Build experience web page Launch web page Job & Internship Search Guide
Prepare a résumé to increase your chances of being interviewed.	Résumé Studio, ADM 255 W 9/12 12pm-1pm TU 10/9 3:30pm-4:30pm M 10/22 12pm-1pm W 11/14 12pm-1pm	Résumé Guide VMock (online résumé feedback) – coming soon!
Organize and activate your internship search.	Job & Internship Search , ADM 255 W 10/17 12pm-1pm M 10/29 3:30pm-4:30pm M 11/26 12pm-1pm	Upload your résumé in SJSU Handshake and apply to internships there. Job & Internship Search Guide
Prepare a conversation starter to attract the interest of employers.	Job/Internship Fair Success, SU Room 2 & 3 W 9/5 12pm-1:15 pm TU 9/11 12pm-1:15 pm M 9/17 4pm-5:15pm	Job & Internship Search Guide
Interact productively with employers at a job/internship fair.	**Job & Internship Fairs in SU Ballroom** Part-time/On-Campus Job Fair F 927 11am-2pm Business/Government Job & Internship Fair Th 9/13 12:00pm-4:00pm STEM Job & Internship Fair Tu, W 9/18, 9/19 12:00pm-4:00pm Part-time/On-Campus Job Fair Th 11/1 11am-2pm	Research employers attending the fairs and their opportunities in SJSU Handshake. Find information sessions and tech talks for top employers in SJSU Handshake under events.
Prepare to impress employers during interviews.	Interview with Confidence, ADM 255 TH 9/27 12pm-1pm TU 10/30 3:30pm-4:30pm W 11/28 12pm-1pm Styled for Success with JCPenney Professional image advice TU 10/9 11-2pm SU Room 1	Interview Guide Big Interview (online mock interview tool)

To get personalized assistance on any of the IFC goals, join drop-in career coaching at several locations around campus or make a career coaching appointment in SJSU Handshake.

Appendix G: Pre- and Post-Intervention Survey Questions

Introductory language
To complete this stage of the Internship Fitness Challenge, please complete the following brief (5-minute) survey. This survey as well as specific questions in the survey are optional.

Survey questions sent through Qualtrics survey tool
Questions 1 and 2 adapted from Professional Development Engagement Scale, (Blau, Blessley, Kunkle, Schirmer, & Regan, 2017). Questions 8, 9, 10, 11, and 13 adapted from Job Search Self-efficacy Scale (Saks, Zikic, & Koen, 2015)

Research Question	Question Number	Question	Response Format	Survey Phase
1, 2	1	Are you a member of a student professional organization at SJSU?	Yes, No	Pre, Post
1, 2	2	How many student professional organization meetings did you attend this semester?	Dropdown list of whole numbers	Post
1	3	To how many internship opportunities did you apply this semester?	Dropdown list of whole numbers	Post
1	4	In how many internship interviews did you participate this semester?	Dropdown list of whole numbers	Post
1	5	How many internship offers did you receive this semester?	Dropdown list of whole numbers	Post
1	6	Did you accept an internship offer this semester?	[Yes, No]	Post
2	7	How many previous internships, co-ops, or practicums have you completed while at SJSU?	Dropdown list of whole numbers	Pre

(continued)

Research Question	Question Number	Question	Response Format	Survey Phase
2	8	I am confident I can find several sources of internships.	4-point Likert scale [Strongly Disagree, Disagree, Agree, Strongly Agree]	Pre, Post
2	9	I am confident I can prepare a résumé to increase my chances of being interviewed	4-point Likert scale [Strongly Disagree, Disagree, Agree, Strongly Agree]	Pre, Post
2	10	I am confident I can organize and start my internship search.	4-point Likert scale [Strongly Disagree, Disagree, Agree, Strongly Agree]	Pre, Post
2	11	I am confident I can prepare a conversation starter to attract the interest of employers.	4-point Likert scale [Strongly Disagree, Disagree, Agree, Strongly Agree]	Pre, Post
2	12	I am confident I can interact productively with employers at a job/internship fair.	4-point Likert scale [Strongly Disagree, Disagree, Agree, Strongly Agree]	Pre, Post
2	13	I am confident I can prepare to impress employers during interviews.	4-point Likert scale [Strongly Disagree, Disagree, Agree, Strongly Agree]	Pre, Post
3	14	How many hours do you work in a typical week?	Dropdown list of whole numbers Not employed (skip employment questions)	Pre

(continued)

Research Question	Question Number	Question	Response Format	Survey Phase
3	15	What is your primary reason for being employed?	(Pick one.) To pay for essential living expenses, like rent and groceries To pay for another person's essential living expenses To pay for non-essential expenses, like eating out or traveling To build work experience To build a savings or investment account Other: [blank]	Pre
3	16	How long is your daily, one-way commute to campus *in minutes*?	Dropdown list of whole numbers	Pre
3	17	After my commute to campus, class/study time, and work schedule, it is difficult to find time for other SJSU activities.	4-point Likert scale [Strongly Disagree, Disagree, Agree, Strongly Agree]	Pre
3	18	I feel overwhelmed by my responsibilities.	4-point Likert scale [Strongly Disagree, Disagree, Agree, Strongly Agree]	Pre
4	19	I have completed previous workshops or training on how to search for internships.	(Pick one.) Yes No	Pre
4	20	My current employment is related to my career goals.	4-point Likert scale [Strongly Disagree, Disagree, Agree, Strongly Agree]	Pre

Appendix H: Thank You Email

Hello [Student Name],

You did it!

You completed the 12-week Internship Fitness Challenge!

To reflect on and share your progress, please complete this **post-program survey** **by December 8.** At the end of the post-program survey, you will find directions on where to pick up your snazzy sneaker key chain.

If you secured an internship during the IFC, I offer big congratulations! If you didn't secure an internship, don't lose heart. Draw on the same initiative and courage that inspired you to sign up for the IFC to continue your search. Employers will keep posting internships in SJSU Handshake and will be back on campus for spring job/internship fairs. The career center resources you discovered in the IFC remain available to you throughout this journey. Don't hesitate to stop by the career center for guidance and support.

Sincerely,

Catherine Voss Plaxton
Director, SJSU Career Center
catherine.vossplaxton@sjsu.edu
(408) 924-6051

Appendix I: Intervention Schedule and Script

Week	CSO Events	Message Date	Treatment Group Message Content and Nudge Technique	Control Group Message Content
Registration Period 8/19/18 to 8/31/18		8/19/18	Internship Fitness Challenge flyer, Appendix C, distributed in paper and electronic form through campus. Internship Fitness Challenge invitation email with informed consent/registration form link and event posting distributed by SJSU Handshake, Appendix D and Appendix E. Nudge: emotional heuristic, anchoring, social norms, commitment heuristic, and loss aversion	
Week 1 9/1/18 Goal: Kick Off		9/1/18	Welcome email sent through SJSU Handshake, Appendix F Nudge: certainty effect, commitment heuristic	
Week 2 9/2/18 to 9/8/18 Goal: Prepare a résumé to increase your chances of being interviewed.		9/3/18	*Welcome to the Internship Fitness Challenge (IFC)! Check email for road map on 6 goals for internship prep. Complete short pre-survey, too. Here we go!* Nudge: emotional heuristic	*Welcome to the Internship Fitness Challenge (IFC)! Check email for road map on 6 goals for internship prep. Complete short pre-survey, too.*
		9/7/18	*Résumés reveal your hopes. Find "launch your career" page at one.sjsu.edu for Résumé Guide. Start a fab résumé at 9/12, 12PM résumé workshop, ADM 201.* Nudge: emotional heuristic	*Find "launch your career" page at one.sjsu.edu for Résumé Guide. Start a résumé at 9/12, 12PM résumé workshop, ADM 201.*

(continued)

Week	CSO Events	Message Date	Treatment Group Message Content and Nudge Technique	Control Group Message Content
Week 3 9/9/18 to 9/15/18 Goals: Prepare a conversation starter to attract the interest of employers. Interact productively with employers at a job/ internship fair.	9/11/18 Make Successful Connections/ Job Fair Success Workshop 9/12/18 Résumé Studio 9/13/18 Business & Government Job/Internship Fair	9/9/18	*Your gain! Employers want to meet you. Bring résumés to job/internship fair on 9/13, 12PM in SU. Job fair prep on 9/11, 12PM. Details in sjsu.joinhandshake.com.* Nudge: certainty effect	*Bring résumés to job/internship fair on 9/13, 12PM in SU. Job fair prep on 9/11, 12PM. Details in sjsu.joinhandshake.com.*
		9/12/18	*Tomorrow: See all the Internship Fitness Challengers at the Bus/Gov fair. 100+ more employers coming on 9/18 & 9/19. Mention IFC to skip to front of the line!* Nudge: social norm, loss aversion, certainty effect, reference point, incentives	*Tomorrow: Join the Business & Government Job/Internship Fair at 12PM in Student Union. More job fairs on 9/18 and 9/19.*
Week 4 9/16/19 to 9/22/18 Goals: Interact productively with employers at a job/ internship fair.	9/18/18 and 9/19/18 Engineering & Science Job/ Internship Fair	9/17/18	*Don't miss 9/18 & 9/19 job/internship fairs. 100s of Challengers came to the fair last week. Prep résumés and conversation starters. Mention IFC to skip line!* Nudge: loss aversion, social norm, commitment heuristic, incentives	*Remember 9/18 & 9/19 job/internship fairs. Prep résumés and conversation starters.*
		9/20/18	*Internship searching is a marathon, not a sprint. Pace yourself & keep moving. Job/internship fairs are just the start. Next week: Interview prep 9/27, 12PM.* Nudge: disposition effect.	*Next week: Join interview prep 9/27, 12PM.*

(continued)

Week	CSO Events	Message Date	Treatment Group Message Content and Nudge Technique	Control Group Message Content
Week 5 9/23/18 to 9/29/18 Goal: Prepare to impress employers during interviews.	9/27/18 Interview with Confidence Workshop	9/23/18	*Interviewing is scary. Graduating w/no internships = nightmare! Go to 9/27, 12PM workshop. Find "launch your career" page @one.sjsu.edu for Interviewing Guide.* Nudge: anchoring, loss aversion	*Go to 9/27, 12PM interviewing workshop. Find "launch your career" page at one.sjsu.edu for Interviewing Guide.*
		9/26/18	*9/27, 12PM Interview with Confidence workshop. Details in sjsu.joinhandshake.com. I heard you had great conversations with employers at the fairs. Yes!* Nudge: social norms, emotional heuristic	*9/27, 12PM Interview with Confidence workshop. Details in sjsu.joinhandshake.com.*
Week 6 9/30/18 to 10/6/18 Goal: Find several sources of internships.	10/2/18 Find Your Career Path Workshop	10/1/18	*73% of grads work in fields unrelated to their majors. Internships are for career exploration: take some risks! Explore more careers at 10/2, 3:30PM workshop.* Nudge: social norms, anchoring	*Internships are for career exploration. Explore more careers at 10/2, 3:30PM workshop.*
		10/4/18	*What are you missing? Our career coaches have helped many 1000s succeed in their searches. Make an appointment for personal help today in sjsu.joinhandshake.com* Nudge: loss aversion, certainty heuristic	*Make a career coaching appointment for personal help today in sjsu.joinhandshake.com.*

(continued)

Week	CSO Events	Message Date	Treatment Group Message Content and Nudge Technique	Control Group Message Content
Week 7 10/7/18 to 10/13/18 Goal: Prepare to impress employers during interviews.	10/9/18 Styled for Success JCPenney	10/7/18	*Amaze recruiters! Join 10/9, 11-2 interview dress event. Find "launch your career" page at one.sjsu.edu for tips. No $ for clothes? Email careerhelp@sjsu.edu.* Nudge: social norms, anchoring	*Join 10/9, 11-2 interview dress event. Find "launch your career" page at one.sjsu.edu for attire tips. No $ for clothes? Email careerhelp@sjsu.edu.*
		10/10/18	*Unsure how formally to dress for an interview? Ask the recruiter. They'll appreciate that you care enough to ask. Next: 10/17 internship-search workshop.* Nudge: social norms	*Unsure how formally to dress for an interview? Ask the recruiter. Next: 10/17 internship-search workshop.*
Week 8 10/14/18 to 10/20/18 Goal: Organize and activate your internship search.	10/17/18 Job & Internship Search Workshop	10/14/18	*Keep your commitment to find an internship. Make a search plan. Apply to internships weekly. Find "launch your career" page at one.sjsu.edu for Search Guide.* Nudge: priming, commitment heuristic	*Make an internship-search plan. Apply to internships weekly. Find "launch your career" page at one.sjsu.edu for Search Guide.*
		10/17/18	*Join fellow IFCers at the internship-search workshop today, 12PM! Details in sjsu.joinhandshake.com. Search "career coaching" at sjsu.edu for personal help.* Nudge: familiarity heuristic, social norm	*Join the internship-search workshop today, 12PM. Details in sjsu.joinhandshake.com. Search "career coaching" at sjsu.edu for personal search help.*

(continued)

Week	CSO Events	Message Date	Treatment Group Message Content and Nudge Technique	Control Group Message Content
Week 9 10/21/18 to 10/27/18 Goal: Organize and activate your internship search.	10/21/18 Find Your Career Path	10/22/18	*Your application is most likely to be seen by a recruiter in the first three days an internship is posted. Upload your résumé to SJSU Handshake and apply today.* Nudge: loss aversion, scarcity heuristic	*Upload your résumé to SJSU Handshake and apply to internships today.*
		10/25/18	*You ten years older: why didn't you apply to more internships? You today: because I wanted to (fill in blank) instead. Build your future and apply now!* Nudge: reference point, loss aversion	*Build your future and apply to internships now.*
Week 10 10/28/18 to 11/3/18 Goal: Find several sources of internships.	10/29/18 Job & Internship Search Workshop 11/2/18 First Friday Photo Booth	10/28/18	*4/5 of Internship Fitness Challengers have sent at least three applications. Keep it up! Join another internship-search workshop tomorrow, 3:30PM.* Nudge: social norms, availability heuristic	*Join another internship-search workshop tomorrow, 3:30PM.*
		11/1/18	*Source fab internships via social media. Get snazzy photo for your profile on Friday, 9-noon. Find "launch your career" page at one.sjsu.edu for Search Guide.* Nudge: availability heuristic, emotional heuristic	*Source internships via social media. Get photo for your profile on Friday, 9-noon. Find "launch your career" page at one.sjsu.edu for Search Guide.*

(continued)

Week	CSO Events	Message Date	Treatment Group Message Content and Nudge Technique	Control Group Message Content
Week 11 11/4/18 to 11/10/18 Goal: Find several sources of internships.	11/8/18 Networking & Informational Interviews Workshop	11/4/18	*Some interviews go well and some are experiences to learn from. Practice builds luck. Go to "career center apps" and practice with Big Interview app.* Nudge: emotional heuristic, disposition effect, availability heuristic	*Some interviews go well and some are experiences to learn from. Go to "career center apps" and practice with Big Interview app.*
		11/7/18	*Study: 20% of college students found opportunities from networking. Learn to network confidently at 12PM workshop tomorrow.* Nudge: anchoring, social norms	*Learn to network confidently at 12PM workshop tomorrow.*
Week 12 11/11/18 to 11/17/18 Goal: Prepare to impress employers during interviews.	11/14/18 Résumé Studio	11/11/18	*Interview poll: you learned the more you interview the better you get. It pays to get interview experience early. 11/14 résumé workshop to improve your résumé.* Nudge: social norms, certainty effect, availability heuristic	*Interview poll: you learned the more you interview the better you get. Join 11/14 résumé workshop to improve your résumé.*
		11/14/18	*You have power to sway an employer's decision after interviews. A polite thank you note and a later inquiry on status can impress potential employers.* Nudge: social norms, certainty effect	*Follow up after an interview with a polite thank you note and a later inquiry on status.*

(continued)

Week	CSO Events	Message Date	Treatment Group Message Content and Nudge Technique	Control Group Message Content
Week 13 11/18/18 to 11/24/18		11/18/18	*Reflect on what you have gained in the IFC. Grow your chances; expand your search this spring. Truth: You will get none of the opportunities you don't pursue!* Nudge: reference point, disposition effect	*Reflect on what you have learned in the Internship Fitness Challenge. Grow your chances; expand your search this spring.*
		11/21/18	*Remember that 67% of SJSU grads had internships. You are well prepared to continue your search for one of the 1,000+ internships posted each month in Handshake.* Nudge: disposition effect, social norms, positive self-image	*You are well prepared to continue your search for one of the many internships posted each month in Handshake.*
11/25/18 to 12/8/18		11/30/18	*Check email for final steps of the Internship Fitness Challenge. Congrats to the many who already took the final steps and earned their gifts!* Internship Fitness Challenge thank you email and post-intervention survey, Appendix H and Appendix G Brief reminders sent on 12/3/19, 12/6/18, and 12/8/19.	

Appendix J: Data Structure, Sources, and Coding

Number	Variable	Source	Type	Coding
1.1	Group assignment		Nominal	
		PDE input 1: Education		
1.2	Number of career- and professional- development workshops attended	SJSU Handshake	Ratio	1=1.25 hr.
1.3	Number of career advising sessions attended for all topics except résumé-writing and interviewing	SJSU Handshake	Ratio	1=.5 hr.
1.4	Number of self-assessment and career exploration modules completed in Focus2	Focus2	Ratio	1=.25 hr.
1.5	Number of career advising sessions attended for résumé - writing	SJSU Handshake	Ratio	1=.5 hr.
1.6	Number of industry mock interview events attended	SJSU Handshake	Ratio	1=1.25 hr.
1.7	Number of career advising sessions attended for interviewing	SJSU Handshake	Ratio	1=.5 hr.
1.8	Account created in Big Interview, an online mock interview tool	Big Interview	Nominal	No=0 hr.; Yes=.25 hr.
1.9	PDE input score 1: Education	Computation	Ratio	Sum of coded responses, variables 1.2 to 1.8
		PDE input 2: Networking and mentoring		
1.10	Post-intervention new membership in student professional development organization (SPO)	Post-intervention survey	Nominal	No=0 hr.; Yes=1 hr.
1.11	Number of SPO meetings attended	Post-intervention survey	Ratio	1=1.5 hr.

(continued)

Number	Variable	Source	Type	Coding
1.12	Number of other networking events attended	SJSU Handshake	Ratio	1=1.5 hr.
1.13	PDE input 2 score: Networking and mentoring	Computation	Ratio	Sum of coded responses, variables 1.10 to 1.12
		PDE input 3: Measured internship searching		
1.14	Number of résumé s uploaded in SJSU Handshake	SJSU Handshake	Ratio	1=.15 hr.
1.15	Profile updated in SJSU Handshake	SJSU Handshake	Nominal	No=0 hr.; Yes=1 hr.
1.16	Number of applications submitted in SJSU Handshake	SJSU Handshake	Ratio	1=.15 hr.
1.17	Number of job/internship fairs attended	SJSU Handshake	Ratio	1=2.5 hr.
1.18	Number of employer information sessions attended	SJSU Handshake	Ratio	1=1.5 hr.
1.19	PDE input 3 score: Measured internship-search activities	Computation	Ratio	Sum of coded responses, variables 1.14 to 1.18
		PDE input 4: Self-reported internship searching		
1.20	Total applications submitted for internships (self-report of all application methods)	Post-intervention survey	Ratio	1=1 hr.
1.21	Number of internship interviews completed	Post-intervention survey	Ratio	1=2 hr.
1.22	PDE input 4 score: Self-reported internship-search activities	Computation	Ratio	Sum of coded responses, variables 1.20 and 1.21
		PDE output scores 5 and 6: internship-search results		
1.23	Number of internship offers received	Post-intervention survey	Ratio	1=1

(continued)

Number	Variable	Source	Type	Coding
1.24	Internship offer accepted	Post-intervention survey	Nominal	No=0; Yes=1
		Pre-intervention perceived behavioral control		
2.1	I am confident I can find several sources of internships	Pre-intervention survey	Ordinal	Strongly disagree = 1; Disagree = 2; Agree = 3; Strongly agree = 4
2.2	I am confident I can prepare a résumé to increase my chances of being interviewed	Pre-intervention survey	Ordinal	Same as 2.1
2.3	I am confident I can organize and activate my internship search.	Pre-intervention survey	Ordinal	Same as 2.1
2.4	I am confident I can prepare a conversation starter to attract the interest of employers.	Pre-intervention survey	Ordinal	Same as 2.1
2.5	I am confident I can interact productively with employers at a job/internship fair.	Pre-intervention survey	Ordinal	Same as 2.1
2.6	I am confident I can prepare to impress employers during interviews.	Pre-intervention survey	Ordinal	Same as 2.1
2.7	Pre-intervention perceived behavioral control score	Computation	Interval	Mean of coded responses, variables 2.1 to 2.6
		Post-intervention perceived behavioral control		
2.11	I am confident I can find several sources of internships	Post-intervention survey	Ordinal	Same as 2.1
2.12	I am confident I can prepare a résumé to increase my chances of being interviewed	Post-intervention survey	Ordinal	Same as 2.1
2.13	I am confident I can organize and activate my internship search.	Post-intervention survey	Ordinal	Same as 2.1
2.14	I am confident I can prepare a conversation starter to attract the interest of employers.	Post-intervention survey	Ordinal	Same as 2.1

(continued)

Number	Variable	Source	Type	Coding
2.15	I am confident I can interact productively with employers at a job/internship fair.	Post-intervention survey	Ordinal	Same as 2.1
2.16	I am confident I can prepare to impress employers during interviews.	Post-intervention survey	Ordinal	Same as 2.1
2.17	Post-intervention perceived behavioral control score	Computation	Interval	Mean of coded responses, variables 2.11 to 2.16
		Ability/capacity factors of actual control		
3.1	Enrollment status	PeopleSoft	Ordinal	Part-time (6 units or less) =1; Full-time (more than 6 units) =2
3.2	Hours worked in typical week	Pre-intervention survey	Ratio	1=1 hr.
3.3	Primary reason for employment	Pre-intervention survey	Nominal	
3.31	To pay for essential living expense, like rent and groceries	Pre-intervention survey	Nominal	No=0; Yes=1
3.32	To pay for another person's essential living expenses	Pre-intervention survey	Nominal	No=0; Yes=1
3.33	To pay for non-essential expenses, like eating out or traveling	Pre-intervention survey	Nominal	No=0; Yes=1
3.34	To build work experience	Pre-intervention survey	Nominal	No=0; Yes=1
3.35	To build a savings or investment account	Pre-intervention survey	Nominal	No=0; Yes=1
3.36	To generate nondiscretionary income	Computation	Nominal	Sum of coded responses, variables 3.31 and 3.32

(continued)

Number	Variable	Source	Type	Coding
3.37	To generate discretionary income	Computation	Nominal	Sum of coded responses, variables 3.33 and 3.35
3.4	One-way commute time in minutes	Pre-intervention survey	Interval	
3.5	Perception of work and commute hours creating time limitations for engagement in SJSU activities	Pre-intervention survey	Ordinal	Strongly disagree = 1; Disagree = 2; Agree = 3; Strongly agree = 4
3.6	Perception overwhelm due to responsibilities	Pre-intervention survey	Ordinal	Same as 3.5
3.7	Major	PeopleSoft	Nominal	
3.71	Meta-major: Business/accounting and finance Included majors: Accounting, Accounting Information Systems, Finance	PeopleSoft	Nominal	
3.72	Meta-major: Business/innovation and management Included majors: Entrepreneurship, General Business, Global Operations Management, Human Resource Management, International Business, Management, Management Information Systems	PeopleSoft	Nominal	
3.73	Meta-major: Business/marketing and business analytics Included majors: Business Analytics, Marketing	PeopleSoft	Nominal	
3.74	Meta-major: Child and adolescent development Included majors: Child and Adolescent Development, Child and Adolescent Development/Preparation for Teaching	PeopleSoft	Nominal	

(continued)

Number	Variable	Source	Type	Coding
3.75	Meta-major: Computing and information technology Included majors: Computer Engineering, Computer Science, Software Engineering	PeopleSoft	Nominal	
3.76	Meta-major: Engineering Included Engineering Majors: Aerospace, Biomedical, Chemical, Civil, Electrical, General, Industrial & Systems, Industrial Tech/Comp Electronics, Materials, Mechanical	PeopleSoft	Nominal	
3.77	Meta-major: Health and nutrition Included Majors: Kinesiology, Applied Nutrition, Dietetics, Public Health, Health Services Administration	PeopleSoft	Nominal	
3.78	Meta-major: Humanities and the arts Included Majors: Design Studies, Digital Media Art, Photography, Interior Design, Asian Studies, Liberal Arts, Japanese	PeopleSoft	Nominal	
3.79	Meta-major: Mathematics and physical sciences Included Majors, Applied Mathematics, Biological Science, Chemistry, Chemistry/Biochemistry, Mathematics, Physics	PeopleSoft	Nominal	

(continued)

Number	Variable	Source	Type	Coding
3.710	Meta-major: Social sciences Included Majors: Anthropology, Behavioral Science, Communication Studies, Economics, Environmental Studies, History, Journalism, Justice Studies, Political Science, Psychology, Public Relations, Radio-Television-Film, Sociology	PeopleSoft	Nominal	
3.711	Meta-major: Undeclared Included Majors: Continuing Education, Undergraduate Studies	PeopleSoft	Nominal	
	Environment factors of actual control			
3.8	College	PeopleSoft	Nominal	
3.81	Business	PeopleSoft	Nominal	
3.82	Education	PeopleSoft	Nominal	
3.83	Engineering	PeopleSoft	Nominal	
3.84	Health and Human Services	PeopleSoft	Nominal	
3.85	Humanities and the Arts	PeopleSoft	Nominal	
3.86	Science	PeopleSoft	Nominal	
3.87	Social Sciences	PeopleSoft	Nominal	
3.88	Undeclared	PeopleSoft	Nominal	
	Demographic background factors			
4.1	Gender	PeopleSoft	Nominal	
4.2	Race/Ethnicity	PeopleSoft	Nominal	
4.21	Asian/Asian-American	PeopleSoft	Nominal	
4.22	Black or African-American	PeopleSoft	Nominal	

(continued)

Number	Variable	Source	Type	Coding
4.23	Latino(a)	PeopleSoft	Nominal	
4.24	Native American/Pacific Islander	PeopleSoft	Nominal	
4.25	White/Caucasian	PeopleSoft	Nominal	
4.3	Age during intervention	PeopleSoft	Interval	
		Experiential background factors		
4.4	Generation in family to attend college	PeopleSoft	Ordinal	
4.5	First-time frosh or transfer student	PeopleSoft	Nominal	
4.6	Year in college	PeopleSoft	Ordinal	
4.7	Previous workshops or training completed on internship searching	Pre-intervention survey	Nominal	
4.8	Pre-intervention membership in student professional development organization (SPO)	Pre-intervention survey	Nominal	
4.9	Number of formal internships or co-ops completed while in college	Pre-intervention survey	Ratio	
4.10	Current job or internship is related to career goals	Pre-intervention survey	Ordinal	Strongly disagree = 1; Disagree = 2; Agree = 3; Strongly agree = 4