CAREER INFORMATION SYSTEM UTILIZATION AND HIGH SCHOOL STUDENTS' VOCATIONAL SKILLS SELF-EFFICACY, OUTCOME EXPECTATIONS, WORK HOPE, CAREER PLANNING, AND CAREER DECISION-MAKING DIFFICULTIES

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DISSERTATION ABSTRACT

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Title: Career Information System Utilization and High School Students' Vocational Skills Self-Efficacy, Outcome Expectations, Work Hope, Career Planning, and Career Decision-Making Difficulties

The aim of the present study was to examine the effects of Career Information System (CIS) on high school students' vocational skills self-efficacy, outcome expectations, work hope, career planning, career decision-making difficulties and postsecondary plans. CIS is an internet-based computer system of occupational and educational information designed to help users become more knowledgeable about the labor market and education system, as well as provide career planning support. Students from two high schools participated in the study. Participants at School A were first-year students who completed the Interest Profiler module of CIS. Participants at School B were first-year students who completed the Interest Profiler, IDEAS, SKILLS, Reality Check, and Work Importance Locator modules of CIS. First-year students who did not participate in the CIS intervention served as the control group in both schools.

Participants in both schools who utilized the CIS intervention demonstrated a number of significant differences compared to control group participants at posttest. School A treatment participants' vocational outcome expectations and work hope were higher and career decision-making difficulties (i.e. inconsistent information and lack of information) were lower compared to control participants. School A treatment group

participants were also more likely to indicate postsecondary educational plans of specialized training, 2-year community college, or 4-year college, instead of no education plans, compared to control group participants. School B treatment participants' vocational skills self-efficacy was significantly higher than control participants at posttest. Treatment group participants at both schools demonstrated more changes in their occupational interests compared to control group participants at posttest. The effects of CIS did not vary as a function of race/ethnicity or socioeconomic status in regards to any of the career outcome variables in either school. Implications for the use of CIS among first-year high school students will be discussed and suggestions for future research will be provided.

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“I liked it. I was good at it. And I was really - I was alive” (Gilligan, 2013)

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CHAPTER I

INTRODUCTION

The benefits of career interventions have been established (Whiston, Brecheisen, & Stephens, 2003; Whiston, Sexton, & Lasoff, 1998), particularly within school-based career education settings (Helwig, 2004). Career interventions are defined as "any treatment or effort intended to enhance an individual's career development or to enable the person to make better career-related decisions" (Whiston & Wendi, 2006, p. 119). Several types of career interventions are utilized for career development purposes, including individual career counseling, workshops, career classes, computer applications, and self-administered inventories (Whiston & Wendi, 2006). School-based career interventions have been associated with increases in students' career development skills and academic success (Choi, 2012; Choi, Kim, & Kim, 2015), and career decision-making and vocational skills self-efficacy (McWhirter, Rasheed, & Crothers, 2000).

Career interventions (e.g. individual, group, workshop, counselor-free computer programs) vary with respect to degrees of effectiveness and efficiency. Whiston, Sexton, and Lasoff (1998) conducted a meta-analysis of career interventions (47 studies and 4,660 participants in total) to assess the effects of treatment factors (e.g. intervention modality, treatment dosage). They found an overall effect size of .45. Analyses by intervention type indicated that individual career counseling had the largest effect size (d = .75), followed by group counseling (d = .57), computer interventions (d = .41), career workshops (d = .22), class interventions (d = .15), and self-directed interventions (d = .11). Whiston and colleagues (1998) concluded that individual career counseling was

most effective, while computer interventions were the most cost-effective.

Although identifying the most efficacious career interventions is important, it is also necessary to examine efficient and cost-effective treatment modalities that may benefit greater numbers of individuals and communities. Career development modalities that are both effective as well as efficient may be more accessible to larger populations, particularly those with limited financial resources (McLaren, 2013). Computer-assisted career guidance systems (CACGSs) and career information delivery systems (CIDS) are among the most efficient approaches to providing career information and development (McLaren, 2013; Whiston et al., 1998). Internet delivery of career development interventions within a public school context can circumvent various geographical, psychological, physical, and financial obstacles to accessing counseling services and interventions (Mallen, Vogel, Rochlen, & Day, 2005). As such, establishing empirical evidence for effective and accessible internet-based career development interventions is a salient goal (Herman, 2010). The aim of the present study was to contribute to the literature on the effectiveness of internet-based career development interventions among high school students.

The present study evaluated the effectiveness of specific modules (i.e. Interest profiler, IDEAS, Work Importance Locator, Skills, and Reality Check) of a widely used CACGS: Oregon Career Information System (CIS). This study comprised an evaluation of CIS modules, including self-assessments and corresponding occupational and educational information, across two distinct applications of CIS among freshmen students in two Oregon high schools. Changes in vocational skills self-efficacy, outcome expectations, work hope, and career planning and career knowledge as a function of

exposure to CIS modules were assessed. This study contributes to the CACGSs literature by 1) providing data that associates use of select CIS modules with specific outcomes among first-year high school students, 2) assessing for differences as a function of gender, race/ethnicity, and SES, and 3) providing findings from a high school setting to emphasize external validity.

The literature review is organized as follows. First, I describe the current status of research on such career interventions. Second, I provide an overview of Oregon Career Information System (CIS) and the modules that were evaluated: IDEAS, Interest Profiler, SKILLS, Reality Check, and Work Importance. Third, I describe the theoretical framework for the CIS intervention and provide a rationale for the selected outcome measures. Finally, the research questions and proposed hypotheses are described.

Computer-Assisted Career Guidance System (CACGS)

Computerized career interventions are designed to provide various aspects of the career guidance process, with some interventions focused primarily on one component (e.g. information delivery), while others offer comprehensive modules intended to replicate many facets of career guidance (e.g. assessments, decision-making, and exploration) (Brown, 2006; Gati, Saka, & Krausz, 2001). Although there are a number of self-directed career tools and assessments available online (see for example monster.com), certain products offer more comprehensive systems that include extensive career information and guidance. Sampson and Osborn (2015) identified numerous examples of online multi-element career interventions including computer-assisted career guidance systems (CACGSs), integrated career planning systems, and career information delivery systems (CIDS). In this paper, I use the term CACGS to describe all of these

types of computerized career interventions. A CACGS, as described by Sampson and Osborn, includes three primary components: (a) assessment, (b) search for options, and (c) information delivery. These three components are integrated such that the information from each component is used to complement another aspect of the system. For example, a CACGS user's career assessment results are used to generate relevant educational program options and general information about specific occupations (Gore & Leuwerke, 2008; Niles & Harris-Bowlsbey, 2013; Sampson, Lumsden, Carr, & Rudd, 1999). Along with these three components, CACGSs may provide additional features: educational and career plans, résumé builders, interviewing practice, and career portfolios. Computer-assisted interventions such as CACGSs provide a number of potential benefits in the context of career counseling including 1) extensive and up-to-date information; 2) easily accessible information that can be retrieved by selecting specified preferences; and 3) participants can use the various modules at their own pace and developmental stage (Barak, 1999; Gati, Saka, & Krausz, 2001). The format of some CACGSs also includes built-in structures that facilitate decision making regarding career and academic pursuits, by providing a framework and guiding users through a step-by-step process (Gati, 1996; Gati, Saka, & Krausz, 2001). CACGSs also allow a user to utilize the program independently to gather information relevant for career self-assessment (e.g. skills and interests) and career exploration (Brown, 2006). CACGSs can be utilized simultaneously by large numbers of participants, which allows for widespread accessibility across different settings (e.g. high schools, school districts).

With the increased use of information technology and widespread usage of computers, there has been a rise in the use of computerized career interventions (Harris-

Bowlsbey & Sampson, 2001; Tinsley, 2000). CACGSs were first developed in the late 1960's and continue to be utilized across academic and career development settings (Harris-Bowlsbey, 2013). In the U.S., several types of CACGSs are utilized across education settings from K-12 to colleges and universities (Luzzo & Pierce, 1996; Dykeman et al., 2001). Currently, most high schools and colleges within Oregon and across the U.S. utilize a CACGS as an element of their career guidance curriculum, particularly within K-12 academic settings (Fowkes, 2007). Despite the extensive use of CACGSs, there has been little research demonstrating the effectiveness of these career guidance tools in supporting individuals' career exploration and development (Bloch, 2006; Fowkes & McWhirter, 2007; Hughes & Karp, 2004; Sampson & Lumsden, 2000, Offer & Sampson,1999). Much of the CACGS literature emphasizes the outcome of user satisfaction, while providing minimal evidence of the effectiveness of such tools in regards to indicators of career development, particularly among K-12 students (Sampson, Rudd, & Reardon, 1998). Given the widespread use of CACGS for career interventions in education settings, it is important to evaluate the extent to which they achieve desired career development outcomes.

In a review of CACGS outcome research, Fowkes and McWhirter (2007) identified obstacles to conducting such research in school settings and limitations in previous CACGS literature. The challenges in conducting outcome research for CACGS include 1) no existing models or common criteria to evaluate the impact of CACGS on individual users, 2) rapid changes in technology that limit the development of research findings that reflect the most current versions of CACGSs, and 3) the flexibility of using various modules or components of a CACGS and time spent (dosage) using a CACGS

means that “treatment” components are not uniform (Fowkes & McWhirter, 2007). Existing CACGS literature also emphasizes user satisfaction, rather than career-related outcome variables, relies heavily on small convenience samples and offers limited examination of differential outcomes among subgroups of CACGS participants (Fowkes & McWhirter, 2007). Among other gaps in knowledge of CACGSs, there is a limited focus on how the effectiveness of career interventions may vary across different subgroups (e.g. race/ethnicity, gender, SES), particularly in computerized treatments (Brown & Ryan Krane, 2000; Fowkes & McWhirter, 2007; Whiston & Rahardja, 2008). Fowkes (2007) posits that CACGS literature has a lack of focus on the influence of demographic factors and notes that sex, ethnicity, and SES are ignored as potential moderating factors in the CACGS literature, despite the established relevance of such factors within career development (Avery, 2006; Leong & Flores, 2013). In a recent review of information technology in career interventions, Sampson and Osborn (2015) identified similar limitations of CACGSs and other comparable computer interventions originally outlined by Fowkes and McWhirter (2007). Sampson and Osborn (2015) also noted that computer applications suffer from limited evidence of career theory use in their development and poor implementation in practice.

Current CACGS Research

Despite obstacles to evaluating CACGS interventions, there has been some evidence associating use of CACGSs with positive career development outcomes. Sampson and Osborn (2015) outlined some examples of effective CACGS interventions which demonstrated increases in career maturity among middle school students (Luzzo & Pierce, 1996), and career-decision-making self-efficacy (Betz & Borgen, 2010; Maples &

Luzzo, 2005), satisfaction with a career choice (Gati, Gadassi, & Shemesh, 2006), and increased vocational identity (Hornyak, 2007) among college students. Likewise, Gati, Saka, and Krausz (2001) found that use of CACGSs reduced career decision-making difficulties, particularly with respect to attainment of pertinent career information among college students. Additional studies of CACGSs support their efficacy as a stand-alone career counseling intervention, although they are more effective when paired with additional counseling (Gati, Saka, & Krausz, 2001; Eveland, Conyne, & Blakney, 1998). Compared to other career interventions, CACGS demonstrate more effective results when used in conjunction with career exploration and planning activities such as group and individual counseling (Taber & Luzzo, 1999). These findings are consistent with Brown and Krane's (2000) five ingredients of career counseling associated with the largest effect sizes. According to this model, the most effective career development interventions include one or more of the following components: work books and written exercises, individualized interpretations and feedback, career information exploration, modeling, and building additional support (Brown & Kane, 2000). Brown and colleagues (2003) further demonstrated the importance of these components within career interventions by presenting additional meta-analytic data that support the conclusions identified by Brown and Kane (2000). CACGSs, including CIS, may be most effective when they provide certain career counseling ingredients (e.g. written exercises, individualized feedback, and career information) and are used in conjunction with additional ingredients (e.g. modeling and additional support) described by Brown and Krane (2000).

CIS Overview

The aim of the present study was to evaluate career development outcomes associated with the use of a specific CACGS in the state of Oregon; Career Information System (CIS). CIS is an online career guidance system that provides occupational and educational information, and career planning tools and support. Currently, there are 560 sites (e.g. employment offices, social service agencies, and schools) that license CIS in the state of Oregon, 294 of which are high schools. Agencies that license CIS utilize it to assist students, clients, customers, and employees with career planning and/or transitions (L. McCoid, personal communication, January 5, 2016). In 2007, Fowkes examined the use of CIS in two distinct high schools in the state of Oregon with regard to vocational skills self-efficacy, career outcome expectations, and career decision-making difficulties. Fowkes (2007) did not find significant differences in these outcome variables, however one potential limitation of the study was the small sample size and the brief intervention assessed (one class session). Since then, CIS has demonstrated positive user satisfaction data; however, no additional studies have been conducted with respect to the potential influence of CIS on career development (L. McCoid, personal communication, January 5, 2016).

The five overarching components of CIS include: 1) career assessments that identify occupations pertinent to the user's skills, interests, and values; 2) occupation and career information; 3) postsecondary programs of study and training and financial aid options; 4) employment resources and listings; and 5) a portfolio comprising all personal information and plans created through the use of CIS. The CIS career assessment tools allow users to identify their unique qualities (e.g. career interests, skills, values) and match them with corresponding occupational and educational information. Below is a

description of each CIS assessment module that will be included in the current study: Interest Profiler, IDEAS assessment, SKILLS assessment, Work Importance Locator, and Reality Check.

Interest Profiler. The Interest Profiler was derived from the Occupational Information Network (O*NET; 2015), a national occupational information database, and has been modified for CIS and mapped to various occupations and relevant information within the state of Oregon (e.g. median wages, demand). Participants indicate whether they like, dislike, or are unsure whether they like various activities, and are then presented with a list of occupations that match their patterns of interest. Then, these interest patterns are mapped on to the six Holland Personality Types. The Holland Personality types, developed by John Holland (1985), are a set of personality types that correspond to certain occupational environments. Holland maintained that both personalities and work environments could be characterized using six basic types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Individuals are provided with 2 or 3 types combined, in order of greatest level, to yield a distinct Holland code, thus a Holland code of SAI (i.e. Social, Artistic, and Investigative) is different from a code of IAS (i.e. Investigative, Artistic, and Social). Upon completing the Interest Profiler, CIS users are provided with their higher rated interest areas and corresponding occupations based on their Holland Personality types. For instance, upon completing the Interest Profiler, a user would be provided with a Holland code of IRC (Investigative, Realistic, and Conventional) and would receive a list of corresponding occupations such as a civil engineer, fire investigator, and climate change analyst.

IDEAS. IDEAS is an acronym for Interest, Determination, Exploration, and Assessment System and this tool is classified as an interest inventory. It was designed to help participants identify their interests and match them with various occupations (CIS, 2015). IDEAS shares several characteristics with the Interest Profiler, one of which is the provision of Holland codes and corresponding occupations. IDEAS goes a step further, however, as the report also organizes the users' interests and occupations into sixteen broad occupational areas (e.g. Mechanical/Fixing, Mathematics, Medical, Writing, Community Service). For example, a user who completes the IDEAS would be provided with their highest rated Holland codes of IRC (Investigative, Realistic, and Conventional) and a further categorization of occupational areas: Investigative (Mathematics, Science, and Medical). The user would then receive a list of corresponding occupations within each occupational area such as accountant, architect, and budget analyst for the mathematics area. The user can then select their preferred occupations and obtain corresponding occupational and educational information (e.g. average wages, required education, demand).

SKILLS. The SKILLS module allows users to identify skills that they have and consider satisfying to utilize. Skills, as defined within CIS as behaviors that can be learned and directed toward a goal. Participants rank order 72 skills options into the top 5 "Very Satisfying," 10 "Moderately Satisfying," and 20 "Somewhat Satisfying" categories, with the remaining skills options leftover. Examples of skills include: writing, speaking, advising, finger dexterity, sound discrimination, and stress tolerance. Once participants have completed this, a list of 30 occupations that utilize their most or more satisfying identified skills is generated. Participants are also provided with Holland codes

that correspond to their highest rated skills. For example, a user who selects several social skills (e.g. social perception, teamwork, and instructing) and management skills (e.g. decision making, persuading, and directing) and ranks them as "Very Satisfying" and "Moderately Satisfying" would then receive a list of 30 occupations that meet their highest rated skills such as sales manager, teacher, and lead office clerk.

Work Importance Locator. The Work Importance Locator is a values clarification tool that has participants rank 20 values statements about work along a 5-point rating scale from "Most Important" to "Least Important." Examples of work values statements include: opportunity for advancement, work alone, do something different every day, and busy all the time. The 20 statements are clustered into six broad work values areas: relationships, independence, recognition, support, working conditions, and achievement. Results yield the participant's top two work values and a list of occupations that satisfy or are congruent with these work values. A user may, for instance, have "independence" and "achievement" rated as their top two work values, and would therefore receive a list of related occupations including real estate agent, news reporter, and musician.

Reality Check. The Reality Check includes a series of questions about spending patterns and personal preferences to allow participants to identify the lifestyles they would like to live and the monthly expenses for this lifestyle as well as a list of occupations with incomes that meet their monthly costs. These questions address various living preferences (e.g. housing, transportation, healthcare, entertainment, saving) and include a number of potential options with corresponding costs. For example, participants will be asked "What type of housing will you need?" and will select one of several

options with average costs including: live at home ($0), 1-bedroom apt. ($650), 2-bedroom apt. ($865), and house ($1115). Living expenses vary by city size and region of the state, thus the Reality Check adjusts for the participants preferred place to live in Oregon. The results of these questions are combined to generate the required monthly income necessary to support the user's lifestyle and preferences. Next, users are provided with a list of occupations that can support that lifestyle, based on the level of education they have indicated that they would like to pursue.

In conjunction with the above career assessment modules, CIS provides up-to-date information regarding occupational and educational opportunities and required qualifications. Oregon-specific information about an estimated 600 occupation titles is available and includes current employment openings, average wages, future occupational outlooks, common hiring practices, licensing, as well as necessary skills, abilities, and knowledge for each particular occupation. According to CIS, the occupational titles listed on the website account for over 95% of the labor market in Oregon. Information about every postsecondary program of study and training in the state is also available and includes topics such as admission requirements and costs as well as scholarship and financial aid opportunities with relevant inclusion criteria (e.g. individual characteristics and experiences). This collective information is maintained and updated every 1-2 years by two professional CIS information analysts. The occupational and educational information found on the CIS website is linked to other relevant career guidance modules (e.g. self-assessments) and creates an integrated system. This integration process occurs through either self-direction (e.g. exploring the resulting occupations after a completed self-assessment) or with guidance from an instructor with the use of career planning

activities. For example, a high school instructor may have students select their top occupational choices and have them explore the relevant information necessary to inform their career path (e.g. required education, average salary, rate of employment).

Although all of these components and modules are made available to agencies that license CIS, not all components are always utilized in a comprehensive or standardized manner. Agencies ultimately decide which components and modules to utilize with participants. For example, a school may utilize only one of the modules (e.g. skills assessment), while another school may use different modules (e.g. Interest Profiler and Reality Check) with students. Similarly, one school may have a counselor utilize certain modules of CIS with students on a case-by-case basis, while another school may have all students within a grade-level complete certain modules. CIS is intentionally designed to be adaptable to various settings and available resources (e.g. class time or career counselors). Fowkes and McWhirter (2007) highlighted this common characteristic among CACGSs and noted the challenges with measuring the effectiveness of a treatment with such variability in its application. The nature of CIS allows for maximum flexibility in its application across various settings, however this flexibility makes it challenging to specify and compare outcomes across settings.

Despite the clear challenges in measuring the effectiveness of such treatments, there are a number of potential benefits that CIS and other comparable CACGSs offer (Sampson & Osborn, 2015). The collective information within CIS combined with the links to various other external databases provides a user access to extensive career and educational information. The distance service delivery of CIS increases its accessibility for those who live in remote geographic locations with limited access to career

interventions (Sampson, 1998, Sampson & Bloom, 2001). In addition to convenience, CIS and other CACGSs also offer anonymity to the users, which can further reduce potential barriers to access (Gati & Asulin-Peretz, 2011; Sampson, McClain, Dozier, et al., 2013; Tyler & Sabella, 2004). Finally, CACGSs, including CIS, are cost effective and inexpensive for the user (Watts, 2010), given that it is typically free for users enrolled in institutions that license CIS (Clark, Horan, Tompkins- Bjorkman, Kovalski, & Hackett, 2000; Gati & Asulin-Peretz, 2011; Hooley et al., 2010).

Theoretical Framework

The development of CIS was guided by the Cognitive Information Processing model (CIP; Sampson, Peterson, Lenz, & Reardon, 1992), which served as the theoretical framework for conceptualizing the aims and outcomes of CIS as well as provided a rationale for the selection of appropriate career development outcome measures (see Figure 1). CIP is a cognitive-oriented model designed to explain the career decision-making process. CIP involves four information-processing domains (self-knowledge, occupational knowledge, decision-making skills, and metacognitions) and a continuous, repeating five-stage cycle that describes skills necessary for career decision-making (communication, analysis, synthesis, valuing, and execution skills). The aim of the CIP model is to provide a framework for making informed career and life choices, which highlights the importance of problem-solving and decision-making skills that can be used for future choices. The components of the CIP model, particularly self-awareness, occupational knowledge, and decision-making skills, inform various aspects of CIS.

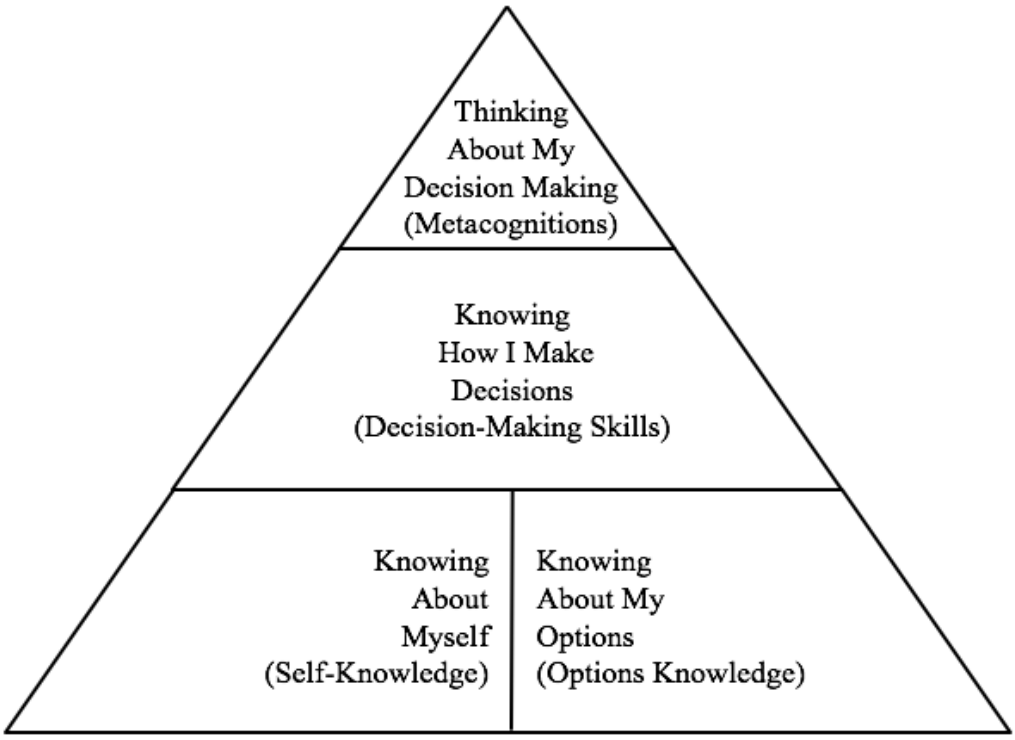

Figure 1. Pyramid of Information Processing

The previously described components of CIS closely align with Sampson and colleagues' (1999) "Pyramid of Information Processing Domains," particularly, knowledge of self (i.e. CIS values, interests, and skills) and knowledge of options (i.e. CIS databases of occupations, programs of study, jobs). Knowledge of self and options consist of what individuals know about themselves and their career options. Individuals' values, interests, and skills can help in identifying specific career paths that match their personal characteristics (Sampson et al., 1999). Similarly, a person's employment preferences (e.g. desired salary) and family situation may also influence their career choices. The previously described assessment modules within CIS (i.e. IDEAS, Interest Profiler, SKILLS, Work Importance Locator, and Reality Check) are designed to provide individuals with a clear picture of their self-knowledge domain as follows: a) IDEAS and Interest Profiler are designed to provide information about their interests and occupations

that match their interests, b) SKILLS identifies their most satisfying skills and occupations that most utilize these skills, c) Work Importance Locator increases awareness of their preferred work values and occupations that would satisfy those work values, and d) Reality Check provides an assessment of their lifestyle costs and how occupations may maintain that lifestyle. With the completion of these self-assessments, users are expected to learn more about themselves and increase their own self-knowledge.

Relatedly, the resulting occupations presented at the completion of each CIS assessment serve as the options knowledge domain described in the Pyramid of Information (e.g. knowledge of specific industries and employment positions). As previously described, CIS users have access to up-to-date information regarding occupational and educational opportunities. Along with specific occupations and programs of study, CIS provides users with general information about types of jobs within a particular field or Holland code type, such as information regarding mechanical/fixing fields within a "Realistic" Holland type occupational field. This is in line with the CIP knowledge domain, such that the CIP approach requires participants to gain knowledge about specific occupations as well as the types of jobs within a particular field or industry. Each of the self-assessments provides users with specific occupations as well as broad types of careers through the Holland type themes. Through exposure to this information database, CIS users are expected to increase their knowledge of employment positions and entire industries relevant to their self-knowledge (e.g. interests, skills, and values). Sampson and colleagues (1999) highlighted the importance of gaining knowledge of options that matches their own self-knowledge to make informed decisions.

The occupations list resulting from the assessments may narrow or broaden the potential options for the user, depending on their developmental stage and goals.

The decision-making domain of CIP involves the process of addressing important problems and making informed decisions (e.g. choosing a career path). This domain includes a detailed decision-making process known as the CASVE cycle, which outlines the decision-making process of CIS. The process of utilizing various components of CIS allows users to narrow their focus about their career options and make decisions about their career pursuits, similar to each aspect the CASVE cycle (communication, analysis, synthesis, valuing, and execution skills). The communication phase involves individuals recognizing that they should make a decision, either through internal cues (e.g., a desired career change) or external cues (e.g., CIS curriculum in school). The analysis phase involves exploring one's personal characteristics and career options, while the synthesis phase involves the integration of personal characteristics with a targeted list of options. Similarly, CIS users explore their personal characteristics and corresponding options, through the self-assessments and their resulting occupations. From there, users select from a targeted list of career options that are based on their assessment results (e.g. a narrowed list of occupations within a "Realistic" Holland type). In the valuing phase, individuals finalize their employment options by identifying specific positions they would want to pursue.

These three phases (analysis, synthesis, and valuing) are accomplished in CIS by means of matching self-assessments and occupational information, and follow-up by selecting a targeted list of potential careers. Instructors utilizing CIS typically require students to complete an activity in which they select one or more occupations and then

identify pertinent information about each occupation based on their assessment results. Finally, the execution phase involves an individual taking direct steps towards their priority list of options in the valuing phase (e.g. sending out résumés or accepting an offer). Although this phase may be applicable for some users of CIS (e.g. individuals entering the job market), this phase may not necessarily apply to users who are early in their career paths (e.g. middle school and high school students). The application of CIS within the setting of the current study (i.e. first-year high school students), aligns with the knowledge foundations, self and options knowledge, and the first four phases of the decision-making domain, which include communication, analysis, synthesis, and valuing.

The meta-cognition domain emphasizes how peoples' reflections or thoughts about decisions may influence the way they pursue their goals (e.g. career pursuits). These thoughts, whether positive or negative, influence the way one may approach the tasks of problem solving and decision making, as well as how they may perceive themselves and their options. Upon completing each module, CIS users are presented with prompts to reflect on their self-assessment and selected occupations. For example, when a CIS user completes the Interest Profiler and demonstrates a high "Investigative" Holland type, the user will be asked to describe his or her thoughts about pursuing a career within this category. Similarly, career counselors or instructors may encourage users to complete career activities that require them to reflect on their career choices. For instance, an instructor may ask students to collect information about a specific occupation and then describe how they would feel about pursuing this career. The meta-cognitive domain highlights how one's own thoughts about their decisions may influence the way they pursue their goals, thus CIS is designed to provide users with the opportunity to

intentionally identify their thoughts throughout their use of CIS and refer back to them in the future to inform their ongoing career decision-making.

Given that the CIP model and CIS modules are the point of interest, it is possible to describe how high school users of these CIS modules should differ if this career development intervention is successful. Specifically, depending upon the component used, users should have greater self-awareness of interests, skills, and values and how these are associated with specific occupations. Since they are high school students, the goal is not to make a career choice, but to explore possibilities and to have greater agency for exploring and obtaining occupational information in the future. Another important outcome would be recognizing connections between their personal characteristics and occupations. In light of these aims the following paragraphs identify a number of common career intervention outcomes that are relevant to first year high school students and that may serve as indicators of the effectiveness of CIS.

Career Development Outcome Indicators

In order to select outcome indicators and measures, I first considered the aims of the CIS tools and the developmental stage of high school first year students. Children and adolescents are not typically pursuing specific jobs, but rather are in the process of learning about themselves, exploring broader occupational paths, and understanding how these are interrelated (Hartung, Porfeli, & Vondracek, 2005; Hirschi et al., 2011). Specifically, first-year high school students should be expanding and exploring career options and learning how to make decisions and plans, rather than actually making career decisions. Second, I reviewed existing research assessing the effects of school-based career interventions and considered whether those outcome measures were in keeping

with the aims of the CIS tools used in this study. Finally, I was guided by the notion of self-efficacy and agency, which are central facets of two career development theories: Social Cognitive Career Theory (Lent & Brown, 1996; Lent, Brown, & Hackett, 1994) and Work Hope Theory, respectively (Juntunen & Wetterson, 2006). High school students with greater self-efficacy related to career exploration, decision-making, and planning are more likely to translate interests into goals and goals to outcomes (Lent & Brown, 1996; Lent, Brown, & Hackett, 1994). Furthermore, high school students with greater motivation or willingness (i.e. agency) to pursue clearly defined career pathways are more likely to pursue desired career outcomes (Juntunen & Wetterson, 2006).

Career-Related Self-Efficacy and Outcome Expectations. Social-cognitive career theory (SCCT; Lent & Brown, 1996; Lent, Brown, & Hackett, 1994) provides a useful theoretical framework for evaluating short-term outcomes of career education for high school students (McWhirter, Rasheed, Crothers, 2000). SCCT is based on Bandura's (1986) social cognitive theory, which emphasizes the interactive relationships among environmental factors, personal factors, and actual behaviors. Furthermore, SCCT integrates contextual factors, learning experiences, self-efficacy and outcome expectations of individuals within a career and academic framework. Learning experiences influence the development of career-related self-efficacy (beliefs about one's own capabilities in career-related domains) and career-related outcome expectations. Learning experiences may include gaining knowledge of occupational information, firsthand and vicarious experiences, performance accomplishments, and career role models (Lent, Brown, & Hackett, 1994). The interaction between career-related self-efficacy and outcome expectations is believed to influence individuals' career goals,

choices, and overall outcomes. Individuals with high career-related self-efficacy and outcome expectations are more likely to become interested in, pursue, and achieve corresponding vocational aspirations, while those with low career-related self-efficacy and outcome expectations are less likely to pursue and meet such goals (Lent, Brown, & Hackett, 1994). It is important to note that self–efficacy expectations are domain specific, so, for example, what raises self-efficacy expectations for being able to make career decisions would not be expected to raise self-efficacy expectations for passing admissions requirements for a particular career.

The collective use of the CIS modules (i.e. self-assessments, occupational and education information, and career plan activity) exposes students to the process of career exploration including researching career options (e.g. available options, salary, education requirements), setting tentative goals, and identifying personal and marketable skills and interests. These experiences are expected to increase student's perceived abilities to continue their career exploration and planning as well as their own confidence in engaging in the career development process (e.g. vocational skills self-efficacy). These experiences should also raise students' expectations about finding work that is meaningful and satisfying to them (vocational outcome expectations). Bandura (1977) highlighted the importance of performance outcomes or past experiences as a source of information that individuals utilize to judge their own capacity to achieve similar tasks. Students who utilize CIS in the class will have firsthand experiences in exploring and selecting career options (e.g. performance outcomes), thus they are potentially more likely to perceive themselves as more capable of effectively engaging in career development process in the future. Previous studies have demonstrated increases in career

decision-making self-efficacy with exposure to a CACGS among college students (Betz & Borgen, 2010, Maples & Luzzo, 2005). Furthermore, self-efficacy is closely tied to outcome expectations, such that students with higher career related self-efficacy are likely to develop higher vocational outcome expectations (Lent, Brown, & Hackett, 1994). Social Cognitive Career Theory guides the following research such that exposure to self-knowledge and options knowledge (i.e. CIS assessments and occupational matching) and a decision-making process (i.e. engaging in more specific exploration by narrowing career options through a career plan activity) are hypothesized to increase students' vocational skills self-efficacy and vocational outcome expectations.

Work Hope. Hope is a core construct within positive psychology and has recently been connected to career decision-making (Juntunen & Wetterson, 2006). Snyder, Irving, and Anderson (1991) defined hope as "a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy) and (b) pathways (plans to meet goals)" (p. 287). Juntunen and Wetterson (2006) integrated career development research with hope theory (i.e. work hope) as a framework for examining individuals' work-related goals, ideas for attaining their work-related goals, and motivation towards acting on those goals. Work hope, as described by Juntunen & Wetterson (2006), is a positive motivational state that is focused on work and work-related goals, which are guided by both agency and the pathways towards achieving those goals. A person with high work hope would be willing and motivated to pursue a specific career path with a clear plan of how to achieve that goal; for example, a student who is interested in becoming a pharmacist would know the education required to become a pharmacist (e.g. postsecondary and graduate education) and would feel

motivated to pursue that path. Hope theory aligns with aspects of Social Cognitive Career Theory, such that self-efficacy is related to the agency aspect of hope, while the pathways align with outcome expectations. The two theories, however, differ in a number of ways as described by Juntenen and Wetterson (2006). Snyder, Rand, and Sigmon (2002) postulate that hope assumes an iterative process between agency and pathways, while Bandura (1986) emphasized the importance of self-efficacy as a predictor of outcome expectations. Furthermore, agency indicates a willingness and motivation to pursue a pathway, rather than a perceived ability to pursue a pathway (i.e. one might have high self-efficacy without explicit intentionality) (Snyder, Rand, and Sigmon, 2002). Self-efficacy is closely related to the agency component of the construct of hope, but not with the pathways component of hope. Including the construct of work hope as an outcome measure may allow for detecting associations between CACGS use and work or career-related agency. Work hope will be assessed in the current study to expand on the existing self-efficacy and outcome expectations literature.

Career Decision-Making Difficulties. Career development interventions informed by the CIP model have been associated with decreased career decision-making difficulties and increased decision-making self-efficacy. Reese and Miller (2006) created a career development course informed by the CIP model that increased career decision-making self-efficacy for obtaining occupational information, setting career goals, and career planning as well as lower levels of perceived career decision difficulties among college students. In a follow-up study, Reese and Miller (2010) demonstrated an even greater increase in the effect size of career decision-making self-efficacy and lowered career decision-making difficulties with a modified intervention informed by the CIP

model. In both studies, Reese and Miller assessed the effectiveness of the CIP-informed interventions using two career decision-making self-efficacy measures: The Career Decision Self-Efficacy Scale- Short form (CDMSES-SF: Betz et al., 1996) and the Career Decisions Difficulties Questionnaire (CDDQ: Gati, Krausz, & Osipow, 1996). The positive outcomes found in career interventions informed by the CIP model provide a rationale for assessing the effectiveness of a computer-assisted career-guidance system (CIS) informed by the same model.

Along with other CIP-informed interventions, exposure to CIS modules (e.g. occupational and educational database information) has the potential to address a number of career decision-making difficulties. Gati and colleagues (1996) proposed a taxonomy of three major career decision-making difficulties categories, including lack of readiness, lack of information, and inconsistent information. In a 2001 study, Gati, Saka, and Krausz examined the utility of a CACGS with a sample of 417 young adults and found a substantial reduction in difficulties related to lack of information, indecisiveness, and unreliable information. Relatedly, the use of CIS allows users to address these identified barriers, particularly limited and inconsistent information. With exposure to self-assessments and related occupational information, CIS is designed to increase user's knowledge about themselves, various occupations, and ways of gaining additional career information, all of which are difficulties previously highlighted by Gati et al. (1996). Career decision-making difficulties will be examined in the current study, given the prior research evaluating CIP-informed interventions and CACGSs as well as the CIS aims proposed to reduce career decision-making difficulties related to world of work information.

Career Planning. CIS is designed to support users in their career exploration and planning (Oregon CIS, 2015), thus it is necessary to examine the role of career planning in relation to CIS use. In addition, previous studies have highlighted the importance of career planning in relation to other career development indicators (Patton & Lokan, 2001; Prideaux & Creed, 2001). For example, high school student's career decision-making self-efficacy has been shown to be associated with career exploration and planning (Creed, Patton, & Prideaux, 2007). Furthermore, it would be beneficial to assess students' self-reported behaviors (e.g. career planning) that may directly contribute to their career pursuits, since the previous variables (e.g. work agency or vocational skills self-efficacy) may not directly assess behaviors contributing to career pursuits. Career planning will be assessed in the current study, given the relationship between career planning and related career development variables as well as the aims of CIS.

In summary, the effectiveness of the CIS intervention will be assessed through the use of established career development indicators, vocational self-efficacy and outcome expectations (McWhirter, Rasheed, Crothers, 2000), work hope (Juntunen & Wetterson, 2006), career decision-making difficulties (Gati, Krausz, & Osipow, 2012), and career planning (Thompson, Linderman, Super, Jordaan, & Myers, 1981). Work hope is hypothesized to expand on self-efficacy, such that it emphasizes intentionality as well as capability (Juntunen & Wetterson, 2006). Career decision-making difficulties will be assessed to explore the relationship between CIS use and changes in participants' career decision making difficulties, given the theorized application of CIS within the Cognitive Information Processing model of career decision-making. Finally, career planning will be assessed to measure any changes in immediate career planning behaviors among

participants after exposure to CIS, since a primary aim of CIS is to increase students' career exploration and planning.

Research Questions

The aim of the following two studies was to examine the relationship between exposure to CIS curriculum and decision-making difficulties, vocational skills self-efficacy, outcome expectations, work hope, and career planning among high school students. There were five research questions for both schools. Each research question and corresponding hypothesis was addressed in both schools, separately, because different CIS modules were used at each school:

1. Is exposure to CIS associated with increases in students' vocational skills self-efficacy, outcome expectations, work hope, and career planning, and decreases in career decision-making difficulties?
2. Do the effects of CIS vary as a function of participant race/ethnicity?
3. Do the effects of CIS vary as a function of SES?
4. Is exposure to CIS associated with changes in identified postsecondary plans?
5. Is exposure to CIS associated with changes in identified occupational goals?

Hypotheses

Hypothesis 1: Students exposed to the CIS intervention in both School A and School B will have higher vocational skills self-efficacy, outcome expectations, work hope, and career planning, as well as lower career decision-making difficulties, relative to their counterparts not exposed to the CIS, at posttest. The use of the CIS modules (i.e. self-assessment, occupational and education information, and career plan activity) expose students to the process of career development including researching career options (e.g.

available options, salary, education requirements), setting tentative goals, and identifying personal interests. These experiences are expected to increase students' confidence in navigating their career exploration and development. Previous studies have demonstrated the effectiveness of CACGSs in increases in career decision-making self-efficacy (Betz & Borgen, 2010, Maples & Luzzo, 2005) and reduced career decision-making difficulties (Gati, Saka, & Krausz, 2001) among college students, therefore it is expected that CIS will have similar results among the current sample's vocational skills self-efficacy and decision-making difficulties. Relatedly, work hope has been highly correlated with career decision-making self-efficacy (Juntenen and Wetterson (2006), thus it is expected that work hope will also demonstrate positive results among the current sample.

Hypothesis 2: White and Asian students are expected to demonstrate greatest effects from exposure to CIS compared to all other racial/ethnic groups, including Latina/o, Black/African-American, American and Alaskan Natives. Previous studies have highlighted the role of race/ethnicity in forming one's career development and attainment (Fouad & Kantamneni, 2008; Juntunen, 2006; Kowkes & McWhirter, 2007; Oregon Department of Education, 2016; Trusty, Ng, & Plata, 2000). Fouad and Byars-Winston (2005) examined 16 studies and found that race and ethnicity was related to perceptions of career opportunities and barriers, such that ethnic minority group members perceived more barriers and fewer career opportunities than White/Caucasian group members. Along with perceptions of career opportunities, the relationship between academic achievement and racial/ethnic backgrounds has been well-established. White and Asian students in the state of Oregon demonstrate both higher graduation rates and higher achievement in math and reading compared to all other ethnic groups (Oregon

Department of Education, 2016). As such, White and Asian students are expected to demonstrate greatest effects from exposure to CIS compared to all other racial/ethnic groups, including Latina/o, Black/African-American, American and Alaskan Natives.

Hypothesis 3: Students with lower SES are expected to demonstrate greater effects from exposure to CIS compared to their higher SES counterparts. Few studies have examined the role of SES in the effectiveness of CACGS for career development. Taber and Luzzo (1999) reviewed 26 studies examining the use of DISCOVER, a specific CACGS intervention, and found that none of them explored the potential differences in effectiveness across socioeconomic groups. There are a number of potential influences that may impact lower SES individuals' career development. In a study by Blustein et al. (2002), individuals from lower SES backgrounds had more barriers to career choices and less access to resources and less support from families and schools compared to those from more affluent backgrounds. As such, additional research into the influence of SES in CACGS interventions is warranted.

In a 2007 dissertation study, McLaren examined the effectiveness of a CACGS plus a workshop among a sample of 609 community college and four-year university students. McLaren (2007) found that career decision-making self-efficacy, outcome expectations, and career decision-making difficulties improved at posttest, particularly among participants reporting lower levels of SES. CACGSs may be particularly useful for participants from lower SES backgrounds, thus it is expected that SES will influence the relationship between CIS exposure and the identified outcome measures.

Hypothesis 4: Students exposed to the CIS treatment in both School A and School B will have more changes in their occupations of interests compared to the control group at

posttest. CIS modules (i.e. self-assessment) provide users with various occupations that match their personal characteristics (e.g. interests, values, and skills). Exposure to various occupations that relate to their own characteristics are expected to increase students' knowledge of available occupations. Treatment participants' exposure to additional occupations are expected to change their occupational goals.

Hypothesis 5: Students exposed to the CIS treatment in both School A and School B will have more changes in their postsecondary education plans compared to the control group at posttest. Postsecondary education plans refer to the following options: no plans, specialized training, military, 2-year community college, and 4-year college. As discussed in hypothesis 1, the collective use of the CIS modules (i.e. self-assessment, occupational and education information, and career plan activity) expose students to the process of career development including researching career options (e.g. available options, salary, education requirements), setting tentative goals, and identifying personal interests. These experiences are expected to increase students' understanding of the academic requirements required to pursue their occupational goals. As such, students are expected to change their postsecondary plans to reflect their occupational goals.

CHAPTER II

METHODS

Research Design

The study occurred in first-year classroom settings in two public high schools in Salem and Roseburg, OR. The two participating high schools utilized CIS within a structured format that was built-in to the regular school curriculum. An intervention group and waitlist control naturally existed at each of the two participating schools for pretest and posttest survey data collection, which allowed for a quasi-experimental intervention study within each school. Participants were not randomly assigned to groups, but were assessed in intact classroom groups, with approximately half the classes at each school comprising the intervention group, and the other half comprising the "wait-list control group." The use of CIS in both schools is a naturalistic intervention, such that I did not modify how instructors normally utilize CIS. Rather, I conducted outcome measurements before and after the use of the pre-existing CIS curriculum for both treatment and control groups. The two schools used distinct modules of CIS (i.e. Interest profiler at School A, and Interest Profiler, IDEAS, SKILLS, Reality Check, and Work Importance Locator at School B). Given the differences in the utilization of CIS between the two high schools, separate sections are dedicated to School A and School B, and the data was analyzed separately.

A quasi-experimental between-groups comparison design was utilized at School A to investigate the effectiveness of the CIS on high school student's vocational skills self-efficacy, outcome expectations, work hope, career planning, career decision making difficulties, and postsecondary plans. Self-reported race/ethnicity and socio-demographic

indicators (i.e. free and reduced lunch status, parent education level) were also examined to explore the effectiveness of CIS across sociocultural identities. The independent variable in this study was categorical with two levels: 1) high school career development curriculum with CIS, and 2) a "wait-list control group." The continuous dependent variables in this study were derived from the previously described career related variables.

A quasi-experimental between-groups waitlist control comparison design was also utilized at School B to investigate the effectiveness of the CIS on high school student's vocational skills self-efficacy, outcome expectations, work hope, career planning, career decision making difficulties, and postsecondary plans. Self-reported gender, race/ethnicity, and SES differences among participants were also collected to assess the effectiveness of CIS across sociocultural identities. The independent variable in this study was categorical with two levels: 1) high school career development curriculum with CIS, and 2) a "wait-list control group." The quantitative dependent variables in this study included the previously described measures.

Participants

Participants for this study included 759 first year high school students from two Oregon schools; School A and School B. Both schools were located in small cities with populations of 22,437 and 24,183 (U.S. Census Bureau, 2016). 395 of these students were at School A, while 364 of these students were at School B. A summary of participants' demographic variables and pretest postsecondary plans by school is presented in Table 1.

Table 1
Participant Demographic Information (N = 759)

	School A (*n* = 395)		School B (*n* = 364)	
	n	%	*n*	%
Race/ethnicity				
American Indian and Alaskan Native	15	3.80%	15	4.12%
Asian and Pacific Islander	14	3.54%	4	1.10%
African American and Black	10	2.53%	4	1.10%
Latino and/or Hispanic	58	14.68%	22	6.04%
White	252	63.80%	279	76.65%
Mixed Race	37	9.37%	35	9.62%
Unreported	9	2.28%	5	1.37%
Free and reduced lunch				
No	233	58.99%	196	53.85%
Yes	161	40.76%	162	44.51%
Unreported	1	0.25%	6	1.65%
Gender				
Female	183	46.33%	189	51.92%
Male	204	51.65%	162	44.51%
Other	4	1.01%	10	2.75%
Unreported	4	1.01%	3	0.82%
Prior CIS module use				
IDEAS	63	15.95%	88	24.18%
Interest Profiler	51	12.91%	76	20.88%
SKILLS	56	14.18%	68	18.68%
Work Importance Locator	34	8.61%	55	15.11%
Reality Check	92	23.29%	91	25.00%
No prior CIS use	281	71.13%	240	65.93%
Pretest postsecondary education plans				
No education plans	37	10.3%	29	8.9%
2-year community college degree	64	17.8%	65	19.9%
4-year bachelor's degree	222	61.7%	189	57.8%
Specialized training	22	6.1%	22	6.7%
Military	15	4.2%	22	6.7%
Other	0	0%	0	0%
Unreported	35	8.9%	37	10.2%

Note. "Unreported" refers to participants who did not specify an option the category. "Prior CIS module use" refers to proportion of students who reportedly utilized a CIS module one or more times before the current study.

To provide state context, the demographic makeup of the state is 76.4% White, 12.8% Latino/a or Hispanic, 2.1% Black or African American, 1.8% American Indian and Alaskan Native, 4.5% Asian, 0.4% Native Hawaiian and Other Pacific Islander, and 3.8% Multi-Racial (U.S. Census Bureau, 2016).

Among the 395 participants at School A, 203 students comprised the intervention group, while 192 students comprised the control group. Students enrolled in the first-year "health" class were in the intervention group over the course of one week during the semester in which they had the CIS intervention. The CIS intervention was delivered during their regularly scheduled class time by school counselors who facilitated the application of the CIS modules. Students not enrolled in the first-year "health" class were in the control group, as they would not be exposed to the CIS intervention until the following spring semester. Of the 364 students at School B, 212 students comprised the intervention group, while 152 students comprised the control group. Students enrolled in the first-year "house" class were in the intervention group over the course of one week during the semester in which they had the CIS intervention. The CIS intervention was delivered during their regularly scheduled class time by teachers who facilitated the application of the CIS modules. Students not enrolled in the first-year "house" class were in the control group, as they would not be exposed to the CIS intervention until the spring semester.

Intervention

The interventions in both studies included CIS career assessment modules that match assessments of career-related characteristics with relevant occupational information. Users were provided with a profile of their career assessment results as well

as corresponding occupation information and access to information about these occupations (salary, education requirements, working conditions, predicted growth or decline of this occupation in Oregon, etc.). Interest inventories matched interests to possible occupations, work values assessments matched work values to occupations, and skills assessments matched users' skills with the skills they wanted to use to occupations that include those skills. School A and School B utilize distinct CIS assessment modules. School A utilized one assessment module within CIS, while School B utilized all available assessment modules within CIS (see Table 2).

Table 2. List of CIS Activities, CIP Domains, and School Use

CIS Activity	Aims	CIP Domain	School A Use	School B Use
IDEAS	Identify specific clusters of occupations that fit interests	Self-knowledge		X
Interest Profiler	Identify specific occupations that fit interests	Self-knowledge	X	X
SKILLS	Identify transferrable skills that are enjoyable when accomplishing goals, and match them to occupations	Self-knowledge		X
Work Importance Locator	Learn about work values, identify personal values, and match them to occupations	Self-knowledge		X
Reality Check	Identify desired lifestyle and match them to occupations	Self-knowledge		X
Occupation Information	Current employment openings, average wages, future occupational outlooks, common hiring practices, licensing, as well as necessary skills, abilities, and knowledge for each particular occupation	Options-knowledge	X	X
Programs of Study	Information about postsecondary programs of study and training in the state including admission requirements, tuition costs, scholarship and financial aid opportunities	Options-knowledge	X	X

Career Plan Activity	Students select occupations based on their self-assessment results and corresponding list of occupations	Decision-Making Skills (CASVE Cycle)	X	X
Reflective Prompts	Students write a reflection upon completing each activity	Metacognition	X	X

Note. CIP Domain = Career Information Processing Theory Domain. CASVE Cycle = Communication, Analysis, Synthesis, Valuing, and Execution.

Measures

The following items and measures were administered at both schools before and after the administration of CIS intervention. A summary of the measures utilized is presented in Table 3.

Demographics. Participant self-reported demographic data were collected at pretest to determine gender, race/ethnicity, SES, grade point average (GPA), and postsecondary plans (See Appendix A). Race/Ethnicity was determined by a checklist in which participants could identify one or more ethnicities, and SES was determined by participants' report of parent(s) education and if they receive free or reduced lunch. Parental education levels were assessed by asking respondents to check the highest level of education each parent or guardian had received, with response options consisting of "Some high school" (1 point), "Finished high school" (2 points), "some trade school" (3 points), "Finished trade school" (4 points), "Some college" (5 points), "Finished college" (6 points), "Some graduate school" (7 points), and "Finished graduate degree" (8 points). Grades were assessed using the prompt, "What are your grades, in general? (Circle one)." Response options included: A's, B's, C's, D's, F's. Work and educational plans were assessed using the prompt, "What are your PLANS immediately after high school? (Check all that apply)." Response options included: work full-time; work part-time; not planning to work; enroll in 2 year/community; enroll in 4 year/bachelor; enroll in

specialized training, college program degree program or apprenticeship program (carpentry, beautician); enter military; other (please describe).

Prior Use of CIS. Participants were asked if they have used CIS in the past and were prompted to list which of the CIS modules they already used as well as how many times they have used those modules. A summary of Prior Use of CIS was presented in Table 3. These items were included in the initial demographic questionnaire and after completion of the intervention to identify any prior use of CIS among participants (See Appendix A). Prior use of CIS did not differ in regards to treatment group and control groups in School A and School B.

Occupations of Interest. Participants were asked to identify two occupations that they currently were most interested in pursuing. This question was asked at both data-collection time points. Participants were asked to fill in two blank spaces with their preferred occupations (See Appendix A). From their occupational responses, I created a variable which identifies changes in occupational goals. Pretest and posttest occupation responses were compared and coded to demonstrated changes in posttest occupation goals. No change (coded as "0") indicated that participants maintained the same occupations at pretest and posttest test. One occupational change (coded as "1") indicated that participants identified one new occupation of interest and kept one of the same occupations from pretest. Two occupational changes (coded as "2") indicated that participants identified two new occupations of interest at posttest.

Vocational Skills Self-Efficacy. Vocational skills self-efficacy was assessed using a subset of items from the original 37-item self-report measure (VSSE: McWhirter, Rasheed, and Crothers, 2000) (See Appendix B). The VSSE is designed to measure

respondents' confidence in their ability to carry out developmentally appropriate career-related tasks. The tasks assessed with VSSE items were derived from high school guidance curricula. Respondents rate on a scale from 0 (no confidence at all) to 9 (complete confidence) how they feel they can do such this as "find out the education requirements for a job" or "set and achieve short-term and long-term goals." Test-retest reliability for a 9-week time period was established for this measure with a sample of high 95 high school students and yielded a coefficient of .68 (McWhirter et al., 2000). Convergent validity for this measure was established by correlating it with the Career Decision-Making Self-Efficacy Scale (CDMSE; Betz & Taylor, 1994). Fowkes (2007) removed items from the original VSSE that were outside of the scope of the participants' age in a similar CACGS intervention (e.g. confidence that one could "Complete a job application correctly"). The modified 18-item questionnaire was used for this study. Internal consistency reliability coefficient for the 18-item measure were .93 for a sample of high school 85 sophomores and 134 seniors in the state of OR (Fowkes, 2007). For the present sample, the reliability coefficient for the VSSE at pretest was $\alpha = .92$ for School A and $\alpha = .91$ for School B.

Vocational Outcome Expectations. Participants' career outcome expectations were measured using the 12-item Vocational Outcome Expectations (VOE-R) scale (McWhirter & Metheny, 2009; Metheny & McWhirter, 2013). The original 6-item VOE was constructed by Ellen Hawley McWhirter (1997) (See Appendix C). Sample items included, "My career planning will lead to a satisfying career for me" and "I will be successful in my chosen career/occupation." Responses included four options ranging from "strongly agree" to "strongly disagree." Responses were averaged for a composite

score ranging between 0 and 5, with higher scores indicating more positive outcome expectations. In a 2000 study, McWhirter and colleagues determined the test-retest reliability over a 9-week quarter yielded a coefficient of $r = .59$ from a sample of 81 high school students. The Cronbach's alpha for the main sample was .83. Gushue (2005) utilized the (VOE) measure with a sample of 128 Latina/o freshman high school students and demonstrated a Cronbach's alpha of .72. The VOE was revised by Metheny and McWhirter in 2013 by the addition of 6 items and demonstrated an α of .93 for a sample of college students. For the present sample, the reliability coefficient for VOE-R at pretest was $\alpha = .91$ for School A and $\alpha = .85$ for School B.

Work Hope. The Work Hope Scale (WHS: Juntunen & Wetterson, 2006) was administered to assess participants' goals (e.g., "I have goals related to work that are meaningful to me"), pathways (e.g., "I have a plan for getting or maintaining a good job or career"), and agency (e.g., "I am confident that things will work out for me in the future") (See Appendix E). The scale includes 24 items, each corresponding to work pathways, goals, or agency (i.e. work hope). Juntunen and Wettersten (2006) report a Cronbach's α of .93 for the total scale among a diverse sample of adolescents and young adults. Confirmatory factor analysis (CFA) demonstrated that the WHS would be best used as a single composite scale rather than three subscales derived from hope theory (i.e. agency, pathways, and goals). Juntunen and Wettersten (2006) found the WHS was positively associated with career self-efficacy ($r = .62$) for a sample varied in terms of age, education, employment status, and ethnicity. For the present sample, the reliability coefficient for WH at pretest was $\alpha = .92$ for School A and $\alpha = .93$ for School B.

Career Planning. Career planning will be assessed using the Career Planning (CP) subscale of the Career Development Inventory (CDI: Thompson et al., 1981) (See Appendix F). The CP subscale includes 20 items, which represent the degree of engagement in developing career plans. Sample items will include, "I have or am planning to talk about career plans with an adult who knows something about me" and “I plan to get the kind of training, education, or experience I will need to get the kind of work I would like.” Responses include five options ranging from “strongly agree” to “strongly disagree.” (Leveinson et al., 1998; Thompson, Lindeman, Super, Jordaan, & Myers, 1981). Pinkney and Bozik (1994) reported an internal reliability coefficient for the CP subscale of .89. For the present sample, the reliability coefficient for CP at pretest was $\alpha = .92$ for School A and $\alpha = .91$ for School B.

Career Decision-Making Difficulties. Career decision-making difficulties were assessed using the Career Decision-Making Difficulties Questionnaire adapted for high school students (CDDQ: Gati et al., 1996) (See Appendix D). The adapted questionnaire includes 34 items, each corresponding to a particular difficulty (e.g., “It is usually difficult for me to make a decision”). The questionnaire assesses difficulties in three broad categories, each of which forms a subscale: Lack of Readiness (10 items), Lack of Information (12 items), and Inconsistent Information (10 items). The Lack of Readiness subscale includes items assessing lack of motivation, general indecisiveness, and dysfunctional beliefs regarding the career decision-making process. The Lack of Information subscale includes items assessing lack of knowledge or information about the career decision-making process, self, various occupations, and obtaining additional information. The Inconsistent Information subscale includes items assessing unreliable

information, internal conflicts, and external conflicts. Participants are asked to rate the degree to which each statement described them on a 9-point scale (1 = does not describe me at all to 9 = describes me well). The Cronbach's alpha for the total CDDQ scale was .91 with a sample of 1,772 Israeli high school students (Gati & Saka, 2001). The reliability coefficients for the three CDDQ subcategories were as follows: Lack of Readiness (α = .62), Lack of Information (α = .88), and Inconsistent Information (α = .87). For the present sample at School A, the reliability coefficient for CDDQ total at pretest was α = .95. The reliability coefficients for the three CDDQ subcategories in School A at pretest were as follows: Lack of Readiness (α = .77), Lack of Information (α = .96), and Inconsistent Information (α = .94). For the present sample at School B, the reliability coefficient for CDDQ total at pretest was α = .96. The reliability coefficients for the CDDQ subcategories in School B at pretest were as follows: Lack of Readiness (α = .76), Lack of Information (α = .96), and Inconsistent Information (α = .94).

Table 3
List of Constructs, Measures, and Data-Collection Points (School A & School B)

Construct	Measures
Demographics	Demographic questionnaire: sex, race/ethnicity, SES, GPA, postsecondary plans
Occupations of interest	Identify two occupations that they currently are most interested in pursuing
Vocational skills self-efficacy	Vocational Skills Self-Efficacy Scale, 18-item short form. (VSSE; McWhirter, Rasheed, & Crothers, 2000)
Career outcome expectations	Outcome Expectations subscale: 6-items. (OE: McWhirter, Rasheed, and Crothers, 2000)
Decision-making difficulties	Career Decision-Making Difficulties Questionnaire: 34 items. (CDDQ; Gati, Saka, & Krausz, 2001). Three subscales: Lack of Readiness, Lack of Information, and Inconsistent Information
Work Hope	Work Hope Scale: 24-items. (WHS: Juntunen & Wetterson, 2006)

Career Planning	Career Planning subscale: 20-items. (CP: Thompson et al., 1981)
CIS use	Items assess prior use of CIS modules and likelihood of independently using CIS modules again

Note. The complete survey utilized at pretest and posttest is presented in Appendices A-G.

Procedures: School A

The CIS intervention was administered over the course of one week during a health class that is required for all first-year students. School A students enrolled in the "health" class completed the Interest Profiler over the course of one week during the semester in which they had this class. Half of all first-year students were registered by the school to complete the health course in the fall, while the other half take it during the spring term. The majority of students were registered in the health course either during fall or spring term at random, while some students were registered for the course in a certain semester based on other courses or extra-curricular activities. Career center counselors at School A administered the CIS curriculum during one week of the freshmen health course midway through the fall semester. Participants utilized school computers to access CIS modules while career counselors provided instructions. Career counselors presented an overview of the various functions of CIS to participants, including instructions on how to utilize a specific self-assessment module (i.e. Interest Profiler) as well as occupational and educational information modules. Upon completing the Interest Profiler self-assessment module, participants would receive a list of occupations that match their identified interests. Participants were then instructed to gather occupational and educational information (e.g. education and licensure requirements, expected salary) pertaining to occupations generated from the Interest Profiler module. First-year students in the fall semester "health" class receiving the CIS

intervention served as the treatment group and those not enrolled in the fall "health" class were the control group. Waitlist control group participants completed elective courses. Control group participants were assessed in their regularly scheduled English classes, while treatment group participants were assessed in their regularly scheduled health classes. Data collection for both the intervention group and waitlist control group occurred over two time points: 1) two weeks prior to the CIS intervention, and 2) two weeks following the CIS intervention (see Table 4). Thus, there were 4 weeks between the pretest and the posttest.

Table 4
Intervention and Data Collection Time Points at School A (N = 395)

	Fall academic term		
Treatment group	Time 1	Intervention	Time 2
Treatment (*n* = 203)	Pretest	CIS use	Posttest
Waitlist Control (*n* = 192)	Pretest	No CIS use	Posttest

Note. No CIS Use = Elective Course Instruction.

Procedures: School B

Approximately half of all first-year students were enrolled in what that school refers to as the first-year "house" class in the fall semester and the remaining half of first-year enrolled in the first-year "house" class in the spring semester. The first-year "house" class is a required class for all first-year students which covers topics related to education planning and developing study skills. School B students enrolled in the first-year "house" class completed the CIS curriculum over the course of one week during the semester in which they have this class. First-year "house" class teachers provided instructions to participants as they utilized the CIS program on school computers. Teachers provided an overview of the various functions of CIS to participants, including instructions on how to

utilize multiple self-assessment modules (i.e. Interest Profiler, IDEAS, SKILLS, Reality Check, and Work Importance Locator) as well as occupational and educational information modules. Upon completing each self-assessment module, participants would receive computer-generated information, including lists of occupations that match their identified characteristics (e.g. interests, values, skills, and lifestyle preferences). Participants were then instructed by teachers to gather occupational and educational information (e.g. education and licensure requirements, expected salary, etc.) for their most preferred occupations generated in the various self-assessments. School B students who were in the same grade level, but were not taking the class and had not been exposed to the intervention served as the waitlist control group. Waitlist control group participants completed elective courses (e.g. ceramics, photography, video production, acting, dancing, and music). The waitlist control group then took the class in the spring semester with the CIS intervention. Data collection for both the fall term first-year classes occurred over two time points: 1) two weeks prior to the fall term intervention, and 2) two weeks following the fall term intervention (see Table 5). Thus, there were four weeks between the pretest and the posttest for both intervention and control groups. Both treatment and control group participants were assessed in the context of their regularly scheduled physical education classes.

Table 5
Intervention and Data Collection Time Points at School B (N = 364)

	Fall academic term		
Group	Time 1	Intervention	Time 2
Treatment (*n* = 212)	Pretest	CIS Use	Posttest
Waitlist Control (*n* =152)	Pretest	No CIS Use	Posttest

Note. No CIS Use = Elective Course Instruction.

CHAPTER III

RESULTS

Because each of the two sites included in this study implement CIS differently, the results are presented in a School A and School B format. The proposed hypotheses were identical for both School A and School B. Both results sections are organized with the following structure: preliminary analyses, descriptive data, and the main analyses of hypothesis testing. A summary table of the hypotheses for both School A and School B are presented in the end of the results section. All analyses were performed using SPSS version 23.0 (SPSS, 2017).

Preliminary Analyses: School A

School A data was initially screened for outliers, skew, and kurtosis, and was examined for patterns of missing data (Tabachnick & Fidell, 2012). Data from 14 respondents were excluded from the analyses due to incomplete surveys or responses across measures that appeared to be answered disingenuously. Data screening demonstrated one univariate outlier on the measure of Vocational Outcome Expectations. Examination of the raw data for the Vocational Outcome Expectations outlier revealed the outlying score was within the acceptable range of scores and that it appeared to be a genuine response. As such, the outlier was retained in the data analysis.

Skewness and kurtosis was examined for each variable in this study, and responses on each measure were within an acceptable range. Scores for the variables of VSSE, VOE, WH, CP, and CDDQ subscales were all relatively within the recommended range of -1 to 1 for skew and kurtosis (Tabachnick & Fidell, 2012). Data from Vocational Outcome Expectations were slightly negatively skewed at pretest (-1.04) and posttest (-

1.07), but statistics such as multivariate analyses of variance were selected to test the hypotheses, given that they are robust to such moderate violations of normality (Tabachnick & Fidell, 2012). Data for each of the other dependent variables at pretest and posttest were normally distributed.

Mean scale scores for the seven measures (i.e. VSSE, VOE, WH, CP, and CDDQ subscales) were created based on item level data, with means calculated when less than 10% of the item responses are missing, as recommended by Bennett (2001). Of the 395 responses, the amount of missing mean scale scores (i.e. more than 10% of item responses missing) for the eight measures ranged from 0% to 14.18% for pretest measures and ranged from 0% to 20.25% for posttest measures (see Table 6).

Table 6
Means, Standard Deviations, and Percent of Missing Outcome Variables (N=395)

	Non-imputed				Imputed		
Variable	Percent Missing	*n*	Mean	SD	*n*	Mean	SD
Pretest							
VSSE	9.87%	356	3.63	0.71	395	3.62	0.71
VOE	10.63%	353	3.43	0.48	395	3.42	0.48
WH	11.39%	350	5.22	0.91	395	5.21	0.89
CP	10.63%	353	3.09	0.54	395	3.07	0.53
$CDDQ_T$	12.66%	345	4.11	1.50	395	4.16	1.44
$CDDQ_1$	12.66%	345	4.50	1.36	395	4.54	1.33
$CDDQ_2$	13.42%	342	4.13	1.93	395	4.21	1.89
$CDDQ_3$	14.18%	339	3.68	1.86	395	3.73	1.80
Posttest							
VSSE	13.92%	340	3.68	0.76	395	3.70	0.75
VOE	14.68%	337	3.37	0.57	395	3.34	0.56
WH	16.96%	328	5.17	0.89	395	5.14	0.90
CP	17.22%	327	3.10	0.54	395	3.10	0.51
$CDDQ_T$	18.23%	323	4.11	1.67	395	4.14	1.54
$CDDQ_1$	18.23%	323	4.58	1.56	395	4.60	1.49
$CDDQ_2$	20.76%	313	3.99	2.00	395	4.01	1.90
$CDDQ_3$	20.25%	315	3.74	2.00	395	3.80	1.93

Note. VSSE = Vocational Skills Self-Efficacy (possible score range, 1-5); VOE = Vocational Outcome Expectations (possible score range 1-4); WH = Work Hope (possible score range 1-7); Career Planning (possible score range 1-4); $CDDQ_T$= Career Decision-Making Difficulties Questionnaire total (possible score range 1-9); $CDDQ_1$= CDDQ "lack of readiness" subscale (possible score range 1-9); $CDDQ_2$= CDDQ "lack of information" subscale (possible score range 1-9); $CDDQ_3$= CDDQ "inconsistent information" subscale (possible score range 1-9).

The missing at random (MAR) assumption was not tenable ($\chi 2[1709] = 1850.2$, $p = .009$) as per Little's MCAR test. (Little & Rubin, 1987). Chi-square tests of independence with indicator variables created to denote missingness at pretest and missingness at posttest were utilized to compare missingness by gender, race/ethnicity, SES, and treatment group (i.e. CIS treatment and control group). At pretest, there were no differences in missingness as a function of gender, race/ethnicity, or treatment group. The relationship between SES and missingness at pretest measures was significant $\chi 2$ (2, N=389) = 12.66, $p < .01$. Students receiving free and reduced lunch were less likely to complete measures at pretest. At posttest, there were no differences in missingness as a function of gender, race/ethnicity, or treatment group. The relationship between SES and missingness at posttest measures was also significant $\chi 2$ (2, N=389) = 8.54, $p < .01$. Students receiving free and reduced lunch were less likely to complete measures at posttest. We used imputation with the Expectation Maximization (EM) algorithm to address missing scale values with the exception of missing data for demographic variables (Dempster, Laird, & Rubin, 1977). For each analysis, we compared the findings with and without imputed values as a final test of the influence of missing data. Results did not differ significantly based on imputed values. All of the following results are based on imputed values.

A chi-square (χ^2) test of independence was also used to examine differences in prior use of CIS between treatment and control group participants. Chi-square analysis

examines the relationship between two discrete variables by generating expected frequencies and comparing them against observed frequencies among the two variables (Tabachnick & Fidell, 2012). The chi-square test of independence comparing prior use of CIS in treatment and control participants was non-significant (χ^2 (2) = 1.446, p = .229) in School A. Prior use of CIS did not differ in regards to treatment group and control groups in School A.

Descriptive Data: School A

Descriptive data for School A were examined prior to hypothesis testing. Table 7 includes means, standard deviations for outcome variables across treatment group, gender, race/ethnicity, and free and reduced lunch. White and Asian students in the state of Oregon demonstrate higher graduation rates and higher achievement in math and reading compared to all other ethnic groups (Oregon Department of Education, 2016). As such, results regarding ethnicity are compared between "White and Asian" and "other ethnic groups." Table 8 shows the correlation matrix for the dependent variables VSSE, VOE, WH, CP, and CDDQ subscales at pretest.

Table 7
Grand Means and Standard Deviations for Outcome Variables at Pretest (N=395)

Variable		VSSE	VOE	WH	CP	$CDDQ_1$	$CDDQ_1$	$CDDQ_2$	$CDDQ_3$
CIS Treatment	Mean	3.73	3.45	5.13	3.13	3.97	4.47	4.03	3.41
	SD	0.67	0.45	0.88	0.51	1.47	1.37	1.97	1.77
	n	203	203	203	203	203	203	203	203
Control	Mean	3.51	3.39	5.08	3.02	4.37	4.62	4.4	4.08
	SD	0.74	0.5	0.89	0.55	1.39	1.29	1.79	1.77
	n	192	192	192	192	192	192	192	192
Female	Mean	3.74	3.5	5.37	3.15	3.88	4.34	3.89	3.4
	SD	0.69	0.44	0.89	0.52	1.42	1.27	1.9	1.74
	n	165	165	165	165	165	165	165	165

Male	Mean	3.56	3.38	5.11	3.05	4.35	4.69	4.43	3.93
	SD	0.69	0.5	0.9	0.54	1.5	1.39	1.92	1.86
	n	191	191	191	191	191	191	191	191
White/Asian	Mean	3.62	3.44	5.23	3.06	4.16	4.47	4.27	3.74
	SD	0.69	0.46	0.88	0.55	1.46	1.32	1.94	1.79
	n	214	214	214	214	214	214	214	214
All other race/ethnicity	Mean	3.65	3.42	5.24	3.14	4.09	4.62	4.02	3.63
	SD	0.73	0.5	0.93	0.51	1.51	1.38	1.89	1.89
	n	145	145	145	145	145	145	145	145
No free and lunch	Mean	3.52	3.35	5.04	3.00	4.35	4.72	4.37	3.96
	SD	0.78	0.5	0.86	0.55	1.32	1.27	1.78	1.73
	n	162	162	162	162	162	162	162	162
Free and reduced lunch	Mean	3.69	3.47	5.32	3.12	4.03	4.42	4.1	3.58
	SD	0.66	0.46	0.89	0.51	1.51	1.35	1.95	1.83
	n	233	233	233	233	233	233	233	233

Note. VSSE = Vocational Skills Self-Efficacy (possible score range, 1-5); VOE = Vocational Outcome Expectations (possible score range 1-4); WH = Work Hope (possible score range 1-7); Career Planning (possible score range 1-4); $CDDQ_T$= Career Decision-Making Difficulties Questionnaire total (possible score range 1-9); $CDDQ_1$= CDDQ "lack of readiness" subscale (possible score range 1-9); $CDDQ_2$= CDDQ "lack of information" subscale (possible score range 1-9); $CDDQ_3$= CDDQ "inconsistent information" subscale (possible score range 1-9).

Table 8

Correlations between Outcome Variables at Pretest (N = 395)

Variable	1	2	3	4	5	6	7	8
1. VSSE	-							
2. VOE	.62	-						
3. WH	.61	.75	-					
4. CP	.71	.59	.60	-				
5. $CDDQ_T$	-.31	-.32	-.52	-.27	-			
6. $CDDQ_1$	-.16	-.16	-.28	-.10	.73	-		
7. $CDDQ_2$	-.37	-.36	-.52	-.34	.91	.48	-	
8. $CDDQ_3$	-.25	-.29	-.49	-.23	.92	.52	.78	-

Note. All correlations are statistically significant at $p < .001$. VSSE = Vocational Skills Self-Efficacy. VOE = Vocational Outcome Expectations. WH = Work Hope. CP = Career Planning. $CDDQ_T$= Career Decision-Making Difficulties Questionnaire total score. $CDDQ_1$= CDDQ "lack of readiness" subscale. $CDDQ_2$= CDDQ "lack of information" subscale. $CDDQ_3$= CDDQ "inconsistent information" subscale.

Main Analyses: School A

Hypothesis 1 (School A): Exposure to CIS treatment will be associated with increases in students' vocational skills self-efficacy, outcome expectations, work hope, and career planning, and decreases in career decision-making difficulties.

Two multivariate analysis of covariance (MANCOVA) analyses were conducted to compare treatment group posttest differences in vocational skills self-efficacy, outcome expectations, work hope, and career planning, and career decision-making difficulties while controlling for pretest differences. In the 1st MANCOVA, VSSE, VOE, WH, and CP scales served as dependent variables, whereas in the 2nd MANCOVA, the CDDQ subscales served as dependent variables. MANCOVA was selected to test this hypothesis, given that MANCOVA can address chance differences among groups that occur in a non-random assignment to treatment condition, by accounting for pretest scores as covariates of the dependent variables (Tabachnick & Fidell, 2012). Additionally, MANCOVA offers greater chances of identifying which specific changes occur among different measures, given that multiple dependent variables are assessed simultaneously (Tabachnick & Fidell, 2012). This rational for using MANCOVA was applied to the analyses in hypothesis 1, hypothesis 2, and hypothesis 3. Effect sizes for MANCOVA results are described using the following guidelines: small (η^2 = .01), medium (η^2 =.09), and large (η^2 =.25) (Cohen, 1988; Tabachnick & Fidell, 2012).

The first MANCOVA was conducted to compare group (i.e. treatment vs. control) posttest differences in VSSE, VOE, WH, and CP, while controlling for pretest differences. Treatment group was the independent variable and VSSE, VOE, WH, and CP posttest scores were dependent variables, while pretest variables served as covariates. Results of the MANCOVA are presented in Table 9. The Box's Test of Equality of

Covariance Matrices checks the assumption of homogeneity of covariance across the groups using $p < .001$ as a criterion (Tabachnick & Fidell, 2012). Since robustness could not be assumed [F (10, 733201) = 9.536, $p < .001$], the more robust MANCOVA test statistic, Pillai's Trace, was used to interpret the MANCOVA results.

MANCOVA results indicated significant main effects for treatment group, Pillai's Trace = .032, $F(4,389) = 3.311$, $p = .011$, partial $\eta^2 = .033$. One root of the multivariate solution was statistically significant, accounting for 3.3% of the variance explained by the model. Examination of associated standardized discriminant function coefficients (*SDFC*) used to weight the multivariate composite revealed that work hope (*SDFC* = -0.71) and vocational outcome expectations (*SDFC* = -0.41) were most important in forming the function that discriminated treatment and control group. Vocational skills self-efficacy *(SDFC* = -0.29) and career planning *(SDFC* = 0.13) contributed less to the function. Inspection of the structure coefficients indicated that the observed measures had moderate to strong correlations with the multivariate composite. Work hope (r = -0.87) and vocational outcome expectations (r = -0.71) demonstrated higher correlations with the function that discriminated the treatment and control group. Vocational skills self-efficacy and career planning demonstrated moderate correlations, (r = -0.47) and (r = -0.38), respectively.

Next I examined univariate F tests. The alpha was adjusted for the multiple group mean tests on each DV (i.e., .05/4 = .0125) to maintain the probability of type I error at .05. The univariate F tests demonstrated significant differences between CIS treatment and control for work hope $F(1, 392) = 10.176$, $p = .002$, partial $\eta^2 = .025$, and vocational outcome expectations $F(1, 392) = 6.653$, $p = .010$, partial $\eta^2 = .017$. The effect size for

both work hope and vocational outcome expectations is small. The *F* tests were not significant for vocational skills self-efficacy $F(1, 392) = 2.939$, $p = .087$, partial $\eta^2 = .007$ or career planning $F(1, 392) = 1.947$, $p = 0.164$., partial $\eta^2 = .005$. A summary of MANCOVA results is presented in Table 9.

Table 9
Multivariate Analysis of Covariance for Treatment Controlling for Pretest Variables (N=395)

Posttest Variable	CIS Treatment			Control					
	n	*M*	*SD*	*n*	*M*	*SD*	*F*(1,389)	*p*	η_p^2
VSSE	203	3.82	.66	192	3.58	.82	2.939	.087	.007
VOE	203	3.44	.41	192	3.24	.66	6.653	.010*	.017
WH	203	5.32	.84	192	4.94	.92	10.176	.002*	.025
CP	203	3.17	.46	192	3.02	.55	1.947	.164	.005

Note. $*p < 0.0125$. VSSE = Vocational Skills Self-Efficacy. VOE = Vocational Outcome Expectations. WH = Work Hope. CP = Career Planning.

The second MANCOVA was conducted to compare treatment group (i.e. treatment vs. control) posttest differences in the three CDDQ subscales, including the "lack of readiness" subscale, "lack of information" subscale, and the "inconsistent information" subscale, while controlling for pretest differences. Treatment group was the independent variable and the three CDDQ subscales were dependent variables, while pretest CDDQ subscales were treated as covariates. Results of the MANCOVA are presented in Table 10.

Box's M Test was non-significant, indicating equality of variances, $F(6, 1109697) = 2.315$, $p = .031$. MANCOVA results revealed significant differences between the CIS intervention and control group on the outcome variables, Wilks' $\Lambda = .924$, $F(3,390) = 11.790$, $p < .001$, partial $\eta^2 = .083$. One root of the multivariate solution was statistically significant, accounting for 8.3% of the variance explained by the model.

Examination of associated standardized discriminant function coefficients (*SDFC*) used to weight the multivariate composite revealed that the "inconsistent information" subscale (*SDFC* = 1.01) was the most important in forming the function that discriminated treatment and control group. The "lack of information" subscale (*SDFC* = .07) and the "lack of readiness" subscale (*SDFC* -0.16) contributed less to the function. Inspection of the structure coefficients indicated that the observed measures had moderate to strong correlations with the multivariate composite. The "inconsistent information" subscale (r = 0.98) was highly correlated with the function that discriminated the treatment and control group. The "lack of information" subscale had a moderate correlation (r = 0.68) and the "lack of readiness" subscale (r = 0.30) had the lowest correlation.

The univariate F tests demonstrated significant differences between CIS treatment and control for the "inconsistent information" subscale $F(1, 392) = 34.784$, $p < .001$, partial $\eta^2 = .082$, and the "lack of information" subscale $F(1, 392) = 16.272$, $p < .001$, partial $\eta^2 = .040$. The F test was not significant for the "lack of readiness" subscale $F(1, 392) = 3.168$, $p = .076$, partial $\eta^2 = .008$. The alpha was adjusted for the multiple group mean tests on each DV (i.e., .05/3 = .017) to maintain the probability of type I error at .05. Both "lack of information" and "inconsistent information" were significantly lower for CIS treatment participants. The effect size for "lack of information" was small, while the effect size for "inconsistent information" was medium. A summary of MANCOVA results is presented in Table 10.

Table 10
Multivariate Analysis of Covariance for Treatment Controlling for Pretest Variables (N=395)

Posttest Variable	CIS Treatment			Control					
	n	*M*	*SD*	*n*	*M*	*SD*	*F*(1,392)	*p*	η_p^2
$CDDQ_1$	203	4.39	1.37	192	4.82	1.57	3.168	.076	.008
$CDDQ_2$	203	3.57	1.78	192	4.48	1.93	16.272	<.001*	.040
$CDDQ_3$	203	3.21	1.63	192	4.42	2.03	34.784	<.001*	.082

Note. *$p < 0.017$. $CDDQ_1$= CDDQ "lack of readiness" subscale. $CDDQ_2$= CDDQ "lack of information" subscale. $CDDQ_3$= CDDQ "inconsistent information" subscale.

Overall, participants in the treatment group demonstrated higher work hope and vocational outcome expectations at posttest when controlling for pretest variables. Additionally, treatment group participants demonstrated lower career decision-making difficulties (i.e. lack of information and inconsistent information) compared to their counterparts in the control condition when controlling for pretest difference.

Hypothesis 2 (School A): The effects of CIS vary as a function of participant race/ethnicity.

A series of two-way multivariate analysis of covariance (MANCOVA) analyses were conducted to examine any potential interaction between treatment group and race/ethnicity (i.e. White and Asian compared to all other race/ethnicity) on outcome variables, while controlling for pretest differences. Again, analyses were conducted separately for the VSSE, VOE, WH, and CP scales, and the CDDQ subscales.

The first MANCOVA was conducted to compare treatment group and race/ethnicity across VSSE, VOE, WH, and CP at posttest, while controlling for pretest differences. Treatment group and race/ethnicity were the two independent variables, and posttest VSSE, VOE, WH, and CP scores were the dependent variables. Pretest VSSE, VOE, WH, and CP scores were treated as covariates. The Box's M Test of Equality of

Covariance Matrices was significant $F(30, 329122) = 3.698$, $p < .001$. Since robustness could not be assumed, the more robust MANCOVA test statistic Pillai's Trace was used to interpret the MANCOVA results.

MANCOVA results demonstrated no significant interaction between treatment group and race/ethnicity, Pillai's Trace = .010, $F(4,385) = .970$, $p = .424$, partial $\eta^2 = .010$. Consistent with hypothesis 1, MANCOVA results indicated significant differences in treatment group, Pillai's Trace = .030, $F(4,385) = 2.978$, $p = .019$, partial $\eta^2 = .030$. MANCOVA results also indicated significant differences in race/ethnicity, Pillai's Trace = .026, $F(4,385) = 2.575$, $p = .037$, partial $\eta^2 = .026$. Both treatment and race/ethnicity had one statistically significant root of the multivariate solution. The treatment root of the multivariate solution was statistically significant, accounting for 3.0% of the variance explained by the model. Examination of associated standardized discriminant function coefficients (*SDFC*) used to weight the multivariate composite revealed that work hope (*SDFC* = -0.79) was most important in forming the function that discriminated treatment and control group. Vocational outcome expectations *(*SDFC = -0.37), career planning *(SDFC* = 0.12), and vocational skills self-efficacy *(SDFC* = -0.18) contributed less to the function. Inspection of the structure coefficients indicated that the observed measures had moderate to strong correlations with the multivariate composite. Work hope ($r = -0.93$) was highly correlated with the function that discriminated the treatment and control group. Vocational outcome expectations ($r = -0.67$) demonstrated a moderate correlation, while vocational skills self-efficacy ($r = -0.35$) and career planning ($r = -0.34$) had a lower correlation to the function.

The univariate *F* tests demonstrated significant differences between CIS treatment and control for work hope $F(1, 388) = 10.280$, $p = .001$, partial $\eta^2 = .026$. The *F* tests for treatment were not significant for vocational skills self-efficacy $F(1, 388) = 1.508$, $p = 0.220$., partial $\eta^2 = .004$., vocational outcome expectations $F(1, 388) = 5.314$, $p < .022$., partial $\eta^2 = .014$., or career planning $F(1, 388) = 1.379$, $p = 0.241$, partial $\eta^2 = .002$. Work hope was significantly higher among CIS treatment participants compared to control group participants. Alpha was adjusted for the multiple group mean tests on each DV (i.e., .05/4 = .0125) to maintain the probability of type I error at .05.

Table 11
MANCOVA for Treatment Controlling for Pretest Variables (N=393)

Posttest Variable	CIS Treatment			Control					
	n	*M*	*SD*	*n*	*M*	*SD*	*F*(1,388)	*p*	η_p^2
VSSE	201	3.82	.66	192	3.63	0.76	1.508	.220	.004
VOE	201	3.45	.42	192	3.27	0.64	5.314	.022	.014
WH	201	5.37	.85	192	4.98	0.93	10.280	.001*	.026
CP	201	3.17	.47	192	3.06	0.51	1.379	.241	.004

Note. *$p < 0.0125$. VSSE = Vocational Skills Self-Efficacy. VOE = Vocational Outcome Expectations. WH = Work Hope. CP = Career Planning. Two participants were excluded from this analysis as they did not report their race/ethnicity.

The race/ethnicity root of the multivariate solution was also statistically significant, accounting for 2.5% of the variance explained by the model. Work hope (*SDFC* = -0.92) was most important in forming the function that discriminated treatment and control group. Career planning *(SDFC* = 0.68), vocational outcome expectations *(*SDFC = 0.43), and vocational skills self-efficacy *(SDFC* = -0.48) contributed less to the function. Inspection of the structure coefficients indicated that the observed measures had moderate to strong correlations with the multivariate composite. Work hope (*r* = -0.65)

was highly correlated with the multivariate composite. Career planning (r = 0.34) demonstrated a moderate correlation, while vocational outcome expectations (r = 0.22) and vocational skills self-efficacy (r = -0.15) had a lower correlation to the function.

Additionally, univariate F tests demonstrated no significant differences between race/ethnicity with the adjusted alpha (i.e., .05/4 = .0125) across the four career variables. The non-significant results of the univariate F test with the adjusted alpha are presented in Table 12.

Table 12
MANCOVA Main Effects for Race/Ethnicity Controlling for Pretest Variables (N=393)

Posttest Variable	White and Asian			All other race/ethnicity					
	n	*M*	*SD*	*n*	*M*	*SD*	*F*(1,388)	*p*	η_p^2
VSSE	232	3.72	0.70	161	3.74	0.75	0.237	.627	.001
VOE	232	3.35	0.56	161	3.38	0.51	0.503	.478	.001
WH	232	5.25	0.91	161	5.08	0.90	4.360	.037	.011
CP	232	3.09	0.48	161	3.15	0.50	1.210	.272	.003

Note. *p < 0.0125. VSSE = Vocational Skills Self-Efficacy. VOE = Vocational Outcome Expectations. WH = Work Hope. CP = Career Planning. Two participants were excluded from this analysis as they did not report their race/ethnicity.

The second MANCOVA was conducted to compare treatment group and race/ethnicity across the three CDDQ subscales, including the "lack of readiness" subscale, "lack of information" subscale, and the "inconsistent information" subscale, while controlling for pretest differences. Treatment group and race/ethnicity were the independent variables and the three CDDQ subscales were dependent variables, while pretest CDDQ subscales were treated as covariates. Treatment group and race/ethnicity were the two independent variables, and the three CDDQ subscale posttest scores were

the dependent variables. The three pretest CDDQ subscale scores were treated as covariates.

Box's M Test was non-significant, indicating equality of variances, $F(18, 414400) = 2.293$, $p = .002$. MANCOVA results demonstrated no significant interaction between treatment group and race/ethnicity, Wilks' $\Lambda = .992$, $F(3, 386) = 0.879$, $p = .370$, partial $\eta^2 = .008$. MANCOVA results also indicated no significant differences in race/ethnicity, Wilks' $\Lambda = .994$, $F(3, 386) = 0.720$, $p = .541$, partial $\eta^2 = .006$. Consistent with hypothesis 1, MANCOVA results indicated significant differences in treatment group, Wilks' $\Lambda = .920$, $F(3, 386) = 11.133$, $p < .001$, partial $\eta^2 = .080$. One root of the multivariate solution was statistically significant for treatment group, accounting for 8.0% of the variance explained by the model. Examination of associated standardized discriminant function coefficients (SDFC) used to weight the multivariate composite revealed that the "inconsistent information" subscale (*SDFC* = -0.95) was the most important in forming the function that discriminated treatment and control group. The "lack of information" subscale (*SDFC* = -0.17) and the "lack of readiness" subscale (*SDFC* = 0.19) contributed less to the function. Inspection of the structure coefficients indicated that the observed measures had moderate to strong correlations with the multivariate composite. The "inconsistent information" subscale ($r = -0.98$) was highly correlated with the function that discriminated treatment and control group. The "lack of information" subscale had a moderate correlation to ($r = -0.73$), while the "lack of readiness" subscale ($r = -0.28$) had the lowest correlation.

The univariate *F* tests demonstrated significant differences between CIS treatment and control for the "lack of information" subscale $F(1, 388) = 17.681$, $p < .001$, partial η^2

= .044, and the "inconsistent information" subscale $F(1, 388) = 32.236$, $p < .001$, partial $\eta^2 = .077$. The F test was not significant for the "lack of readiness" subscale $F(1, 388) = 2.686$, $p = .102$, partial $\eta^2 = .007$. The alpha was adjusted for the multiple group mean tests on each DV (i.e., .05/3 = .017) to maintain the probability of type I error at .05. Both "lack of information" and "inconsistent information" were significantly lower for CIS treatment compared to the control group.

Table 13
MANCOVA Main Effects for Race/Ethnicity Controlling for Pretest Variables (N=393)

Posttest Variable	CIS Treatment			Control					
	n	*M*	*SD*	*n*	*M*	*SD*	*F*(1,388)	*p*	η_p^2
$CDDQ_1$	201	4.40	1.34	192	4.86	1.54	2.686	.102	.007
$CDDQ_2$	201	3.57	1.79	192	4.54	1.91	17.681	<.001*	.044
$CDDQ_3$	201	3.20	1.65	192	4.45	2.03	32.236	<.001*	.077

Note. *$p < 0.017$. $CDDQ_1$= CDDQ "lack of readiness" subscale. $CDDQ_2$= CDDQ "lack of information" subscale. $CDDQ_3$= CDDQ "inconsistent information" subscale. Two participants were excluded from this analysis as they did not report their race/ethnicity.

Overall, the interaction effect of the first MANCOVA between treatment group and race/ethnicity was not statistically significant when controlling for pretest career variables. The main effects of the MANCOVA demonstrated that work hope was significantly higher among CIS treatment participants compared to control group participants. White and Asian participants were not significantly different compared to participants from other racial/ethnic backgrounds in regards to VSSE, VOE, WH, or CP.

The interaction effect of the second MANCOVA was not statistically significant between treatment group and race/ethnicity for career decision-making difficulties variables at posttest when controlling for pretest career variables. The main effects of the MANCOVA demonstrated that "lack of information" and "inconsistent information"

were significantly lower for CIS treatment compared to the control group. White and Asian participants were not significantly different from participants of other racial/ethnic backgrounds with respect to the three career decision-making difficulties subscales at posttest.

Hypothesis 3 (School A): The effects of CIS vary as a function of SES.

A series of two-way multivariate analysis of covariance (MANCOVA) analyses were conducted to examine any potential interaction between treatment group and SES (free and reduced lunch vs. no free and reduced lunch) on outcome variables, while controlling for pretest differences. VSSE, VOE, WH, and CP scales were assessed separately from the three CDDQ subscales.

The first MANCOVA was conducted to examine any potential interaction between treatment group and SES (free and reduced lunch vs. no free and reduced lunch) on posttest differences, while controlling for pretest differences. Treatment group and SES were the two independent variables, and VSSE, VOE, WH, and CP posttest scores were the dependent variables. Pretest VSSE, VOE, WH, and CP scores were treated as covariates. The Box's M Test of Equality of Covariance Matrices could not be assumed [$F(30, 247796) = 4.013$, $p < .001$]. As such, the more robust MANCOVA test statistic, Pillai's Trace, was used to interpret the MANCOVA results.

MANCOVA results demonstrated no significant interaction between treatment group and SES, when controlling for pretest variables, Pillai's Trace = .007, $F(4, 386) = .666$, $p = .616$, partial $\eta^2 = .007$. MANCOVA results also indicated no significant differences in SES, Pillai's Trace = .008, $F(4, 386) = 0.753$, $p = .556$, partial $\eta^2 = .008$. Consistent with hypothesis 1, MANCOVA results indicated significant differences in

treatment group, Pillai's Trace = .032, $F(4, 386) = 3.213$, $p = .013$, partial $\eta^2 = .032$. SES group (i.e. free and reduced lunch vs. no free and reduced lunch participants) was not significantly different in regards to vocational skills self-efficacy, vocational outcome expectations, work hope, or career planning.

Treatment group had one statistically significant root of the multivariate solution. The treatment group root of the multivariate solution was statistically significant, accounting for 3.2% of the variance explained by the model. Examination of associated standardized discriminant function coefficients (*SDFC*) used to weight the multivariate composite revealed that the WH (*SDFC* = -0.62) was the most important in forming the function that discriminated treatment and control group. The VOE (*SDFC* -0.49) and VSSE (*SDFC* = -0.37) also contributed to the formation of the function, while CP had the least contribution to forming the function. Inspection of the structure coefficients indicated that the observed measures had strong to low correlations with the multivariate composite. The WH ($r = -0.81$) and VOE ($r = -0.75$) had the strongest correlation with the multivariate composite, while VSSE ($r = -0.51$) and CP ($r = -0.34$) had a moderate correlation with the multivariate composite.

The univariate *F* tests demonstrated significant differences between CIS treatment and control for work hope $F(1, 389) = 8.490$, $p = .004$., partial $\eta^2 = .021$. The *F* tests for treatment was also significant for vocational outcome expectations $F(1, 389) = 7.379$, $p = 0.007$., partial $\eta^2 = .019$. Both vocational skills self-efficacy and career planning were not statistically significant, $F(1, 89) = 3.425$, $p < .0065$, partial $\eta^2 = .009$, and $F(1, 389) = 1.576$, $p = 0.210$, partial $\eta^2 = .004$, respectively. Work hope and vocational outcome expectations were significantly higher among CIS treatment participants compared to

control group participants. Alpha was adjusted for the multiple group mean tests on each DV (i.e., .05/4 = .0125) to maintain the probability of type I error at .05 (see Table 14).

Table 14
MANCOVA Main Effects for Treatment Controlling for Pretest Variables (N=394)

Posttest Variable	CIS Treatment			Control					
	n	*M*	*SD*	*n*	*M*	*SD*	*F*(1,389)	*p*	η_p^2
VSSE	203	3.82	.66	191	3.63	0.76	3.425	.065	.009
VOE	203	3.45	.42	191	3.27	0.64	7.379	.007*	.019
WH	203	5.37	.85	191	4.98	0.93	8.490	.004*	.021
CP	203	3.17	.47	191	3.06	0.51	3.425	.065	.009

Note. *$p < 0.0125$. VSSE = Vocational Skills Self-Efficacy. VOE = Vocational Outcome Expectations. WH = Work Hope. CP = Career Planning. One participant was excluded from this analysis as they did not report their SES.

The second MANCOVA was conducted to compare treatment groups and SES groups across the three CDDQ subscales, including the "lack of readiness" subscale, "lack of information" subscale, and the "inconsistent information" subscale, while controlling for pretest differences. Treatment group and SES were the independent variables and the three CDDQ subscales were dependent variables, while pretest CDDQ subscales were treated as covariates.

Box's M Test was non-significant, indicating equality of variances, $F(18, 305724) = 1.471$, $p = .089$. MANCOVA results demonstrated no significant interaction between treatment group and SES group, Wilks' $\Lambda = .989$, $F(3, 387) = 1.485$, $p = .218$, partial $\eta^2 = .011$. MANCOVA results indicated no significant differences in SES groups, Wilks' $\Lambda = .986$, $F(3, 387) = 1.799$, $p = .147$, partial $\eta^2 = .014$. Consistent with hypothesis 1, MANCOVA results also indicated significant differences in treatment group, Wilks' $\Lambda = .917$, $F(3, 387) = 11.721$, $p < .001$, partial $\eta^2 = .083$.

Treatment group had one statistically significant root of the multivariate solution. The treatment group root of the multivariate solution was statistically significant, accounting for 8.3% of the variance explained by the model. Examination of associated standardized discriminant function coefficients (*SDFC*) used to weight the multivariate composite revealed that the "inconsistent information" subscale (*SDFC* = 1.09) was the most important in forming the function that discriminated treatment and control group. The "lack of readiness" subscale (*SDFC* -0.26) and the "lack of information" subscale (*SDFC* = -0.01) contributed less to the formation of the function. Inspection of the structure coefficients indicated that the observed measures had strong to low correlations with the multivariate composite. The "inconsistent information" subscale (r = 0.97) had the strongest correlation with the multivariate composite, while the "lack of information" subscale (r = 0.61) had a moderate correlation with the multivariate composite. The "lack of readiness" subscale (r = 0.20) was the least correlated with the function that discriminated the SES groups.

The univariate *F* tests demonstrated significant differences between CIS treatment and control for the "lack of information" subscale $F(1, 389) = 13.362$, $p < .001$, partial $\eta^2 = .033$ and the "inconsistent information" subscale $F(1, 389) = 33.420$, $p < .001$, partial $\eta^2 = .079$. The *F* test was not significant for the "lack of readiness" subscale, $F(1, 389) = 1.492$, $p = .223$, partial $\eta^2 = .004$. The alpha was adjusted for the multiple group mean tests on each DV (i.e., .05/3 = .017) to maintain the probability of type I error at .05. Both "lack of information" and "inconsistent information" were significantly lower for CIS treatment compared to the control group at posttest (see Table 15).

Table 15
MANCOVA Main Effects for Treatment Controlling for Pretest Variables (N=394)

Posttest Variable	CIS Treatment			Control					
	n	*M*	*SD*	*n*	*M*	*SD*	*F*(1,354)	*p*	η_p^2
$CDDQ_1$	203	4.38	1.36	191	4.82	1.57	1.921	.167	.005
$CDDQ_2$	203	3.56	1.77	191	4.47	1.92	13.935	<.001*	.035
$CDDQ_3$	203	3.20	1.63	191	4.43	2.02	34.452	<.001*	.081

Note. *$p < 0.017$. $CDDQ_1$= CDDQ "lack of readiness" subscale. $CDDQ_2$= CDDQ "lack of information" subscale. $CDDQ_3$= CDDQ "inconsistent information" subscale. One participant was excluded from this analysis as they did not report their SES.

Overall, the interaction effect of the first MANCOVA was also not statistically significant between treatment group and SES at posttest when controlling for pretest career variables. Work hope and vocational outcome expectations were significantly higher among CIS treatment participants compared to control group participants. Participants receiving free and reduced lunch were not significantly different compared to participants who do not receive free and reduced lunch in regards to vocational skills self-efficacy, vocational outcome expectations, work hope, or career planning at posttest while controlling for pretest scores.

The second MANCOVA demonstrated that "lack of information" and "inconsistent information" were significantly lower for CIS treatment compared to the control group. Participants receiving free and reduced lunch were not significantly different compared to participants who do not receive free and reduced lunch in regards to the three career decision-making difficulties variables at posttest. The interaction effect of the MANCOVA was not statistically significant between treatment group and SES for the three career decision-making difficulties variables at posttest when controlling for pretest career variables.

Hypothesis 4 (School A): Students exposed to the CIS treatment will have more changes in their postsecondary education plans compared to the control group at posttest.

A series of multinomial regression analyses were conducted to examine the extent to which treatment group participants differed from control group participants in their likelihood of identifying different postsecondary education plans at posttest, while controlling for postsecondary education plans at pretest. Multinomial logistic regression is a method of predicting a categorical variable with more than two categories, which departs from normality and/or is not using an ordered categorical or continuous variable (Tabachnick & Fidell, 2012). An equation is solved for each category (reference category) of the variable in this analysis. This equation predicts the probability (i.e. odds ratios) that an individual would be in a particular category (e.g. 4-year college plans) over another category (e.g. no post-secondary education plans) (Tabachnick & Fidell, 2012).

Postsecondary education plans included the following options: no plans, specialized training, military, 2-year community college, and 4-year college. Postsecondary education plans is the outcome variable and treatment group is the independent variable, while postsecondary plans at pretest was the covariate. As expected, the omnibus test of the effects of pretest postsecondary plans for posttest postsecondary plans were significant ($\chi^2 = 123.829$, $df = 4$, $p < .001$). The omnibus test of the effects of treatment group for predicting postsecondary plans at posttest, while controlling for postsecondary plans at pretest was not significant ($\chi^2 = 7.990$, $df = 4$, $p = .092$). In order to evaluate the impact of treatment group on each of the postsecondary plans at posttest, I reran the regression using each postsecondary plan as a reference category and examined

parameter estimates. In selecting “no plans” as a reference category, I found student’s in the CIS treatment were more likely to choose specialized training over no plans (odds ratio = 4.905, p =.046), 2-year community college over no plans (odds ratio = 3.364, p = .019), and 4-year college over no plans (odds ratio = 3.19, p =.016), while military was not significant (odds ratio = 1.748, p = .383). There was no difference in the likelihood of choosing military over no plans for treatment relative to control group. Each other postsecondary education options served as the reference group in subsequent analyses, and no additional comparisons were found to be statistically significant. In sum, treatment group participants were more likely to choose specialized training, 2-year community college, or 4-year college instead of no education plans compared to control group participants.

Hypothesis 5 (School A): Students exposed to the CIS treatment will have more changes in their occupational interests compared to the control group at posttest.

In order to examine changes in occupational goals, participants were asked what two occupations they were most interested in at pretest and posttest. From their occupational responses, I created a variable which identifies changes in occupational goals. Pretest and posttest occupation goals were compared and coded to demonstrate any changes in posttest occupation goals. No change (coded as “0”) indicated that participants maintained the same occupations at pretest and posttest test. One occupational change (coded as “1”) indicated that participants identified one new occupation of interest and kept one of the same occupations from pretest; for instance, one participant identified “midwife” and “animal rescuer” at pretest and “midwife” and “nurse practitioner” at posttest. Two occupational changes (coded as “2”) indicated that participants identified

two new occupations of interest at posttest; for example, one participant identified "health care administrator" and "nutritionist" at pretest and then identified "pharmacist" and "teacher" at posttest. Responses in which occupations were more specific at posttest compared to pretest were coded having a change; for example, a participant who identified "engineer" at pretest and "aerospace engineer" at posttest was coded as having a change. Participants who did not respond to the occupations of interest items at pretest or posttest were excluded from this analysis.

A chi-square (χ^2) test of independence was used to examine changes in occupations of interest between treatment and control group. Chi-square analysis examines the relationship between two discrete variables by generating expected frequencies and comparing them against observed frequencies among the two variables (Tabachnick & Fidell, 2012). The chi-square test of independence comparing frequency of occupational changes in treatment and control participants was significant (χ^2 (2) = 10.482, $p < .005$. Treatment group participants were more likely to have changed their occupational interests at posttest compared to control group participants. Chi-square analysis of treatment group and occupational changes are provided in Table 16.

Table 16
Chi-square Test and Descriptive Statistics for Occupational Change by Treatment (N = 308)

	CIS treatment		Control		Total	
Occupation change	*n*	%	*n*	%	*n*	%
No change	53	33%	64	44%	126	41%
One change	63	39%	62	42%	135	44%
Two changes	46	28%	20	14%	47	15%
Total	162		146		308	

Note. $\chi^2 = 10.482$, $df = 2$, $p = .005$. Column percentages indicate the percentage of occupational change in each treatment group.

Preliminary Analyses: School B

Data was initially screened for outliers, examined for skew and kurtosis, and examined for patterns of missing data and to replace missing values (Tabachnick & Fidell, 2012). Data from 11 respondents were excluded from the analyses due to incomplete surveys or response across measures that appeared to be answered disingenuously. Data screening demonstrated one univariate outlier on the measure of Vocational Outcome Expectations and Career Decision-Making Difficulties. Examination of the raw data for the Vocational Outcome Expectations and Career Decision-Making Difficulties outlier revealed the outlying score was outside the acceptable range of scores and did not appear to be a genuine response for the participant. As such, the outlier was deleted in the data analysis.

Skewness and kurtosis were examined for each variable in this study, and responses on each measure were within an acceptable range. Scores for the variables of VSSE, VOE, WH, CP, and CDDQ were all relatively within the recommended range of -1 to 1 for skew and kurtosis (Tabachnick & Fidell, 2012). Data from Vocational Outcome Expectations were slightly negatively skewed at pretest and posttest, but statistics such as multivariate analyses of covariance were selected to test hypotheses, given that they are robust to such moderate violations or normality (Tabachnick & Fidell, 2012). Data for each of the other dependent variables were normally distributed.

A chi-square (χ^2) test of independence was used to examine differences in prior use of CIS between treatment and control group participants. Chi-square analysis observes the relationship between two variables by generating expected frequencies and comparing them against observed frequencies among the two variables (Tabachnick &

Fidell, 2012). The chi-square test of independence comparing prior use of CIS in treatment and control participants was non-significant (χ^2 (2) = 1.149, p = .284). Prior use of CIS did not differ in regards to treatment group and control groups in School B.

Mean scale scores for the seven measures (i.e. VSSE, VOE, WH, CP, and CDDQ subscales) were created based on item level data, with means calculated when less than 10% of the item responses are missing, as recommended by Bennett (2001). Of the 364 responses, the amount of missing mean scale scores ranged from 0% to 13.19% for pretest measures and ranged from 0% to 32.69% per posttest measures (see Table 17). The missing at random (MAR) assumption was not tenable (χ2[1489] = 1638.1, p = .004) as per Little's MCAR test (Little & Rubin, 1987). Chi-square tests of independence with indicator variables created to denote missingness at pretest and missingness at posttest were utilized to compare missingness by gender, race/ethnicity, SES, and treatment group (i.e. CIS treatment and control group). There were no differences in missingness at pretest as a function of SES, race/ethnicity, or treatment group. The relationship between gender and missingness at pretest measures was significant (χ^2 (2, N=353) = 13.23, p < .01). Males were less likely to complete measures at pretest. There were also no differences in missingness at posttest as a function of gender, SES, race/ethnicity, or treatment group.

We used imputation with the Expectation Maximization (EM) algorithm to deal with missing scale values with the exception of missing data for demographic variables (Dempster, Laird, & Rubin, 1977). For each analysis, I compared the findings with and without imputed values as a final test of the influence of missing data. Results did not differ significantly based on imputed values.

Table 17
Means, Standard Deviations, and Percent of Missing Outcome Variables (N=364)

	Non-imputed				Imputed		
Variable	Percent Missing	*n*	*M*	*SD*	*n*	*M*	*SD*
Pretest							
VSSE	9.34%	330	3.72	0.67	364	3.72	0.67
VOE	9.62%	329	3.47	0.47	364	3.44	0.47
WH	10.16%	327	5.39	0.96	364	5.35	0.96
CP	10.16%	327	3.19	0.49	364	3.18	0.49
$CDDQ_T$	10.71%	325	3.81	1.57	364	3.83	1.49
$CDDQ_1$	10.71%	325	4.37	1.40	364	4.41	1.36
$CDDQ_2$	12.91%	317	3.63	1.98	364	3.68	1.89
$CDDQ_3$	13.19%	316	3.37	1.86	364	3.39	1.78
Posttest							
VSSE	29.67%	256	3.74	0.74	364	3.71	0.71
VOE	30.22%	254	3.43	0.53	364	3.37	0.51
WH	32.14%	247	5.19	1.00	364	5.09	1.02
CP	31.87%	248	3.18	0.55	364	3.14	0.50
$CDDQ_T$	31.87%	248	4.00	1.70	364	4.11	1.53
$CDDQ_1$	31.87%	248	4.56	1.60	364	4.56	1.47
$CDDQ_2$	32.97%	244	3.77	2.06	364	3.88	1.89
$CDDQ_3$	32.69%	245	3.68	2.02	364	3.89	1.85

Note. VSSE = Vocational Skills Self-Efficacy (possible score range, 1-5); VOE = Vocational Outcome Expectations (possible score range 1-4); WH = Work Hope (possible score range 1-7); Career Planning (possible score range 1-4); $CDDQ_T$= Career Decision-Making Difficulties Questionnaire total (possible score range 1-9); $CDDQ_1$= CDDQ "lack of readiness" subscale (possible score range 1-9); $CDDQ_2$= CDDQ "lack of information" subscale (possible score range 1-9); $CDDQ_3$= CDDQ "inconsistent information" subscale (possible score range 1-9).

Descriptive Data: School B

Descriptive data for School B were examined prior to hypothesis testing. Table 18 includes means and standard deviations for outcome variables across gender, race/ethnicity, and free and reduced lunch. As described in School A, White and Asian students in the state of Oregon demonstrate higher graduation rates and higher achievement in math and reading compared to all other ethnic groups (Oregon Department of Education, 2016). As such, results regarding ethnicity are compared

between “White and Asian” and “all other ethnic groups.” Table 19 shows the correlation matrix for the dependent variables VSSE, VOE, WH, CP, and the three CDDQ subscales at pretest.

Table 18
Grand Means and Standard Deviations for Outcome Variables at Pretest (N=364)

Variable		VSSE	VOE	WH	CP	$CDDQ_T$	$CDDQ_1$	$CDDQ_2$	$CDDQ_3$
CIS Treatment	Mean	3.68	3.44	5.33	3.15	3.85	4.47	3.69	3.37
	SD	0.71	0.47	0.96	0.47	1.46	1.34	1.91	1.73
	n	212	212	212	212	212	212	212	212
Control	Mean	3.77	3.44	5.39	3.21	3.81	4.33	3.66	3.43
	SD	0.61	0.48	0.96	0.52	1.54	1.38	1.88	1.84
	n	152	152	152	152	152	152	152	152
Female	Mean	3.72	3.46	5.4	3.15	3.75	4.31	3.67	3.26
	SD	0.69	0.47	0.94	0.5	1.54	1.37	1.96	1.81
	n	185	185	185	185	185	185	185	185
Male	Mean	3.77	3.51	5.42	3.27	3.84	4.46	3.59	3.46
	SD	0.59	0.43	0.89	0.46	1.54	1.41	1.93	1.84
	n	139	139	139	139	139	139	139	139
White/Asian	Mean	3.78	3.52	5.46	3.22	3.67	4.26	3.56	3.18
	SD	0.66	0.44	0.91	0.49	1.54	1.37	1.96	1.82
	n	214	214	214	214	214	214	214	214
All other race/ethnicity	Mean	3.66	3.39	5.28	3.16	4.02	4.58	3.82	3.66
	SD	0.65	0.49	0.98	0.48	1.51	1.35	1.95	1.79
	n	117	117	117	117	117	117	117	117
No free and lunch	Mean	3.64	3.4	5.23	3.19	3.87	4.36	3.73	3.52
	SD	0.66	0.49	0.98	0.49	1.5	1.37	1.91	1.84
	n	144	144	144	144	144	144	144	144
Free and reduced lunch	Mean	3.79	3.51	5.5	3.19	3.74	4.37	3.61	3.22
	SD	0.68	0.46	0.92	0.5	1.57	1.37	2.01	1.81
	n	3.68	3.44	5.33	3.15	3.85	4.47	3.69	3.37

Note. VSSE = Vocational Skills Self-Efficacy (possible score range, 1-5); VOE = Vocational Outcome Expectations (possible score range 1-4); WH = Work Hope (possible score range 1-7); Career Planning (possible score range 1-4); $CDDQ_T$= Career Decision-Making Difficulties Questionnaire total (possible score range 1-9); $CDDQ_1$= CDDQ “lack of readiness” subscale (possible score range 1-9); $CDDQ_2$= CDDQ “lack of information” subscale (possible score range 1-9); $CDDQ_3$= CDDQ “inconsistent information” subscale (possible score range 1-9).

Table 19
Correlations between Outcome Variables at Pretest (N = 364)

Variable	1	2	3	4	5	6	7	8
1. VSSE	-							
2. VOE	.59	-						
3. WH	.60	.76	-					
4. CP	.66	.55	.61	-				
5. $CDDQ_T$	-.36	-.41	-.52	-.36	-			
6. $CDDQ_1$	-.20	-.24	-.33	-.18	.79	-		
7. $CDDQ_2$	-.38	-.40	-.53	-.41	.93	.59	-	
8. $CDDQ_3$	-.34	-.42	-.49	-.35	.93	.60	.83	-

Note. All correlations were statistically significant at $p < .001$. VSSE = Vocational Skills Self-Efficacy. VOE = Vocational Outcome Expectations. WH = Work Hope. CP = Career Planning. $CDDQ_T$= Career Decision-Making Difficulties Questionnaire total score. $CDDQ_1$= CDDQ "lack of readiness" subscale. $CDDQ_2$= CDDQ "lack of information" subscale. $CDDQ_3$= CDDQ "inconsistent information" subscale.

Main Analyses: School B

Hypothesis 1 (School B): Exposure to CIS treatment will be associated with increases in students' vocational skills self-efficacy, outcome expectations, work hope, and career planning, and decreases in career decision-making difficulties.

Two multivariate analysis of covariance (MANCOVAs) were conducted to compare treatment group posttest differences in vocational skills self-efficacy, outcome expectations, work hope, and career planning, and career decision-making difficulties while controlling for pretest differences. VSSE, VOE, WH, and CP scales were assessed independently from CDDQ subscales.

The first MANCOVA was conducted to compare treatment group (i.e. treatment vs. control) posttest differences in VSSE, VOE, WH, and CP, while controlling for pretest differences. Treatment group was the independent variable and VSSE, VOE, WH, and CP posttest scores were dependent variables, while pretest variables were treated as

covariates. Results of the MANCOVA are presented in Table 20. Box's M Test was non-significant, indicating equality of variances, $F(10, 497147) = 1.575$, $p = .107$.

MANCOVA results revealed significant differences between the CIS intervention and control group on the outcome variables, Wilks' $\Lambda = .968$, $F(4,358) = 2.954$, $p = .020$, partial $\eta^2 = .032$. One root of the multivariate solution was statistically significant, accounting for 3.2% of the variance explained by the model. Examination of associated standardized discriminant function coefficients (*SDFC*) used to weight the multivariate composite revealed that vocational skills self-efficacy (*SDFC* = -0.78) and work hope (*SDFC* = -0.56) were most important in forming the function that discriminated treatment and control group. Career planning (*SDFC* = -0.18) and vocational outcome expectations (*SDFC* = 0.45) contributed less to the function. Inspection of the structure coefficients indicated that the observed measures had moderate to strong correlations with the multivariate composite. Vocational skills self-efficacy ($r = -0.88$) and work hope ($r = -0.69$) were highly correlated with the function that discriminated the treatment and control group. Career planning ($r = -0.61$) and vocational outcome expectations ($r = -0.40$) demonstrated a moderate correlation.

Alpha was adjusted for the multiple group mean tests on each DV (i.e., .05/4 = .0125) to maintain the probability of type I error at .05. The univariate *F* tests demonstrated significant differences between CIS treatment and control for vocational skills self-efficacy $F(1, 361) = 9.193$, $p = .003$, partial $\eta^2 = .025$. The effect size for vocational skills self-efficacy was small. The *F* tests were no longer significant with the adjusted alpha for work hope $F(1, 361) = 5.632$, $p = .018$, partial $\eta^2 = .015$, or career planning $F(1, 361) = 4.491$, $p = .035$, partial $\eta^2 = .0012$. Vocational outcome

expectations were also not significant, $F(1, 358) = 1.882$, $p = 0.171$., partial $\eta^2 = .005$. Vocational skills self-efficacy was significantly higher for CIS treatment participants compared to the control group participants at posttest. A summary of MANCOVA results is presented in Table 20.

Table 20
Multivariate Analysis of Covariance for Treatment Controlling for Pretest Variables (N=364)

Posttest Variable	CIS Treatment			Control					
	n	*M*	*SD*	*n*	*M*	*SD*	*F*(1,361)	*p*	η_p^2
VSSE	212	3.78	.65	152	3.60	.76	9.193	.003*	.025
VOE	212	3.39	.47	152	3.34	.57	1.882	.171	.005
WH	212	5.16	.96	152	4.99	1.07	5.632	.018	.015
CP	212	3.17	.48	152	3.09	.53	4.491	.035	.012

Note. *$p < 0.0125$. VSSE = Vocational Skills Self-Efficacy. VOE = Vocational Outcome Expectations. WH = Work Hope. CP = Career Planning.

The second MANCOVA was conducted to compare treatment group (i.e. treatment vs. control) posttest differences in the three CDDQ subscales, including the "lack of readiness" subscale, "lack of information" subscale, and the "inconsistent information" subscale, while controlling for pretest differences. Treatment group was the independent variable and the three CDDQ subscales were dependent variables, while pretest CDDQ subscales were treated as covariates. Box's M Test was non-significant, indicating equality of variances, $F(6, 725640) = 1.869$, $p = .082$.

MANCOVA results revealed no significant differences between the CIS intervention and control group on the CDDQ subscales, Wilks' $\Lambda = .992$, $F(3,359) = 0.757$, $p = .385$, partial $\eta^2 = .008$. Participants in the CIS intervention were not significantly different from control group participants in regards to their career decision-making difficulties at posttest. MANCOVA results are presented in Table 21.

Table 21
Multivariate Analysis of Covariance for Treatment Controlling for Pretest Variables (N=364)

Posttest Variable	CIS Treatment			Control					
	n	*M*	*SD*	*n*	*M*	*SD*	*F*(1,361)	*p*	η_p^2
$CDDQ_1$	212	4.55	1.36	152	4.57	1.59	.072	.072	<.001
$CDDQ_2$	212	3.80	1.88	152	3.98	1.90	1.530	.217	.004
$CDDQ_3$	212	3.78	1.84	152	4.03	1.86	2.841	.093	.008

Note. *$p < 0.017$. $CDDQ_1$= CDDQ "lack of readiness" subscale. $CDDQ_2$= CDDQ "lack of information" subscale. $CDDQ_3$= CDDQ "inconsistent information" subscale.

Overall, the first MANCOVA demonstrated that participants in the treatment group had higher vocational skills self-efficacy at posttest when controlling for pretest variables, compared to participants in the control condition. The second MANCOVA demonstrated that treatment group participants did not demonstrate statistically significant differences in career decision-making difficulties compared to their counterparts when controlling for pretest career variables.

Hypothesis 2 (School B): The effects of CIS vary as a function of participant race/ethnicity.

A series of two-way multivariate analysis of covariance (MANCOVAs) were conducted to examine any potential interaction between treatment group and race/ethnicity (i.e. White and Asian compared to all other race/ethnicity) on outcome variables, while controlling for pretest differences. VSSE, VOE, WH, and CP scales were assessed independently from CDDQ subscales, given that they were highly correlated with one another and less correlated with CDDQ subscales.

The first MANCOVA was conducted to compare treatment group and race/ethnicity across VSSE, VOE, WH, and CP at posttest, while controlling for pretest differences. Treatment group and race/ethnicity were the two independent variables, and

posttest VSSE, VOE, WH, and CP scores were the dependent variables. Pretest VSSE, VOE, WH, and CP scores were treated as covariates. Box's M Test was non-significant, indicating equality of variances, $F(30, 154455) = 1.187$, $p = .221$. MANCOVA results demonstrated no significant interaction between treatment group and race/ethnicity, Wilks' $\Lambda = .997$, $F(4, 354) = 0.248$, $p = .911$, partial $\eta^2 = .003$. MANCOVA results indicated no significant differences in race/ethnicity, Wilks' $\Lambda = .988$, $F(4, 354) = 1.071$, $p = .371$, partial $\eta^2 = .012$. MANCOVA results also indicated no significant differences in treatment group, Wilks' $\Lambda = .977$, $F(4, 354) = 2.056$, $p = .086$, partial $\eta^2 = .023$. There were no significant interactions between participant's race/ethnicity and treatment group in regards to vocational outcome expectations, vocational outcomes, work hope, or career planning at posttest.

The second MANCOVA was conducted to compare treatment group and race/ethnicity across the three CDDQ subscales, including the "lack of readiness" subscale, "lack of information" subscale, and the "inconsistent information" subscale, while controlling for pretest differences. Treatment group was the independent variable and the three CDDQ subscales were dependent variables, while pretest CDDQ subscales were treated as covariates. Treatment group and race/ethnicity were the two independent variables, and the three CDDQ subscale posttest scores were the dependent variables. The three pretest CDDQ subscale scores were treated as covariates. Box's M Test was non-significant, indicating equality of variances, $F(18, 187440) = 1.662$, $p = .038$. MANCOVA results demonstrated no significant interaction between treatment group and race/ethnicity, Wilks' $\Lambda = .998$, $F(3, 355) = 0.281$, $p = .839$, partial $\eta^2 = .002$. MANCOVA results indicated no significant differences in race/ethnicity, Wilks' $\Lambda =$

.991, $F(3, 3, 355) = 1.103$, $p = .348$, partial $\eta^2 = .009$. MANCOVA results also indicated no significant differences in treatment group, Wilks' $\Lambda = .993$, $F(3, 355) = 0.818$, $p = .485$, partial $\eta^2 = .007$. There was no significant interaction between participant's race/ethnicity and treatment group in regards to career decision-making difficulties at posttest.

Overall, there was no significant interaction between participant's race/ethnicity and treatment group across any of the career variables when controlling for pretest scores. White and Asian participants were not different compared to participants from other racial/ethnic backgrounds in regards to vocational outcome expectations, vocational outcomes, work hope, career planning or career decision-making difficulties at posttest when controlling for pretest career variables. Similarly, participants in the treatment group were not different compared to participants in the control condition across any of the career variables when controlling for pretest scores.

Hypothesis 3 (School B): The effects of CIS vary as a function of SES.

A series of two-way multivariate analysis of covariance (MANCOVAs) were conducted to examine any potential interaction between treatment group and SES (free and reduced lunch vs. no free and reduced lunch) on outcome variables, while controlling for pretest differences. VSSE, VOE, WH, and CP scales were assessed separately from CDDQ subscales.

The first MANCOVA was conducted to examine any potential interaction between treatment group and SES (free and reduced lunch vs. no free and reduced lunch) on posttest differences, while controlling for pretest differences. Treatment group and SES were the two independent variables, and VSSE, VOE, WH, and CP posttest scores

were the dependent variables. Pretest VSSE, VOE, WH, and CP scores were treated as covariates. Box's M Test was non-significant, indicating equality of variances, $F(30, 250193) = 1.246$, $p = .166$. MANCOVA results demonstrated no significant interaction between treatment group and SES when controlling for pretest variables, Wilks' $\Lambda = .994$, $F(4, 350) = 0.539$, $p = .707$, partial $\eta^2 = .006$. MANCOVA results indicated no significant differences in treatment group, Wilks' $\Lambda = .974$, $F(4, 350) = 2.360$, $p = .053$, partial $\eta^2 = .026$. MANCOVA results also indicated no significant differences in SES, Wilks' $\Lambda = .992$, $F(4, 350) = 0.707$, $p = .588$, partial $\eta^2 = .008$. Treatment groups and SES groups (i.e. free and reduced lunch vs. no free and reduced lunch participants) were not significantly different in regards to vocational skills self-efficacy, vocational outcome expectations, work hope, or career planning.

The second MANCOVA was conducted to compare treatment groups and SES groups across the three CDDQ subscales, including the "lack of readiness" subscale, "lack of information" subscale, and the "inconsistent information" subscale, while controlling for pretest differences. Treatment group and SES were the independent variables and the three CDDQ subscales were dependent variables, while pretest CDDQ subscales were treated as covariates. Box's M Test was non-significant, indicating equality of variances, $F(18, 312615) = 2.108$, $p = .004$. MANCOVA results demonstrated no significant interaction between treatment group and SES group, Wilks' $\Lambda = .98$, $F(3, 351) = 2.419$, $p = 0.066$, partial $\eta^2 = .020$. MANCOVA results also indicated no significant differences in SES groups, Wilks' $\Lambda = .987$, $F(3, 351) = 1.599$, $p = .189$, partial $\eta^2 = .013$. Finally, MANCOVA results were also not significant for treatment group, Wilks' $\Lambda = .992$, $F(3, 351) = 0.987$, $p = .399$, partial $\eta^2 = .008$.

Treatment groups and SES groups (i.e. free and reduced lunch vs. no free and reduced lunch participants) were not significantly different in regards to three CDDQ subscales

Overall, there was no significant interaction between participant's SES and treatment group across any of the career variables when controlling for pretest scores. The first MANCOVA revealed that treatment groups and SES groups (i.e. free and reduced lunch vs. no free and reduced lunch participants) were not significantly different in regards to vocational skills self-efficacy, vocational outcome expectations, work hope, or career planning. Similarly, the second MANCOVA demonstrated that treatment groups and SES groups (i.e. free and reduced lunch vs. no free and reduced lunch participants) were not significantly different in regards to the three CDDQ subscales when controlling for pretest career variables.

Hypothesis 4 (School B): Students exposed to the CIS treatment will have more differences in their postsecondary education plans compared to the control group at posttest.

A series of multinomial regression analyses were conducted to examine the extent to which treatment group participants differed from control group participants in their likelihood of identifying postsecondary plans at posttest, while controlling for postsecondary plans at pretest. As described in School A, multinomial logistic regression is a method of assessing a variable with more than two categories, which depart from normality or are not using an ordered categorical or continuous variable (Tabachnick & Fidell, 2012). An equation is solved for each category (reference category) of the variable in this analysis. This equation predicts the probability (i.e. odds ratios) that an individual would be in a particular category over another category (Tabachnick & Fidell, 2012).

Postsecondary education plans included the following options: no plans, specialized training, military, 2-year community college, and 4-year college. Treatment group was the independent variable and postsecondary education plans was the dependent variable, while postsecondary plans at pretest were the covariates. As expected, the omnibus test of the effects of pretest postsecondary plans predicting posttest postsecondary plans were significant ($\chi^2 = 113.382$, $df = 4$, $p < .001$). The omnibus test of the effects of treatment group for predicting postsecondary plans at posttest, while controlling for postsecondary plans at pretest was not significant ($\chi^2 = 4.279$, $df = 4$, $p = .370$). In order to evaluate the impact of treatment group on each of the postsecondary plans at posttest, I reran the regression using each postsecondary plan as a reference category. Each other postsecondary education option served as the reference group in subsequent analyses, and no comparisons were found to be statistically significant. Treatment group participants were not more likely to change their postsecondary education plans at posttest compared to control group participants when controlling for their plans at pretest.

Hypothesis 5 (School B): Students exposed to the CIS treatment will have more differences in their occupational interests compared to the control group at posttest.

Participants were asked to identify two occupations that they were most interested in at pretest and posttest to assess changes in occupational interests. From participants' occupational responses, I created a variable which identifies changes in occupational goals. Pretest and posttest occupation responses were compared and coded to demonstrated changes in posttest occupation goals. No change (coded as "0") indicated that participants maintained the same occupations at pretest and posttest. One occupational change (coded as "1") indicated that participants identified one new

occupation of interest and kept one of the same occupations from pretest; for instance, one participant identified “architecture” and “construction – build houses” at pretest and “architecture” and “business – run a restaurant” at posttest. Two occupational changes (coded as “2”) indicated that participants identified two new occupations of interest at posttest; for example, one participant identified “chef” and “paramedic” at pretest and then identified “probation officer” and “nurse” at posttest. Responses in which occupations were more specific at posttest compared to pretest were coded as having a change; for example, a participant who identified “teaching” at pretest and “special education teacher” at posttest was coded as having a change. Participants who did not respond to the occupations of interest items at pretest or posttest were excluded from this analysis.

A chi-square (χ^2) test of independence was used to examine changes in occupations of interest between treatment and control group. Chi-square analysis examines the relationship between two discrete variables by generating expected frequencies and comparing them against observed frequencies between the two variables (Tabachnick & Fidell, 2012). The chi-square test of independence comparing frequency of occupational changes in treatment and control participants was significant (χ^2 (2) = 10.482, $p < .005$). Treatment group participants were more likely to change their occupational interests at posttest compared to control group participants. A summary of the chi-square analysis of treatment group and occupational interest changes was provided in Table 22.

Table 22
Chi-square Test and Descriptive Statistics for Occupational Change by Treatment (N = 230)

	CIS treatment		Control		Total	
Occupation change	*n*	%	*n*	%	*n*	%
No change	41	30%	52	57%	93	40%
One change	79	57%	33	36%	112	49%
Two changes	18	13%	7	8%	25	11%
Total	138		92			

Note. $\chi^2 = 16.494$, $df = 2$, $p < .001$. Column percentages indicate the percentage of occupational change in each treatment group.

Summary of Hypothesis Testing: School A and School B

As previously described, each of the 2 sites included in this study implement CIS differently, thus the results were presented in a School A/School B format. The proposed hypotheses were identical for both School A and School B. A summary of the five hypotheses across both School A and School B are presented in Table 23.

Additionally, the main analyses for School A and School B were treatment and control group participants' career outcomes at posttest controlling for pretest variables, thus a summary of the findings in Hypothesis 1 for both School A and School B are presented together for ease of comparison in Table 24.

Table 23
Summary of Hypothesis Testing for School A and School B (N = 759)

Hypothesis	School A (n = 395)	School B (n = 364)
1) Exposure to CIS treatment will be associated with increases in students' VSSE, VOE, WH, and CP, and decreases in CDDQ.	Partially Supported: Treatment participants' VOE and WH were higher than control participants. Treatment participants' CDDQ_2 and CDDQ_3 were lower than control participants.	Partially Supported: Treatment participants' VSSE were significantly higher than control participants.
2) The effects of CIS vary as a function of participant race/ethnicity.	Not Supported: White and Asian participants were not significantly different compared to participants from other racial/ethnic backgrounds with respect to VSSE, VOE, WH, CP, and CDDQ subscales. The interaction between race/ethnicity and treatment group was not significant.	Not Supported: White and Asian participants were not significantly different compared to participants from other racial/ethnic backgrounds with respect to VSSE, VOE, WH, CP, and CDDQ subscales. The interaction between race/ethnicity and treatment group was not significant.
3) The effects of CIS vary as a function of SES.	Not Supported: SES group was not significantly different in regards to VSSE, VOE, WH, CP, and CDDQ subscales. The interaction between SES and treatment group was not significant.	Not Supported: SES group was not significantly different in regards to VSSE, VOE, WH, CP, and CDDQ subscales. The interaction between SES and treatment group was not significant.
4) Students exposed to the CIS treatment will have more differences in their postsecondary education plans compared to the control group at posttest.	Partially Supported: Treatment group participants were more likely to choose specialized training, 2-year community college, or 4-year college instead of no education plans compared to control group participants.	Not Supported: Treatment group participants were not more likely to change their postsecondary education plans at posttest compared to control group participants.
5) Students exposed to the CIS treatment will have more differences in their occupational interests compared to the control group at posttest.	Supported: Treatment group participants were more likely to have changed their occupational interests at posttest compared to control group participants.	Supported: Treatment group participants were more likely to change their occupational interests at posttest compared to control group participants.

Note. VSSE = Vocational Skills Self-Efficacy. VOE = Vocational Outcome Expectations. WH = Work Hope. CP = Career Planning. $CDDQ_1$= CDDQ "lack of readiness" subscale. $CDDQ_2$= CDDQ "lack of information" subscale. $CDDQ_3$= CDDQ "inconsistent information" subscale.

Table 24

MANCOVA Summary of Hypothesis 1 Testing for School A and School B Treatment Controlling for Pretest Variables (N=759)

Posttest Variable	School	CIS Treatment			Control					
		n	*M*	*SD*	*n*	*M*	*SD*	*F*	*p*	η_p^2
VSSE	School A	203	3.82	0.66	192	3.58	0.82	2.939	.087	.007
	School B	212	3.78	0.65	152	3.60	0.76	9.193	.003*	.025
VOE	School A	203	3.44	0.41	192	3.24	0.66	6.653	.010*	.017
	School B	212	3.39	0.47	152	3.34	0.57	1.882	.171	.005
WH	School A	203	5.32	0.84	192	4.94	0.92	10.176	.002*	.025
	School B	212	5.16	0.96	152	4.99	1.07	5.632	.018	.015
CP	School A	203	3.17	0.46	192	3.02	0.55	1.947	.164	.005
	School B	212	3.17	0.48	152	3.09	0.53	4.491	.035	.012
$CDDQ_1$	School A	203	4.39	1.37	192	4.82	1.57	3.168	.076	.008
	School B	212	4.55	1.36	152	4.57	1.59	0.072	.072	<.001
$CDDQ_2$	School A	203	3.57	1.78	192	4.48	1.93	16.272	<.001*	.040
	School B	212	3.8	1.88	152	3.98	1.9	1.530	.217	.004
$CDDQ_3$	School A	203	3.21	1.63	192	4.42	2.03	34.784	<.001*	.082
	School B	212	3.78	1.84	152	4.03	1.86	2.841	.093	.008

Note. **p* < 0.05. MANCOVA analyses of treatment groups in School A and School B were conducted separately. This table presents the findings reported in Tables 9 and 10 from School A and Tables 20 and 21 from School B together for ease of comparison. VSSE = Vocational Skills Self-Efficacy. VOE = Vocational Outcome Expectations. WH = Work Hope. CP = Career Planning. $CDDQ_1$= CDDQ "lack of readiness" subscale. $CDDQ_2$= CDDQ "lack of information" subscale. $CDDQ_3$= CDDQ "inconsistent information" subscale.

CHAPTER IV

DISCUSSION

In this chapter, I discuss the findings of the study across both schools. The discussion section is organized in the following structure: purpose of the study, overall summary of results, discussion of each hypothesis, study strengths and limitations, implications, and conclusion. Although the results section was separated by school site (i.e. School A & School B), the discussion section addresses differences and similarities of results in both schools with respect to the different applications of CIS (i.e. distinct CIS self-assessment modules).

The purpose of this study was to examine the effects of Career Information System (CIS) on high school first-year students' vocational skills self-efficacy, outcome expectations, work hope, career planning, career decision-making difficulties, and postsecondary plans across two school settings. As previously described, CIS is an internet-based computer system of occupational and educational information aimed at increasing users' knowledge about the labor market and education system as well as offering career planning support. This study was intended to provide evidence for the efficacy of a specific computer-assisted career guidance system for high school first-year students. Students from two high schools in the state of Oregon participated in this quasi-experimental study. Participants at School A were first-year students who completed the Interest Profiler component of CIS fall term or spring term. Participants at School B were first-year students who completed the Interest Profiler, IDEAS, SKILLS, Reality Check, and Work Importance Locator modules of CIS fall term or spring term. Participants from

both schools utilized the occupational information and programs of study information to gather information regarding specific occupations. Freshman students who did not participate in the CIS intervention fall term served as the control group in both schools. The analyses of the two schools were completed separately, given that different modules of CIS were utilized in each of the two schools.

Hypothesis 1

The first hypothesis postulated that exposure to CIS treatment was expected to be associated with increases in students' vocational skills self-efficacy, outcome expectations, work hope, and career planning, and decreases in career decision-making difficulties. This hypothesis was partially supported at both School A and School B. Treatment group participants in School A demonstrated higher work hope and vocational outcome expectations as well as lower career decision-making difficulties on two of the three subscales (specifically "lack of information" and "inconsistent information") compared to control participants at posttest. Posttest vocational skills self-efficacy, career planning, and lack of readiness (a career-decision making difficulty subscale) did not significantly differ for School A treatment and control groups. Treatment participants at School B had higher vocational skills self-efficacy compared to control participants at posttest while controlling for pretest differences. At School B, there were no significant differences at posttest for work hope, vocational outcome expectations, career planning, or career decision-making difficulties subscales.

The significant posttest differences in work hope at School A suggests increases in participants' willingness and motivation to pursue career-related goals with specific pathways following the use of CIS. Along with career goals and agency (i.e. motivation

or willingness), work hope emphasizes the importance of pathways; namely, strategies on how to achieve career goals (Juntunen & Wetterson, 2006). CIS is designed to provide users with occupational information, including requirements to pursue occupations of interest (e.g. educational and licensure requirements). Such information may provide the user with a potential understanding of the pathways needed to pursue such goals. As such, the use of CIS career assessments (i.e. Interest Profiler) in conjunction with relevant occupation information (e.g. scholarships, education requirements, etc.) may provide CIS users with the pathways necessary to achieve their goals, as indicated in the association between higher work hope at posttest among School A treatment group participants compared to control group participants.

School A treatment participants were also found to have higher vocational outcome expectations at posttest compared to control group participants. SCCT posits that learning outcomes and individuals' confidence in their ability to complete career-related activities and tasks (i.e. self-efficacy) establish expectations about vocational outcomes (Lent et al., 1994; Lent et al., 2000). Treatment group participants were found to have more positive expectations about actually obtaining a successful and satisfying career compared to control group participants at posttest, which suggests that their higher expectations about future career outcomes were associated with the use of CIS. These findings suggest that the CIS intervention may have served as a learning experience that facilitated their formation of career outcome expectations.

School A treatment participants' vocational skills self-efficacy expectations, however, were not found to be significantly different from control participants at posttest. CIS is designed to provide users with firsthand experiences in identifying personal

characteristics that align with various career options and exploring occupational information, however, there may be additional vocational skills that are not addressed within the CIS modules utilized at School A. Although the vocational skills self-efficacy measure utilized in the current sample was derived from high school curriculum (Metheny & McWhirter, 2013), the items may not have mapped well onto what CIS modules provided for the group of first-year high school students. Specifically, the Interest Profiler self-assessment and occupational information modules may not have provided changes in treatment participants' vocational skills self-efficacy, particularly in their current educational experiences related to future career goals. As described in the vocational skills self-efficacy measure items, vocational skills among first-year students may include the confidence in their ability to seek out academic experiences related to their future career goals (e.g. "Take responsibility for my education plans including my study habits" and "Choose high school courses that will prepare me for the future). SCCT posits that self-efficacy is domain-specific, such that one's confidence in one domain (e.g. mathematics) may not align with other domains (e.g. science) (Lent et al., 1994; Lent et al, 2000). Relatedly, exploring career options and information may be distinct from one's confidence in identifying academic courses relevant to distal career outcomes and related requirements. CIS modules at School A may not have addressed these first-year students' self-efficacy with respect to the specific vocational skills assessed.

Although School A treatment participants did not show a significant increase in their vocational skills self-efficacy, they did show an increase in their motivation and willingness to pursue goals with specific pathways (i.e. work hope) and vocational

outcome expectations. As previously discussed, Snyder, Rand, and Sigmon (2002) differentiate hope from self-efficacy and outcome expectations, such that self-efficacy is considered a predictor of outcome expectations, whereas hope theory asserts that agency and pathways mutually contribute to goal-directed behavior. Work hope and vocational outcome expectations were found to be correlated with vocational skills self-efficacy, however the distinct outcomes in work hope compared to vocational skills self-efficacy and vocational outcome expectations at posttest for School A treatment participants may demonstrate that participants using CIS have a greater motivation to pursue identified career goals, without necessarily having the perceived ability or confidence in their skillsets to pursue their career goals. The Interest Profiler and occupational information modules may have provided users with a greater understanding of their career goals and potential pathways to pursuing their goals by identifying career options and relevant information for pursuing those careers (e.g. education requirements and licensure requirements). These learning experiences, however, may not have resulted in students increasing their confidence in engaging in the pathways to meeting their career goals.

The use of CIS among School A treatment participants was not associated with increases in vocational skills self-efficacy, however, findings for School B suggest that other or more CIS self-assessment modules may contribute to increases in vocational skills self-efficacy among users. School B CIS treatment participants did demonstrate an increase in their vocational skills self-efficacy, which may highlight the effectiveness of the CIS SKILLS module in determining their vocational skills and their perceived ability (i.e. self-efficacy) to utilize such skills. Presumably, the CIS SKILLS module provided students with a clearer understanding of occupations that match their self-assessed

skillsets (e.g. social skills, reading and writing skills, technical skills, etc.), which in turn may have increased their confidence that they are capable of pursuing occupations that match their skillsets. Vocational skills self-efficacy measure items may have corresponded well with the changes in students' confidence related to their current vocational skillsets following the use of the CIS SKILLS module. For instance, vocational skills self-efficacy items include rating how confident they were that they could "describe the basic interpersonal skills required for most jobs." Additionally, the SKILLS assessment may have provided users with a greater understanding of their skills as they relate to their current education experiences. The experience of identifying skills that participants currently possess (i.e. math & science skills or writing & reading skills) related to their current education may have contributed to the increase in vocational skills self-efficacy scores at posttest among School B participants (e.g. "choose high school courses that will prepare me for the future"). As previously described, Social Cognitive Career Theory (Lent, Brown, & Hackett, 1994) posits that various learning experiences influence the development of career-related self-efficacy (beliefs about one's own capabilities in career-related domains). Learning experiences may include gaining knowledge of occupational information, firsthand and vicarious experiences, performance accomplishments, and career role modeling (Lent, Brown, & Hackett, 1994). The CIS SKILLS module may have provided students with the learning experience (or performance accomplishment) of connecting their current skillsets with educational experiences and career goals as indicated by the changes in vocational skill self-efficacy at School B. Given that the CIS SKILLS module was not utilized in School A, treatment group students at School A may not have been exposed to the performance

accomplishment of connecting skillsets with occupations and subsequently did not demonstrate changes in their vocational skills self-efficacy as was found in School B.

Neither School A nor School B CIS treatment participants demonstrated significantly higher career planning behaviors compared to control group participants. As described by Thompson and colleagues (1981), career planning reflects participants' belief in the importance of planning for the future and establishing tentative plans. Career planning in the current study was measured by assessing participants' investment in establishing plans for pursuing a career, such as plans to take courses that provide a better understanding of career options, or plans to seek out extra-curricular activities that will prepare one for future careers (Thompson et al., 1981). Although students engaged in exploring their own career-related interests and potential occupations, this apparently did not translate to higher immediate motivation to engage in career planning outside of the CIS intervention, at least the planning measured by the Career Planning measure. The current study examined first-year high school students, for whom career planning may seem less relevant than for sophomore, junior, or senior students. CIS is designed to support students' career preparation and planning by providing them with a greater understanding of their own characteristics (e.g. interests, skills, and values) and occupations. It may be that CIS contributes to motivation to engage in career planning for older high school students once they consider planning for the future to be more imminent and important.

Treatment group participants in School A demonstrated lower career decision-making difficulties (specifically "lack of information" and "inconsistent information") compared to their counterparts in the control condition at posttest. Such findings suggest

that participating in the CIS intervention reduced career decision-making difficulties associated with lack of information and inconsistent information. Participants were instructed to complete modules of CIS that were intended to provide information about their own interests as well as related information regarding occupations. “Lack of information” defined within the career decision-making difficulties taxonomy (Gati et al., 1996) encompasses subcategories of difficulties that may be address within CIS, including information of the self (e.g. “what do I want”) as well as information about various career alternatives and ways of obtaining additional information. The CIS Interest Profiler module is intended to provide users with a greater understanding of their own interests, which may provide them a clearer understanding of themselves within the career decision-making process. Likewise, CIS “occupational information” and “programs of study” modules include substantial occupational information, which may explain the association between decreased “lack of information” found among CIS users compared to control group participants. Additionally, Gati and colleagues (2001) posit that “inconsistent information” difficulties refers to unreliable information about the self and occupations as well as internal conflicts (e.g. contradictory preferences) and external conflicts (e.g. differing preferences of significant others). The decreased difficulties with unreliable information and external and internal conflicts among CIS users in School A may highlight the utility of CIS in providing accurate occupational and educational information specific to the state in which participants reside. Participants who utilized CIS may have perceived the information regarding themselves (e.g. interests) and occupational information as reliable and relevant to their career decision-making process. Relatedly, the role of CIS in providing information that is perceived to be reliable among

users may address potential internal conflicts (i.e. identifying relevant personal traits). The decrease in difficulties related to lack of information and inconsistent information found at School A highlight the potential benefits of CIS, particularly in regards to providing information relevant to career decision-making among high school students.

Although School A CIS treatment users demonstrated decreases in "lack of information" and "unreliable information" difficulties compared to control group members, they did not demonstrate significant decreases in "lack of readiness" difficulties. Given the developmental age of first-year high school students, not being ready to make a career decision may be normative with or without intervention. Career decision-making difficulties "lack of readiness" subscale items include statements regarding the current motivation to make a career decision, such as "I believe that I do not have to choose a career now because time will lead me to the 'right' career choice." Previous studies have highlighted the role of developmental stage in career decision-making difficulties. In a study by Gati, Saka, and Krausz (2001) examining career-decision making difficulties among young adults using CACGS, "lack of readiness" difficulties were found to be the highest among participants who were in the first stage of their career decision-making process of a three-stage career development model (i.e. pre-screening, in-depth exploration, and choice). This pre-screening stage describes individuals that are in the early stages of exploring a small number of occupation options (Gati & Asher, 2001). CIS may provide users with alternative career paths related to their own characteristics (i.e. career-related interests), however CIS may not address the lack of readiness among users in their early stages of choosing careers (i.e. first-year high school students). High school students typically are not making overt decisions regarding

their careers, thus it is expected that they would not be ready to make a decision, as suggested by the absence of change in the "lack of readiness" difficulties subscale scores among School A CIS treatment groups. These findings highlight the notion that pursuing career readiness or decidedness within a career intervention may not be developmentally appropriate for first-year high school students. Krieshok (1998) challenged the notion that career decidedness is a positive or desirable outcome, such that prematurely deciding on a career path may foreclose alternative options. Developing career decision-making skills and fostering self-exploration, rather than pursing specific career decisions, may be more beneficial across developmental stages and in particular, early in the career development process (Kreishok, 1998; Kreishok, 2001).

School B participants did not demonstrate significant changes in their vocational outcomes expectations, work hope, career planning, or career decision-making difficulties. This difference in career variable outcomes at each school may reflect the distinct applications of CIS at each site. Participants at School A completed the Interest Profiler, while Participants at School B completed additional modules, including the Interest Profiler, IDEAS, SKILLS, Reality Check, and Work Importance Locator modules. One possible explanation for the distinct findings in each school was that using multiple self-assessment modules in School B, compared to the one self-assessment module used in School A, complicated the process of matching the users' personal characteristics with corresponding career options. As previously discussed, CIS is guided by the Cognitive Information Processing model (CIP; Sampson, Peterson, Lenz, & Reardon, 1992), which emphasizes the importance of integrating knowledge of career options with one's own self-knowledge to make informed career decisions. School B

participants were provided information regarding their interests, values, lifestyle preferences, and skillsets through multiple CIS modules, which might have made it more difficult to integrate multiple aspects of self-knowledge with career options. Conversely, School A participants were only provided information regarding their interests, which may have facilitated the process of connecting their own characteristics with occupational options.

Another possible explanation for the distinct findings between schools was the use of the Reality Check module in School B. This module identifies potential discrepancies between the user's desired occupations and their lifestyle preferences (B. Rowe, CIS user services specialist, personal communication, December 5, 2016). As previously described, the Reality Check presents users with the required monthly income necessary to support their preferred lifestyle (e.g. housing preferences, transportation, and entertainment). Depending on the results of the Reality Check, the user may find that their desired occupations do not sustain their preferred lifestyles. If participants found that their desired occupations did not meet their preferred lifestyle, the participants would presumably be discouraged from pursuing their initial career goals.

Relatedly, work hope indicates that an individual has clear work-related goals that are guided by both agency and an understanding of the pathways (Juntunen & Wetterson, 2006), however, if individuals' career goals are disrupted by a mismatch in their preferred lifestyle derived from the Reality Check, their work hope may be impacted negatively or may fail to be enhanced by other modules of the intervention. Similarly, Social Cognitive Career theory defines outcome expectations as peoples' expectations about actually obtaining a satisfying and successful career that utilizes their own skills

(Lent et al., 1994). If the CIS users determine that their identified career interests, values, and skills and related occupations do not meet their lifestyle preferences, their expectations about obtaining a satisfying career may not improve. The vocational outcome expectations measure includes questions that closely relate to satisfaction with a chosen career, such as “My career/occupation choice will provide the income I need” or “My career/occupation choice will allow me to have the lifestyle that I want.” Thus, even if users identified potential career goals, their satisfaction with the selected career goals may be negatively impacted by the Reality Check. Given that only School B participants utilized the Reality Check, School A participants who did demonstrate higher vocational outcome expectations, work hope, and lower career decision-making difficulties may not have been exposed to the potential dissonance between their desired occupations and their lifestyle preferences.

Although the Reality Check module may impact potential career goals related to outcome expectations, the beliefs about one’s capability of completing specific tasks (i.e. vocational skills self-efficacy) would presumably not be effected by their career and lifestyle preferences. This is because, although related, self-efficacy and outcome expectations in a given domain are distinct (Lent, Brown, & Hackett, 1994; Lent, Brown, & Hackett, 2000). Vocational skills self-efficacy as measured in this study refers to participants’ beliefs in their capability of engaging in specific exploration and preparation tasks, while vocational outcome expectations refers to their beliefs about whether positive outcomes (e.g. jobs that utilize their skills) will occur in the future. The Reality Check identifies potential discrepancies between the user’s desired occupations and their lifestyle preferences, however this is unrelated to user’s capability of completed career-

related tasks (i.e. vocational skills self-efficacy). This provides a partial conceptual explanation for why vocational outcome expectations and work hope would be affected by the Reality Check, while vocational skills self-efficacy would not be affected.

School B treatment participants were also expected to demonstrate lower career decision-making difficulties across three domains at posttest relative to the control group: lack of readiness, lack of information, and inconsistent information. Contrary to my hypothesis, there were not group differences in the three career decision-making difficulties subscales at posttest. Both lack of information and inconsistent information difficulties decreased among School A treatment participants, thus it is possible that the differences in outcomes at the two schools are related to the different modules of CIS that were used. Specifically, the different modules utilized in School B, may have related to the non-significant findings in "lack of information" and "inconsistent information." Gati and colleagues (2001) posit that "inconsistent information" difficulties are related to unreliable information about the self and occupations as well as internal conflicts (e.g. contradictory preferences) and external conflicts (e.g. differing preferences of significant others). Each self-assessment module (i.e. Interest Profiler, IDEAS, SKILLS, and Work Importance Locator) provides users with occupations that match their own characteristics (i.e. interests, values, and skillsets). If participants are provided with occupations for each of the self-assessment modules that are distinct or unrelated, this may result in more internal conflicts (e.g. contradictory preferences) that present difficulties in their career decision-making. For example, users may find that their Interest Profiler module results match them with occupations in STEM fields, while their SKILLS module results match them with occupations in business management. Relatedly, if the Reality Check module

identifies a discrepancy between a preferred occupation and the lifestyle made available from the typical salary of that occupation, it might be challenging for the user to choose between their preferred occupations and their preferred lifestyle. The potential discrepancy in self-assessment modules at School B may provide an explanation for the non-significant findings in "lack of information" and "inconsistent information." As was found among School A treatment participants, "lack of readiness" difficulties did not decrease at posttest in School B treatment participants compared to control group participants. The similar results in both School A and School B (no changes in the difficulties associated with "lack of readiness") may reflect the developmental age of first-year high school students in career decision-making readiness.

It is also possible that the differences in findings at School A and School B were associated with other factors. Participants at School B had higher amounts of missing data on the final survey in the questionnaire, the career decision-making difficulties. Issues with the completion of survey measures may relate to the inconsistent findings in School B career decision-making difficulties. School B participants had a higher rate of missing data in the career decision-making difficulties subscales compared to all other scales as well as School A participants' career decision-making difficulties response rates. It is possible these results were impacted by participants' fatigue in completing the longer measure (i.e. 34 questions) at the tail end of the survey. School B participants were required to complete several more self-report assessment questionnaires as part of the CIS intervention (i.e. IDEAS, SKILLS, Work Importance Locator, and Reality Check), thus completing the questionnaire used in this study may have been associated with greater fatigue and may have resulted in fewer responses. Another important distinction

between School A and School B was the setting in which measures were collected. School B treatment participants were administered the CIS intervention in a first-year "house" course, while their survey measures were completed in the physical education course. School A treatment participants were administered the CIS intervention and completed the survey measures in a "health" course. It is possible that students were accustomed to completing written assignments in a health course, while less so in a physical health course, which may have influenced School B participants' focus on completed the survey measure. Additionally, the administration of CIS by school staff at each school may have been related to the different findings. The CIS intervention at School A was delivered by school counselors, while the CIS intervention at School B was delivered by teachers. Potential differences between teachers and school counselors may include the established relationships with students or in the different quality of the delivery of CIS to students. It is not possible to draw conclusions regarding the role of administrators in each school given that variables related to the administration of CIS were not measured in the current study, however it is necessary to note that these and other potential factors may have influenced the distinct findings at each school.

Hypothesis 2

The second hypothesis that the CIS treatment was expected to vary as a function of participants' race/ethnicity was not supported. The results of both School A and School B demonstrated that outcomes for White and Asian participants were not significantly different than for students of other racial/ethnic backgrounds with respect to vocational skills self-efficacy, outcome expectations, work hope, and career planning,

and career decision-making difficulties. The interaction between race/ethnicity and treatment group was also not significant in either School A or School B.

Previous studies have found that racial/ethnic backgrounds do not seem to contribute to differences in career aspirations or decision-making attitudes (Byars & McCubbin, 2001; Fouad & Byars-Winston, 2005; Fouad & Brown, 2000). Fouad & Byars-Winston (2005) found in a review of four studies (Lauver & Jones, 1991; Leung, Ivey, & Suzuki, 1994, Mau & Bikos, 2000; Tracey & Hopkins, 2001) examining the role of culture in career aspirations among high school and college students, that racial/ethnic backgrounds do not differ in regards to career aspirations. Likewise, Fouad & Byars-Winston (2005) found that racial/ethnic differences were not found in career-decision making or career exploration across four studies (Brown, Darden, Shelton, & Dipoto, 1999; Gloria & Hird, 1999; Lundberg, Osborne, & Miner, 1997; Powell & Luzzo, 1998). The current findings in both School A and School B indicate that students' use of CIS and career indicators (i.e. work hope, vocational outcome expectations, vocational skills self-efficacy, career planning, and career decision-making difficulties) were not significantly related to their self-reported racial/ethnic background. The majority of CACGS and career information sites are designed to be used across all subgroups, independent of potential subgroup differences (e.g. race/ethnicity, gender, SES, etc.) (Sampson & Osborn, 2015). Although CACGS, including CIS, are not designed to address potential differences in race/ethnicity or other populations, the current findings indicate that CIS was associated with positive changes in career indicator across both schools regardless of race/ethnicity. These findings are promising in the sense that CIS may have similar positive influences across racial and ethnic minority groups.

The persistent gaps in educational and vocational outcomes between White, Asian, and other ethnic minority groups (Fouad & Kantamneni, 2008; Juntunen, 2006; Oregon Department of Education, 2016; Trusty, Ng, & Plata, 2000) suggest that continued attention to career interventions that reduce these gaps are warranted. Ethnic minority group members have been found to perceive more barriers and fewer opportunities related to their career aspirations than White groups (Fouad & Byars-Winston, 2005). Relatedly, negative employment trends disproportionately impact ethnic minority populations. According to the U.S. Bureau of Labor Statistics (2017), Black/African-American and Latina/o groups also have higher unemployment rates compared to Asian and White groups. The current findings in School A and School B have positive implications for the use of CIS across racial and ethnic groups among specific career development variables, however, additional considerations regarding the needs of ethnic minority groups is warranted. For example, the current study combined racial and ethnic groups (i.e. Asian and White groups compared to all other racial and ethnic groups), given the smaller sample sizes among certain groups (i.e. Latino/a, Black/African-American, and American Indian/Alaskan Natives). Future studies should assess for differences in larger sample sizes that allow for separate testing of racial and ethnic subgroups to identify potential benefits or limitations of CACGSs among specific subgroups.

Hypothesis 3

The third hypothesis, that the effects of the CIS intervention would vary as a function of participants' SES, was not supported. As with race/ethnicity, the current findings indicate that CIS was associated with positive changes among career indicators

in both schools regardless of free and reduced lunch status. CIS users from various SES backgrounds have the same access to occupational information that matches their own career preferences. The self-assessment modules are intended to match students with occupations that match multiple preferences (i.e. interests, skills, and values) independent of financial resources. The information generated does not consider their families' financial resources or status. Previous studies have highlighted the role of explicit and implicit biases among instructors in regards to students' background and their subsequent educational achievement (Peterson, Rubie-Davies, Osbor, & Sibley, 2016; Van den Bergh, Denessen, Hornstra, Voeten, Holland 2010). Such biases may negatively influence the delivery of career interventions among different subgroups. For example, a teacher's implicit bias may garner recommendations for postsecondary activities that reflect assumptions about a student's intelligence or financial resources. A potential strength of CIS and other CACGSs is the absence of implicit biases in regards to results of self-assessments and available occupational information.

The classification of SES was determined using free and reduced lunch as an indicator, however it is possible that by using alternative indicators SES groups may have garnered different outcomes. Students from a household with an income at or below 185 percent of the national poverty line are eligible for free and reduced lunches, however SES encompasses a broader range of family characteristics (e.g. parental education, income, and occupations) (Snyder & Musu-Gillette, 2015). As such, parent's educational status was also utilized in the current study at School A and School B as an alternative indicator for SES for exploratory purposes, however no relationship between parent education and outcomes was found. Although analyses using these two SES indicators

yielded similar results, it is possible that using other SES indicators, such as parents' reported income and occupations, could yield different findings.

These findings may be promising such that CIS is associated with positive outcomes among first-year high school students across different SES groups. Such findings should not, however, be generalized to students of other developmental stages. In a study by McLaren (2013), SES was found to significantly moderate the relationship between the use of a CACGS and career decision-making self-efficacy among college students, such that lower SES students benefitted more CACGS when this intervention was received in conjunction with a career workshop. The role of SES may be more directly related to the career-decision making of college students, compared to early high school students. SES may not be directly or overtly impacting early high students' career development, such that a career intervention would be relevant or beneficial in addressing economic barriers to career decision-making. High school first-year students from lower SES backgrounds would not, for instance, be experiencing the financial costs of their education in the same way that college-level students would.

As previously described, Taber and Luzzo (1999) reviewed 26 studies examining the use of a CACGS and found that none of them explored the potential differences in effectiveness across socioeconomic groups. The current finding expands on the CACGS literature regarding socioeconomic groups such that there is preliminary support for the relationship between exposure to CIS modules, particularly the Interest Profiler and occupational information, and positive career outcomes among first-year high school students.

Hypothesis 4

The fourth hypothesis posited that the students exposed to the CIS treatment would have changes in their postsecondary education plans compared to the control group at posttest. This hypothesis was partially supported in School A, and was not supported in School B. At posttest, Treatment group participants in School A were more likely to indicate plans for specialized training, 2-year community college, or 4-year college instead of no education plans, compared to control group participants. Treatment group participants in School B were not more likely to demonstrate differences in their postsecondary education plans at posttest compared to control group participants. School A treatment participants demonstrated a greater likelihood of choosing any postsecondary education above no education plans compared to control group participants. The information provided by the CIS modules may have increased students' understanding of the academic requirements necessary to pursue their occupational goals, particularly among students that had previously considered not pursuing a postsecondary education. Students who were not considering pursuing a postsecondary education may have demonstrated a slight increase in their likelihood of choosing postsecondary education, given the presentation of new education information related to occupations. Although these findings demonstrate a positive relationship between CIS use and the likelihood of planning for postsecondary education, it is worth noting that the majority of students at School A were considering some kind of postsecondary education prior to the use of CIS. These findings may also relate to the non-significant findings in CIS treatment group participants in School B. Students may have already been considering pursuing some kind of postsecondary education, thus additional exposure to the education

requirements may not have been as relevant to students already planning on pursuing postsecondary educations.

Hypothesis 5

The fifth hypothesis was that students exposed to the CIS treatment would have more changes in their occupational interests at posttest relative to the controls, and this hypothesis was supported in both School A and School B. Treatment group participants in School A and School B were more likely to have changed their occupational interests at posttest compared to control group participants. CIS is designed to provide users with information regarding a range of occupations, and most users including first year high school students do not have pre-existing detailed knowledge about a wide range of occupations. Sampson and colleagues (1999) highlighted the importance of gaining knowledge of options that matches one's own self-knowledge to make informed decisions within the CIP model. The occupations presented at the completion of each CIS assessment (i.e. interests, values, and skillsets) serve as the options knowledge domain previously described in the Pyramid of Information (e.g. knowledge of specific industries and employment positions). Each of the self-assessments provides users with specific occupations as well as broad types of careers that may align with their identified interests, values, and skills. For example, the Interest profiler provides users with their Holland Code themes. Exposure to the themes and related occupations are designed increase one's knowledge about occupations that they would potentially find satisfying. The resulting occupations from the assessments may have broadened the potential options for School A and School B CIS treatment participants. Participants may have been exposed to new occupations that aligned with their own characteristics that they were not aware of prior

to the intervention. This increased knowledge of occupations may have resulted in participants selecting more preferable occupations at posttest than those previously selected at pretest.

Although the changes in occupations of interest among treatment participants may highlight increases in their occupational knowledge, this does not necessarily indicate that all participants' changes in occupations of interest reflect the identification of more desirable occupations. It is possible that participants gained a greater understanding of the potential challenges or barriers to pursuing previously identified occupations of interest, such as extensive educational requirements, financial burdens to education and licensure requirements, or discrepancies between their lifestyle preferences and the lifestyle afforded by a particular occupation. Participants who gained insights into the challenges of pursing their initial occupations of interest may have been dissuaded from pursuing their interests, and instead, selected occupations they thought were more attainable at posttest. It is not possible to determine from the present data whether changes in occupations of interest represented restriction rather than expansion of their options, or whether there are long-term drawbacks to some of these changes.

Practical Implications

The current findings provide initial support for the utility of a specific CACGS intervention in the career development of first-year high school students. As previously discussed, Brown and Krane's (2000) meta-analysis found that the most effective career interventions include written exercises, individualized interpretation and feedback, information about the world of work, role modeling, and building support. CACGS have the potential of providing some of these aspects of career interventions. Users can

independently utilize written exercises and gather information about the world of work through CIS. Additionally, career counselors or instructors can aid in providing individualized interpretations and feedback regarding CIS self-assessment results (i.e. Interest Profiler, SKILLS, IDEAS, Work Importance Locator). Additional studies of CACGSs support their utility as a stand-alone career counseling intervention, although they may be more effective when paired with additional counseling (Gati, Saka, & Krausz, 2001, Eveland, Conyne, & Blakney, 1998). Previous studies comparing the use of CACGSs with other career interventions demonstrate more effective career development outcomes when used in conjunction with career interventions such as group and individual counseling (Taber & Luzzo, 1999). CACGS, such as CIS, may be most effective when utilized in conjunction with other career development experiences such as career counseling or group counseling (Kapes, Borman, & Frazier, 1989; Fowkes & McWhirter, 2007, Tabe & Luzzo, 1999). In regards to the current study, CIS was administered by teachers and school counselors who provided guidance in regards to interpreting self-assessment results and the exploration of related career options. Although users are able to utilize CIS independently, the current findings provide support for the potential benefits of CIS in conjunction with career counseling support.

Given the differences in outcomes at the two different schools, utilization of different modules within CIS may garner different career-related outcomes. An important distinction between the administration of CIS in School A and School B was the use different career assessment modules to identify occupations pertinent to the user. School A participants completed only the Interest Profiler, while School B participants completed the SKILLS, Interest Profiler, IDEAS, Reality Check, and Work Importance

Locator modules of CIS. The differing results across schools may highlight the unique influences of each assessment within CIS. For example, the SKILLS assessment was utilized in School B, while it was not utilized in School A. School B treatment participants exposed to the SKILLS assessment demonstrated higher vocational skills self-efficacy compared to control participants, while School A treatment participants not exposed to SKILLS did not demonstrate significant differences in vocational skills self-efficacy compared to control participants. Along with the SKILLS assessment, School B participants were required to complete the Reality Check assessment. As noted earlier, I suspect that the Reality Check may provide information developmentally inconsistent with students' needs and raise discrepancies about their occupations of interest and lifestyle preferences. On the other hand, it could be that completing the Reality Check, while it did not reduce decision-making difficulties, might have been beneficial towards their career development. There may be positive outcomes not measured in the present study as a result of understanding more clearly the connection (or disconnection) between desired occupations and the participants' desired lifestyles. That being said, the Reality Check was only utilized in one school; thus it is not possible to make any definitive conclusions regards the benefits or barriers of this module. These findings highlight the need for practitioners and researchers to consider not only the use of CIS, but which specific modules are utilized and at which developmental stage. Future educational institutions using CIS, or comparable CACGSs, should consider the rationale for utilizing specific modules at various developmental ages

Recommendations for Future Research

The current findings provide initial support for two distinct applications of CIS among first-year high school students. Given the differences in outcomes at each school, further exploration of the effectiveness of distinct aspects of CIS is warranted. An area that might be particularly relevant to the current study would be utilization of the Reality Check module. As previously discussed, the Reality Check module provided users with information that may highlight discrepancies between their career goals and preferred lifestyle. This discrepancy, although potentially discouraging, may provide relevant and ultimately beneficial information regarding one's own career development. Relatedly, the application multiple self-assessment modules compared to one self-assessment module may garner different outcomes related to career decision-making. Future researchers should directly compare different applications of CIS in order to determine which specific iteration of CIS modules would be most beneficial. Some specific suggestions include adding additional outcome measures and longer-term follow-up to potentially capture benefits of the Reality Check module, and testing whether a combination of the Interest Profiler and SKILLS modules might generate changes across all of the outcome measures.

Along with the selection of modules, how CIS is delivered by administrators may be relevant. The CIS curriculum in School A was delivered by career counselors, while the CIS curriculum in School B was delivered by teachers. Multiple factors related to the administrators may have influenced the distinct findings in both schools. For example, teachers had more of an established relationship with participants, given that they instructed both the CIS curriculum and the regularly scheduled classes throughout the

semester. Alternatively, participants may have had limited or no previous relationships with the career counselors prior to the administration of the CIS curriculum. Additionally, career counselors may have had additional knowledge of career development compared to teachers, which may have aided in their administration of CIS curriculum. Given that these factors were not measured, it is not possible to draw conclusions about whether there were effects based on the roles of the administrators. Previous studies have highlighted the role of administrators in career counseling. Brown and Krane (2000) indicated that individualized interpretations and feedback by a counselor was among the five most important ingredients to effective career counseling. Previous studies have also highlighted the effectiveness of career counseling support in conjunction with CACGS interventions (Taber & Luzzo, 1999). Examining the role of the administrators of CIS may provide greater insight to the most effective applications of CACGSs. Accounting for the role of counselors, teachers, or school administrators in administering the intervention in the application of CACGS systems is necessary.

The current study examined the use of CIS among first-year high school students. Future researchers should assess for differences in CIS among users at different developmental stages. It is possible that CIS may produce different and more powerful outcomes for users who are actively making career and educational decisions, such as graduating high school students or college students. Another important consideration would be the long-term benefits of CIS and other CACGS among individuals making career decisions. The current study examined differences in career-related outcomes shortly after the utilization of CIS (i.e. two weeks), thus long-term outcomes cannot be

determined in the present study. Future researchers may benefit from assessing long-term outcomes following the use of CIS or other CACGSs.

As previously discussed, the current study combined racial and ethnic groups (i.e. Asian and White groups compared to all other racial and ethnic groups), given the smaller sample sizes among groups (i.e. Latino/a, Black/African-American, and American Indian/Alaskan Natives). Future studies may benefit from assessing differences in larger sample sizes that allow for separate testing of racial and ethnic subgroups to identify potential limitations or benefits of CACGSs among specific subgroups.

Limitations

Given the quasi-experimental nature of the current study, it is possible that factors not associated with the intervention contributed to posttest differences between treatment and control groups. It is possible that they differed systematically in some way unmeasured in this study. Quasi-experimental designs conducted in naturalistic settings are vulnerable to numerous threats to internal validity such as nonrandom assignment to groups, extraneous career-related learning experiences, and pre-existing factors not accounted for in the analyses. The current treatment and control samples, for example, were assigned to their conditions based on their participants' course schedules. The fall or spring registration to the courses in which CIS was delivered may have been impacted by extraneous factors, including scheduling requirements for other courses or extra-curricular activities. I controlled for some of these threats by: 1) testing proportion of missing data by gender, race/ethnicity, SES, and treatment conditions, 2) testing differences in prior CIS use between treatment and control groups, and 3) controlling for pretest differences using MANCOVA, however use of a randomized design would have

yielded stronger confidence that the present findings are associated with the respective CIS interventions. Differences in missing data are another limitation given that the data was not missing at random. Students receiving free and reduced lunch at School A were less likely to complete measures at pretest and posttest, while males at School B were less likely to complete measures at pretest. I controlled for these differences by imputing missing data and comparing the imputed and non-imputed results. Nonetheless, it is possible that differences in missing data contributed to the findings.

Another limitation for the current study were the relatively small effect sizes found across the significant findings in both School A and School B. Except for "inconsistent information" and "lack of information" at School A (which demonstrated medium effect sizes), all of the other significant career variables demonstrated small effect sizes at posttest. As such, the potential benefits of CIS demonstrated in the current study should be determined with caution.

As discussed in the future recommendations section, the current study also does not account for how CIS was administered by teachers and counselors. The flexibility of how CIS modules are administered means that there could be variations in how, for example, the Interest Profiler module is used among different teachers or counselors and these variations could be associated with differences in outcomes. Relatedly, an administrators' knowledge of CIS and skillsets for delivering CIS may influence the effectiveness of the intervention. Future research that attends to the specific administration of the modules would contribute to replicability of findings and clearer information about whether administration contributes to outcomes.

This study only examined the use of CIS modules among first-year high school students in a classroom setting. As such, the current findings should not be generalized to other users, such as those that are actively pursuing career development resources or high school students beyond their first year of high school. Replication and extension of this research to include different combinations of modules and different grade levels of participants is warranted.

Conclusion

This is the first known quasi-experimental study assessing group differences after one-week CIS interventions in high school settings. Bearing in mind the limitations of a quasi-experimental design, participants across both schools who utilized the CIS intervention demonstrated a number of significant and positive differences compared to control group participants at posttest. Treatment group participants in School A demonstrated higher work hope and vocational outcome expectations as well as lower career decision-making difficulties (specifically "lack of information" and "inconsistent information") compared to their counterparts in the control condition. Treatment group participants at School A were more likely to plan on specialized training, 2-year community college, or 4-year college instead of no education plans compared to control group participants. Treatment participants at School B demonstrated higher vocational skills self-efficacy compared to control participants at posttest when controlling for pretest differences. Lastly, treatment group participants at both School A and School B demonstrated more changes in their occupational interests at posttest compared to control group participants in each school. There were no differences found in career planning, vocational skills self-efficacy, or lack of readiness at School A between treatment and

control group participants. Moreover, there were no differences in outcome expectations, work hope, career planning, or career decision-making difficulties at School B between treatment and control group participants. Finally, findings did not differ as a function of racial/ethnic background (White/Asian compared with all other groups) or SES (free and reduced lunch recipients). These findings may be promising such that CIS is associated with positive outcomes among first-year high school students across different race/ethnic and SES groups.

The current findings provide initial support for the utility of a CACGS intervention, specifically CIS, among high school first-year students in classroom settings. Recommendations for future research include varying the CIS modules to which students are exposed, controlling for variation in administration of the modules, and administering the intervention to sophomore, junior, and senior high school students to further explore how CIS may be associated with positive changes at different stages of high school students' career development.

APPENDIX A

ASSENT FORM

Assent to Take Part in Research
Participant Assent

Career Information System Utilization and High School Students' Vocational Skills Self-Efficacy, Outcome Expectations, Work Hope, and Career Planning.

Name of Researcher: Eric Garcia
Counseling Psychology and Human Services
University of Oregon
UO IRB Protocol Number: [08142016.010]
High School:

Introduction:
You are being asked to take part in a research project that examines students' career development. This study is part of my coursework for my doctoral dissertation at the University of Oregon (UO). This research study is funded by the Alliance of Career Resources Professionals.

Why have I been asked to take part in the study?
- Because you are a freshman student enrolled in a high school that uses Career Information System (CIS).
- Because you might have an interest in reflecting on your career interests, exploration, and planning.

What do I do first?
- Before agreeing, please read this form.
- Please ask any questions that you may have.

What is the study about?
- Your career interests, exploration, and planning.

Who will take part in the study?
- About 800 freshman high school students in Oregon.

If I agree to take part, what will I be asked to do?
- Answer a survey for about 35 minutes, two times.
- If you do not wish to answer a question, you can choose to skip it.

What are the risks of being in the study?
- You may experience boredom or other negative feelings while answering some of the questions, but these are not likely to be different from feelings you experience on any school day.
- Loss of privacy and breach of confidentiality are risks associated with participation.
- Participation is voluntary and free, and you can decide to stop participating at any time with no penalty. Stopping participation will not affect your relationship with the school or with the researchers in any way.

What are the benefits of being in the study?
- You might enjoy answering the questions and thinking about your career planning.

How will things I say be kept private?
- I will not share your names with anyone and will keep these materials in a locked file.
- No individual student will be identified, no names will be used in any reports written about the findings.
- The surveys will be destroyed after 5 years.
- Access to the research records will be limited to the researchers.

What if I choose to not take part or stop the study?

- You will be asked to complete homework or an alternative class activity assigned by your teacher.
- You may stop answering the survey at any time.

Who can I contact if I have any questions?

- You can call Eric Garcia, who is the researcher in charge of this study. His number is 925-989-3670.
- If you have any questions about your rights as a person taking part in the study, you may call: Research Compliance Services at 541-345-2510 or email ResearchCompliance@uoregon.edu.

Statement of Consent:

Child Assent Form:

- I have read (or have had read to me) the contents of this assent form.
- I have been encouraged to ask questions.
- I have received answers to my questions.
- I give my assent to take part in this study.
- I have received (or will receive) a copy of this form.

Signature:

Study Participant (Print Name): _____

Participant Sign Here: _____ **Date:** _____

Please answer the following questions about yourself. These questions will be used to develop your Study ID:

1) Enter the ***FIRST TWO*** letters of your first name:			Example: "Eric" →	E R
2) Enter the ***DAY*** of the month you were born:			Example: "Jan 25th" →	2 5
3) Enter is the ***LAST TWO*** letters of your last name:			Example: "Garcia" →	I A

Combine your responses from 1-3 to create your Study ID code below (e.g., ER25IA):

Study ID:							**Example:**	E	R	2	5	I	A

APPENDIX B

DEMOGRAPHIC QUESIONNAIRE, POSTSECONDARY PLANS,

AND OCCUPATIONS OF INTEREST

Please answer the following questions about yourself. These questions will be used to develop your Study ID:

4) Enter the ***FIRST TWO*** letters of your first name:			Example: "Eric" →	E R
5) Enter the ***DAY*** of the month you were born:			Example: "Jan 25th" →	2 5
6) Enter is the ***LAST TWO*** letters of your last name:			Example: "Garcia" →	I A

Combine your responses from 1-3 to create your Study ID code below (e.g., ER25IA):

Study ID:							**Example:**	E	R	2	5	I	A

Section A.

The following questions ask for general information about you. Please respond to the items below by either indicating your response or selecting the one category that best represents you.

1) What is your current age? (*Check one*): ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17

2) What is your gender? (*Check one*): ☐ female ☐ male ☐ other:_____

3) What is your ethnicity? (*Check ALL that apply*):

- ☐ American Indian/Alaskan Native
- ☐ Asian/Pacific Islander
- ☐ Black/African-American
- ☐ Latino/a or Hispanic
- ☐ White/Caucasian
- ☐ Mixed race/ethnicity
- ☐ Other (please describe): _____

4) What are your PLANS immediately after high school? (*Check ALL that apply*):

- ☐ Work full time
- ☐ Work part time
- ☐ Not planning to work
- ☐ Enroll in 2 year/community
- ☐ Enroll in 4 year/bachelor degree program
- ☐ Enroll in specialized training, college program or apprenticeship program
- ☐ Enter military
- ☐ Other (please describe): _____

5) What is the highest level of education you would <u>LIKE</u> to obtain? (*Check one*):

- ☐ Less than High school Diploma
- ☐ High School Diploma
- ☐ 2 years of college or vocational school
- ☐ 4 year/bachelor degree
- ☐ Master's Degree
- ☐ Ph.D, M.D., or other Professional degree

6) What is the highest level of education you expect you will <u>ACTUALLY</u> obtain?(*Check one*):

- ☐ Less than High school Diploma
- ☐ High School Diploma
- ☐ 2 years of college or vocational school
- ☐ 4 year/bachelor degree
- ☐ Master's Degree
- ☐ Ph.D, M.D., or other Professional degree

7) Please indicate the highest education level of the parents/guardians who live in your household:

What is your Guardian #1's highest level of education completed? (*Check one*):

- ☐ Did not finish high school
- ☐ High-School graduate/GED
- ☐ Some college, did not finish
- ☐ Associates Degree or Technical Certificate
- ☐ Bachelor's Degree
- ☐ Graduate, Doctorate, or Professional Degree
- ☐ Unknown

What is your Guardian #2's highest level of education completed? Leave this blank if you have one guardian. (*Check one*):

- ☐ Did not finish high school
- ☐ High-School graduate/GED
- ☐ Some college, did not finish
- ☐ Associates Degree or Technical Certificate
- ☐ Bachelor's Degree
- ☐ Graduate, Doctorate, or Professional Degree
- ☐ Unknown

8) Do you receive free or reduced lunch? (*Check one*):

☐ Yes
☐ No

9) What are your grades, in general? (*Check one*):

☐ Mostly A's ☐ Mostly B's ☐ Mostly C's ☐ Mostly D's ☐ Mostly F's

10) What is your generational status? (*Check one*):

☐ I was born outside of the U.S.
☐ I was born in the U.S. and have at least one parent who is an immigrant.
☐ My parents and I were born in the U.S.

11) If you were NOT born in the U.S., how old were you when you came to the U.S.? _____

12) Please indicate what previous experiences you have had with Career Information System (CIS). Check "Yes" or "No" for each of the components. If "yes", how many times (approximately) you have used them:

IDEAS:	☐Yes	☐No	If yes, ___times
Interest Profiler:	☐Yes	☐No	If yes, ___times
SKILLS:	☐Yes	☐No	If yes, ___times
Work Importance Locator:	☐Yes	☐No	If yes, ___times
Reality Check:	☐Yes	☐No	If yes, ___times

13) How often do you plan to use CIS on your own time? (Circle one):

☐Never
☐Rarely
☐Sometimes
☐Often
☐Very Often

14) Name TWO occupations that you are currently most interested in pursuing:

a. _____

b. _____

(Be as specific as you can. For example, instead of "Business" say "Business – run my family's restaurant.")

APPENDIX C

VOCATIONAL SKILLS SELF-EFFICACY

Section B.

Directions: Please fill in the circle that best describes your confidence in your ability to do the following things. Use the scale below to rate yourself from "no confidence at all" to "complete confidence".

					Complete Confidence
				Much Confidence	
			Some Confidence		
		Little Confidence			
How confident are you that you can:	**No Confidence at All**				
1. State my general career interest (area of interest).	○	○	○	○	○
2. List four jobs in my general area of interest.	○	○	○	○	○
3. Find out the education requirements for a job.	○	○	○	○	○
4. Take responsibility for my education plans including my study habits.	○	○	○	○	○
5. Describe the basic interpersonal skills required for most jobs.	○	○	○	○	○
6. Understand the type of lifestyle associated with my career of interest.	○	○	○	○	○
7. Set and achieve short-term and long-term goals.	○	○	○	○	○
8. Make good decisions.	○	○	○	○	○
9. Choose high school courses that will prepare me for the future.	○	○	○	○	○
10. Find available options in a given decision-making situation.	○	○	○	○	○
11. State my career goals.	○	○	○	○	○
12. State my educational goals.	○	○	○	○	○
13. List three careers in my interest area that I could enter with a high school diploma.	○	○	○	○	○
14. List three careers in my interest area that I could enter with a 4-year college degree.	○	○	○	○	○
15. List three careers in my interest area that I could enter with a 2-year community college degree.	○	○	○	○	○
16. Find information about requirements for being a registered nurse.	○	○	○	○	○
17. Know where to find out the average salary for different jobs I'm interested in.	○	○	○	○	○
18. Know how to find out the future prospects (number of job openings, growth in an occupation) of a given occupation.	○	○	○	○	○

APPENDIX D

VOCATIONAL OUTCOME EXPECTATIONS

Section C.

Directions: Please respond to each question by marking how much you **agree or disagree** with each statement using the 4-point scale shown below:

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1. My career planning will lead to a satisfying career for me.	○	○	○	○
2. I will be successful in my chosen career/occupation.	○	○	○	○
3. The future looks bright for me.	○	○	○	○
4. My talents and skills will be used in my career/occupation.	○	○	○	○
5. I have control over my career decisions.	○	○	○	○
6. I can make my future a happy one.	○	○	○	○
7. I will get the job I want in my chosen career.	○	○	○	○
8. My career/occupation choice will provide the income I need.	○	○	○	○
9. I will have a career/occupation that is respected in our society.	○	○	○	○
10. I will achieve my career/occupational goals.	○	○	○	○
11. My family will approve of my career/occupation choice.	○	○	○	○
12. My career/occupation choice will allow me to have the lifestyle that I want.	○	○	○	○

APPENDIX E

WORK HOPE

Section D.

Directions: Carefully read the following statements and mark how much you **disagree or agree** with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly Agree
1. I have a plan for getting or maintaining a good job or career.	○	○	○	○	○	○	○
2. I don't believe I will be able to find a job I enjoy.	○	○	○	○	○	○	○
3. There are many ways to succeed at work.	○	○	○	○	○	○	○
4. I expect to do what I really want to do at work.	○	○	○	○	○	○	○
5. I doubt my ability to succeed at the things that are most important to me.	○	○	○	○	○	○	○
6. I can identify many ways to find a job that I would enjoy.	○	○	○	○	○	○	○
7. When I look into the future, I have a clear picture of what my work life will be like.	○	○	○	○	○	○	○
8. I am confident that things will work out for me in the future.	○	○	○	○	○	○	○
9. It is difficult to figure out how to find a good job.	○	○	○	○	○	○	○
10. My desire to stay in the community in which I live (or ultimately hope to live) makes it difficult for me to find work that I would enjoy.	○	○	○	○	○	○	○
11. I have the skills and attitude needed to find and keep a meaningful job.	○	○	○	○	○	○	○
12. I do not have the ability to go about getting what I want out of working life.	○	○	○	○	○	○	○

Section D continued.

Directions: Carefully read the following statements and mark how much you **disagree or agree** with each statement.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly Agree
13. I do not expect to find work that is personally satisfying.	○	○	○	○	○	○	○
14. I can do what it takes to get the specific work I choose.	○	○	○	○	○	○	○
15. My education did or will prepare me to get a good job.	○	○	○	○	○	○	○
16. I believe that I am capable of meeting the work-related goals I have set for myself.	○	○	○	○	○	○	○
17. I am capable of getting the training I need to do the job I want.	○	○	○	○	○	○	○
18. I doubt I will be successful at finding (or keeping) a meaningful job.	○	○	○	○	○	○	○
19. I know how to prepare for the kind of work I want to do.	○	○	○	○	○	○	○
20. I have goals related to work that are meaningful to me.	○	○	○	○	○	○	○
21. I am uncertain about my ability to reach my life goals.	○	○	○	○	○	○	○
22. I have a clear understanding of what it takes to be successful at work.	○	○	○	○	○	○	○
23. I have a difficult time identifying my own goals for the next five years.	○	○	○	○	○	○	○
24. I think I will end up doing what I really want to do at work.	○	○	○	○	○	○	○

APPENDIX F

CAREER PLANNING

Section E.

Directions: To what degree do you **disagree or agree** with the following statements?

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
1. I have or am planning to find out about educational and occupational possibilities by going to the library, surfing the web, or talking to somebody who knows.	○	○	○	○
2. I have or am planning to talk about career plans with an adult who knows something about me.	○	○	○	○
3. I am taking or plan to take classes which will help me decide what line of work to go into when I leave school or college.	○	○	○	○
4. I am taking or plan to take classes which will help me in college, in job training, or on the job.	○	○	○	○
5. I am taking or plan to take part in school or out-of-school activities which will help me in college, in training, or on the job.	○	○	○	○
6. I am taking or plan to take part in school or after-school activities (for example, science club, school newspaper, volunteer nurse's aide) which will help me decide what kind of work to go into when I leave school.	○	○	○	○
7. I am planning to get a part-time or summer job which will help me decide what kind of work I might go into.	○	○	○	○
8. I am planning to get money for college or for job training.	○	○	○	○
9. I am working out problems that might make it hard for me to get the kind of training or the kind of work I would like.	○	○	○	○
10. I plan to get the kind of training, education, or experience I will need to get the kind of work I would like.	○	○	○	○
11. I am giving a lot of thought about the kind of job I will get once I have finished my education and training.	○	○	○	○
12. I am doing things that will help me to be a good worker, one who is most likely to be sure of a job.	○	○	○	○

Section F.

The next questions concern the kind of work you would like to do when you complete your education. At this stage, you probably have not definitely decided on a specific occupation, but you probably can think of a field of work or type of job you would like to work at.

Directions: Keeping in mind the type of job you think you might like to be in after you finish your schooling, choose the one best answer which tells the amount of knowledge you already have about these jobs.

	A good deal of knowledge	**An average amount of knowledge**	**A little knowledge**	**No knowledge**
1. What people really do on the job.	○	○	○	○
2. The abilities needed for the occupation.	○	○	○	○
3. The working conditions on such jobs.	○	○	○	○
4. The education or training needed to get such a job.	○	○	○	○
5. The need for people on that kind of job in the future.	○	○	○	○
6. Different ways of getting into that occupation.	○	○	○	○
7. The chances of advancing in that kind of job or occupation.	○	○	○	○
8. What sort of working day and work week I might have in the occupation.	○	○	○	○

APPENDIX G

CAREER DECISION-MAKING DIFFICULTIES

Section G.

Have you considered what field you would like to major in or what occupation you would like to choose?

O Yes ONo

If so, to what extent are you confident of your choice? (Circle one):

Not confident at all O 1 O 2 O 3 O 4 O 5 O 6 O 7 O 8 O 9 Very confident

Directions: Please rate the degree to which each statement applies to you on the following scale. Circle 1 if the statement does not describe you at all, and 9 if it describes you very well. Of course, you may also circle any of the intermediate levels. Please do not skip any question.

For each statement, please circle the number which best describes you.	**Does not describe me** ---------- **Describes me well**								
1. I know that I have to choose a career, but I don't have the motivation to make the decision now ("I don't feel like it").	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
2. Work is not the most important thing in one's life and therefore the issue of choosing a career doesn't worry me much.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
3. I believe that I do not have to choose a career now because time will lead me to the "right" career choice.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
4. It is usually difficult for me to make decisions.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
5. I usually feel that I need confirmation and support for my decisions from a professional person or somebody else I trust.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
6. I am usually afraid of failure.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
7. I like to do things my own way.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
8. I expect that entering the career I choose will also solve my personal problems.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
9. I believe there is only one career that suits me.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
10. I expect that through the career I choose I will fulfill all my aspirations.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
11. I believe that a career choice is a one-time choice and a life-long commitment.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9
12. I always do what I am told to do, even if it goes against my own will.	O 1	O 2	O 3	O 4	O 5	O 6	O 7	O 8	O 9

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Section G continued.

For each statement, please circle the number which best describes you.	Does not describe me				----------				Describes me well
13. I find it difficult to make a career decision because I do not know what steps I have to take.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
14. I find it difficult to make a career decision because I do not know what factors to take into consideration.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
15. I find it difficult to make a career decision because I don't know how to combine the information I have about myself with the information I have about the different careers.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
16. I find it difficult to make a career decision because I still do not know which occupations interest me.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
17. I find it difficult to make a career decision because I am not sure about my career preferences yet (for example, what kind of a relationship I want with people, which working environment I prefer).	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
18. I find it difficult to make a career decision because I do not have enough information about my competencies (for example, numerical ability, verbal skills) and/or about my personality traits (for example, persistence, initiative, patience).	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
19. I find it difficult to make a career decision because I do not know what my abilities and/or personality traits will be like in the future.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
20. I find it difficult to make a career decision because I do not have enough information about the variety of occupations or training programs that exist.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
21. I find it difficult to make a career decision because I do not have enough information about the characteristics of the occupations and/or training programs that interest me (for example, the market demand, typical income, possibilities of advancement, or a training program's perquisites).	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
22. I find it difficult to make a career decision because I don't know what careers will look like in the future.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
23. I find it difficult to make a career decision because I do not know how to obtain additional information about myself (for example, about my abilities or my personality traits).	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
24. I find it difficult to make a career decision because I do not know how to obtain accurate and updated information about the existing occupations and training programs, or about their characteristics.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9

Section G continued.

For each statement, please circle the number which best describes you.	Does not describe me								Describes me well
25. I find it difficult to make a career decision because I constantly change my career preferences (for example, sometimes I want to be self-employed and sometimes I want to be an employee).	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
26. I find it difficult to make a career decision because I have contradictory data about my abilities and/or personality traits (for example, I believe I am patient with other people but others say I am impatient).	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
27. I find it difficult to make a career decision because I have contradictory data about the existence or the characteristics of a particular occupation or training program.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
28. I find it difficult to make a career decision because I'm equally attracted by a number of careers and it is difficult for me to choose among them.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
29. I find it difficult to make a career decision because I do not like any of the occupation or training programs to which I can be admitted.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
30. I find it difficult to make a career decision because the occupation I am interested in involves a certain characteristic that bothers me (for example, I am interested in medicine, but I do not want to study for so many years).	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
31. I find it difficult to make a career decision because my preferences cannot be combined in one career, and I do not want to give any of them up (e.g., I'd like to work as a free-lancer, but I also wish to have a steady income).	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
32. I find it difficult to make a career decision because my skills and abilities do not match those required by the occupation I am interested in.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
33. I find it difficult to make a career decision because people who are important to me (such as parents or friends) do not agree with the career options I am considering and/or the career characteristics I desire.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9
34. I find it difficult to make a career decision because there are contradictions between the recommendations made by different people who are important to me about the career that suits me, or about what career characteristics should guide my decisions.	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6	○ 7	○ 8	○ 9

Finally, how would you rate the degree of your difficulty in making a career decision? (Circle one):

Low ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 High

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