

# Internship Satisfaction Among University Students in Hong Kong during the COVID-19 Pandemic: Does Career Decision Self-Efficacy Mediate the Relationship Between Internship Satisfaction and Career Optimism?

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**Abstract:** Employing the framework of the social cognitive career theory, this study investigated the relationship between internship satisfaction and career optimism, as well as the mediating impact of career decision self-efficacy, considering two covariates: support from the workplace and university. Using data collected from a sample of engineering undergraduates at a university in Hong Kong (N = 140), the following two hypotheses were tested: 1) Internship satisfaction positively correlates with career optimism (H1), and 2) career decision self-efficacy mediates the positive relationship between internship satisfaction and career optimism (H2). The results revealed that career decision self-efficacy completely mediated the association between internship satisfaction and career optimism, with internship satisfaction alone significantly predicting career optimism. However, the covariates exerted only minimal impacts on career optimism. These results are important as they can provide human-resource and educational professionals, as well as other relevant stakeholders, with valuable insights into the relationship between internship satisfaction and its reported determinants.

## Introduction

The COVID-19 pandemic has substantially altered the internship landscape, potentially affecting students' career optimism. Despite this, its influence on internship-driven career development remains underexplored in the literature. Moreover, investigations on the specific mechanisms by which internship satisfaction may influence career optimism, particularly through the mediating role of career decision self-efficacy (CDSE), are limited.

To address these shortcomings, this study examines the correlations of the aforementioned variables among engineering

**Author's Note:** We affirm that all authors have made substantial contributions to this research and have read and approved this manuscript. The manuscript has not been previously submitted or accepted elsewhere. We also confirm that the study reported herein is entirely original, and no material submitted as part of the manuscript infringes existing copyrights or the rights of a third party. The authors declare no conflicts of interest and assert that this research received no specific funding.

undergraduates during the pandemic. Notably, establishing these relationships is particularly important in the Hong Kong context.

The primary purpose of this study is to investigate the relationship between internship satisfaction and career optimism among university students during the COVID-19 pandemic. In the remainder of this section, we provide general background information on internships, later focusing on internships in Hong Kong during the pandemic.

Initially emerging in the fields of medicine and nursing (Guyatt et al., 1992; Korman & Stubblefield, 1971), internships began gaining traction in various other fields such as accounting, engineering, and social work in the 1980s (Cord et al., 2010). With this, internships are now ubiquitous across various professional domains and are considered conventional forms of experiential learning. Although variably defined in the literature

(Stirling et al., 2014), an internship generally entails a term-length placement of a student within a company or an institution, with or without financial compensation (Narayan et al., 2010; Rogers et al., 2021). This placement may be supervised by an academic supervisor (Alpert et al., 2009) and/or an institutional company supervisor (Urquía-Grande & Pérez Estébanez, 2021) and often allows interns to earn school credits (Basow & Byrne, 1992).

Internships are commonly deemed essential for university students, as they allow prospective graduates to acquire vital work experience and develop practical skills before embarking on their desired career paths (Bayless, 1999; Clark, 2003, Knouse & Fontenot, 2008). Additionally, internships allow students to gain crucial insights into workplace cultures and gather essential information for future career planning (Renganathan et al., 2012; Weible, 2009; Youth Research Centre, 2020). A recent survey of 877 university undergraduates in Hong Kong (Youth Research Centre, 2020) revealed the following as major reasons for engaging in internships: gaining a better understanding of workplace cultures (51.9%), enhancing resumes (51.0%), applying theoretical knowledge in the workplace (44.7%), exploring career-development pathways, and expanding learning horizons (27.3%).

Ideally, internships are expected to provide students with valuable learning experiences, as well as opportunities to apply their theoretical knowledge to real-life scenarios. They are also anticipated to help students enhance their self-awareness, develop their interpersonal skills, explore their career interests, and deepen their understanding of their respective fields (To & Jane, 2020). Per existing research, the ideal internship is generally considered a learning experience that provides students with diverse opportunities for experiential learning, career exploration, networking, understanding workplace dynamics, developing communication skills and professional attitudes, and resume enrichment for future employment (Youth Research Centre, 2020). In practice, however, students may not always find internships fulfilling. For instance, in a

study examining the views of preservice teachers regarding internships, Lee et al. (2007) discovered that while some students effectively applied the necessary skills acquired from their internships, most remained neutral regarding their usefulness and reported lower levels of satisfaction.

In addition to benefitting students, at least in an ideal scenario, internships are also valuable to institutions and employers (Stirling et al., 2014), enabling them to boost their reputation, attract more scholarships and external funding, and establish networks with other institutions and organizations (Weible, 2009). Moreover, through internships, employers can screen and recruit young talents (Coco, 2000; Gerken et al., 2012), thus bringing state-of-the-art skills and knowledge to their workplace (Degraevet et al., 2012). Accordingly, several governmental initiatives have been implemented to promote internships. For instance, the Hong Kong Government has promoted internships (Hong Kong Special Administrative Region [HKSAR], 2021) by allocating additional funds (Innovation and Technology Commission, 2020).

In terms of its theoretical foundation, this study employs the social cognitive career theory (SCCT) (Brown & Lent, 2020; Lent et al., 1994; Lent & Brown, 1996)—a theoretical framework essential for human-resource departments, employers, and institutions to design high-quality internship programs. A prominent assertion of the SCCT is that the personal development of attributes such as self-efficacy and positive mindsets can be influenced by social and contextual variables surrounding one's professional, educational, and support experiences. Hence, this study investigates the presence of social cognitive variables such as career decision tendency (CDSE) and career optimism in the context of internship satisfaction. The study addresses the following two research questions: (1) What is the correlation between internship satisfaction and career optimism? (2) Does CDSE mediate the relationship between internship satisfaction and career optimism?

### Literature Review and Hypotheses Development

This section briefly reviews previous SCCT-related research, as well as the variables used in this study, namely internship satisfaction, career optimism, CDSE, and supervisor support during internships. Notably, examining these relationships within the context of Hong Kong is particularly important. Our choice of the SCCT was based on its proven applicability in supporting individuals in the initial stages of their careers (Olson, 2014). Previous studies have applied the SCCT to engineering students (Sheu et al., 2013; Inda et al., 2013; Carrico et al., 2012; Atadero et al., 2015).

#### Social Cognitive Career Theory

The SCCT is a theoretical framework that emphasizes how individuals exercise personal agency in their career development endeavors and focuses on certain extra-personal factors that bolster or inhibit this agency (Lent et al., 1994). A key assumption of the SCCT is that individuals can actively direct their life outcomes through experiential learning (Maddux, 1995). Specifically, life outcomes are generally assumed to be shaped through interactions among an individual's environment, personal factors, and choice behaviors. Furthermore, modifying self-efficacy beliefs is assumed to influence these interactions (Maddux, 1995). According to the SCCT, self-efficacy (personal factor), expectations (environmental factor), and personal goals (choice behavior factor) are interaction variables that can predict career behaviors (Lent et al., 1994; Lent & Brown, 1996; Brown & Lent, 2020).

Previous studies have extensively employed the SCCT to investigate career planning and development (Brown & Lent, 2020; Lease, 2006; Gushue & Whitson, 2006). Over the past two decades, the SCCT has been used to examine the influence of personal aspects (e.g., culture and gender) and socioeconomic factors on an individual's engagement in career-relevant learning experiences and choice options (Lent et al., 1994; Lent & Brown, 1996; Brown & Lent, 2020). Additionally, the

SCCT has been employed in studies examining career calling and career choices (Olson, 2014; Kaminsky & Behrend, 2015), as well as in those examining the subjective well-being of employees (Lee et al., 2021) and experiences of students with distance education (Taylan et al., 2022).

The SCCT has also proven valuable for evaluating early career experiences, including internships. For instance, Olson (2014) employed the SCCT to explore the self-efficacy, outcome expectations, and personal objectives of first-generation college students. Furthermore, in a study focusing on students' cultural factors (e.g., stereotype internalization, ethnic identity, values, parental impact, and perceived barriers), Kantamneni et al. (2018) discovered that the SCCT could offer insights into the career decision-making processes of racially diverse students. Overall, the SCCT has been applied across diverse occupations, including elite athletes (Demulier et al., 2013), hospitality workers (Wang, 2021), and preservice teachers (Braswell, 2000), making it a useful paradigm for the current study focusing on the internship experiences of university students.

#### Internship Satisfaction and its Predicting Factors

Previous studies define an internship in various ways: "a structured and career-related work experience before graduation" (Taylor, 1988, p. 1), "a form of experiential learning that integrates knowledge and theory learned in the classroom with practical application and skill development in a professional setting" (National Association of Colleges and Employers [NACE], 2018), and "a structured and guided pre-occupational program that allows higher education students to apply their skills and knowledge in real-life situations" (To & Lung, 2020, p. 543). In terms of remuneration, internships can be paid or unpaid (Rogers et al., 2021), while in terms of location or context, internships can require individuals to work from the office (Gündes & Atakul, 2017), outside the office (Fiori & Pearce, 2009), remotely from home (Ahmad, 2020), and virtually (Ruggiero & Boehm, 2016). In addition, internships can involve

supervision (Rose et al., 2014), no supervision (Shimahara & Sakai, 1992), credits (Beard & Morton, 1998), or no credits (Ciofalo, 1988).

Following the Innovation and Technology Commission STEM Internship Scheme guideline established by the selected local university, this study broadly defines an internship as a local or nonlocal full-time work placement (minimum three days/week) spanning at least four consecutive weeks (28 days) with/without remuneration and credits. Typically, internships can be conducted in the actual workplace, in a work-from-home setup, or through virtual or hybrid modalities. However, the tasks assigned during internships may not necessarily relate to the interns' university majors.

The primary focus of this study is internship satisfaction, a key variable related to internships, which is defined as “the extent to which interns perceive and feel about the different aspects of their internship program” (Hussien & La Lopa, 2018 p. 504). Notably, internship satisfaction is an umbrella concept that incorporates the overall internship experience of an intern, which is dictated by various factors such as their experience with assigned tasks, interactions with colleagues, company culture and microclimate, and the overall work environment. In this context, a previous study investigating the factors influencing internship satisfaction identified three groups: (1) job characteristics, (2) work environment, and (3) contextual factors (D’Abate et al., 2009). More specifically, the authors discovered that the factors influencing internship satisfaction included task significance, feedback, learning opportunities, supervisor support, and satisfaction with the organization. In a more recent study, To and Lung (2020) explored a different structural model predicting internship satisfaction using the following five factors: (1) supervisor support, (2) task clarity, (3) perceived functional value, (4) perceived social value, and (5) self-innovative behavior. Their findings identified supervisor support, directly and indirectly through perceived social value, as the strongest predictor of internship satisfaction. Other studies also suggest that

internship satisfaction is related to satisfaction with schooling (Chen et al., 2018) and positive learning experiences (positive learning experiences can enhance internship satisfaction (Daugherty et al., 1998)), as well as factors such as availability of university supervisor support, flexible working hours, feedback, academic readiness, and autonomy (Hussien & La Lopa, 2018). However, university supervisor support and work supervisor support have been consistently identified as the strongest predictors of internship satisfaction across several previous studies (D’Abate et al., 2009; To & Jane, 2020); hence, these predictors are used as covariates in the present study.

### **Career Optimism and its Predicting Factors**

Career optimism, as a vital personal asset for a successful career (Lin et al., 2022), is a central theme in positive psychology (Rottinghaus et al., 2005). Optimism is defined as a stable trait reflecting the degree to which individuals perceive their expected futures to be favorable and successful (Alacron et al., 2013); along similar lines, career optimism is defined as an individual’s tendency to expect the best possible outcomes or to focus on the most positive aspects of their future career development (Rottinghaus et al., 2005 p.11). Career optimism has also been previously reported to possess state characteristics (Luthans et al., 2007; Kluemper et al., 2009; Eva et al., 2020). Furthermore, previous studies have proposed that optimism is state-like and can be impacted and developed by other factors (Eva et al., 2020). Overall, career optimism has been argued to reflect an individual’s ability to adapt to their work environment and is influenced by multiple variables (Chui et al., 2022).

Previous studies have identified several factors that predict career optimism; these include various personality traits, academic or career choice satisfaction levels (Lin et al., 2022), and CDSE (Garcia et al., 2015; Chui et al., 2022).

Interestingly, numerous previous studies have highlighted the importance of various forms of support in fostering career optimism.

For instance, Garcia et al. (2015) discovered that teacher support boosted students' career optimism by enhancing their CDSE (Garcia et al., 2015). In another study focused on workplace settings, social support from peers and colleagues in the workplace was found to enhance career optimism by offering students increased learning opportunities (Friedman et al., 1998). Moreover, a recent systematic review on career optimism established perceived social support (teachers, parents, and networks) as a significant precursor to career optimism (Eva et al., 2020). Additionally, work supervisor support and university supervisor support have been found to positively correlate with internship satisfaction (Hussien & La Lopa 2018). Based on this evidence, the current study employs two forms of support during internships—work supervisor support and university supervisor support—as covariates.

### **Internship Satisfaction and Career Optimism**

To date, only limited studies have investigated the relationship between internship satisfaction and career optimism (e.g., Thompson et al., 2021, 2023; Garcia et al., 2015; Odio et al., 2014). Nevertheless, previous studies focusing on career choice, job satisfaction, and academic satisfaction offer some preliminary evidence in support of this relationship. For instance, reported evidence suggests that academic satisfaction and career choice satisfaction positively correlate with career optimism (Lin et al., 2022). Similarly, in a study examining employee engagement and its relationship with job satisfaction, Saks and Gruman (2014) discovered that engaged employees tend to experience higher levels of job satisfaction and feel more optimistic about their careers. Furthermore, Judge and Bono (2001) discovered positive correlations among core self-evaluations—encompassing emotional stability, locus of control, and generalized self-efficacy and self-esteem—and both job satisfaction and job performance, suggesting a link between positive self-evaluations and higher levels of career optimism. Finally, in a study investigating the role of hope, optimism, psychological capital,

resilience, and self-efficacy in combating employee stress and turnover, Avey et al. (2009) discovered that employees with greater psychological capital tend to experience higher job satisfaction and demonstrate more positive attitudes toward their careers. Collectively, these findings suggest that positive perceptions of work-related experiences are related to an optimistic mindset toward one's career. Accordingly, this study hypothesizes a positive correlation between internship satisfaction and career optimism.

### **Career Decision Self-Efficacy**

In addition to several individual and context-bound variables influencing individual learning experiences (Choi et al., 2012; Conklin et al., 2013), another variable that needs to be considered is CDSE, which is conventionally defined as the level of confidence an individual demonstrates in completing various tasks included in the career selection process (Bertz et al., 2012). Betz and Hackett (1981) originally considered CDSE to consist of both content and process domains, with the former referring to specific career fields and the latter indicating strategies used to navigate decision-making processes. Overall, individuals with higher CDSE are commonly assumed to be more likely to make reliable career decisions, leading to more positive career expectations. Indeed, in a previous study, self-efficacy has been reported to be an antecedent of career optimism (Eva et al., 2020).

Self-efficacy and outcome expectations eventually result in a specific goal level, interests, and career development performance, which are further affected by different contextual factors such as career barriers and social support (Choi et al., 2012). For instance, in a meta-analysis on the relationship between CDSE and various individual and contextual factors, such as gender, race, self-esteem, or career barriers, Choi et al (2012) discovered that CDSE significantly correlates with vocational identity, peer support, self-esteem, career indecision, and vocational outcome expectation. Furthermore, in a recent study investigating whether CDSE directly impacted

interns' intentions to remain in the same industry, Wang (2021) determined that internship satisfaction and career commitment mediated the relationship between interns' decision-making self-efficacy and intention to continue in the same industry (Wang, 2021). These results suggest that CDSE may mediate the relationship between internship satisfaction and career optimism.

**Conceptual Framework and Hypotheses**

Garcia et al. (2015) demonstrated that self-efficacy mediated the links between parent and teacher support and career optimism. However, the degree of internship satisfaction is yet to be linked to career optimism. Previous reports suggest that the development of CDSE relies on personal and contextual factors, which can impact the development of career optimism (Chui et al., 2022). As self-efficacy has been previously considered a mediator between other factors and career optimism, it was assumed to be a logical mediator in our model.

This study examined the impact of internship satisfaction (an independent variable) on career optimism (a dependent variable) while also considering the mediating role of CDSE (see Figure 1). As supervisor support has been previously linked to internship satisfaction, work supervisor support and university supervisor support were used as covariates (To & Jane, 2020); accordingly, we anticipated these factors to exert confounding effects on the outcome variables of our study. Using them as covariates also allowed us to isolate the unique contribution of internship satisfaction to the prediction of CDSE and career optimism.

The two hypotheses tested in this study are as follows:

H1: Internship satisfaction is positively correlated to career optimism.

H2: CDSE mediates the positive relationship between internship satisfaction and career optimism.

The conceptual model is depicted in Figure 1.

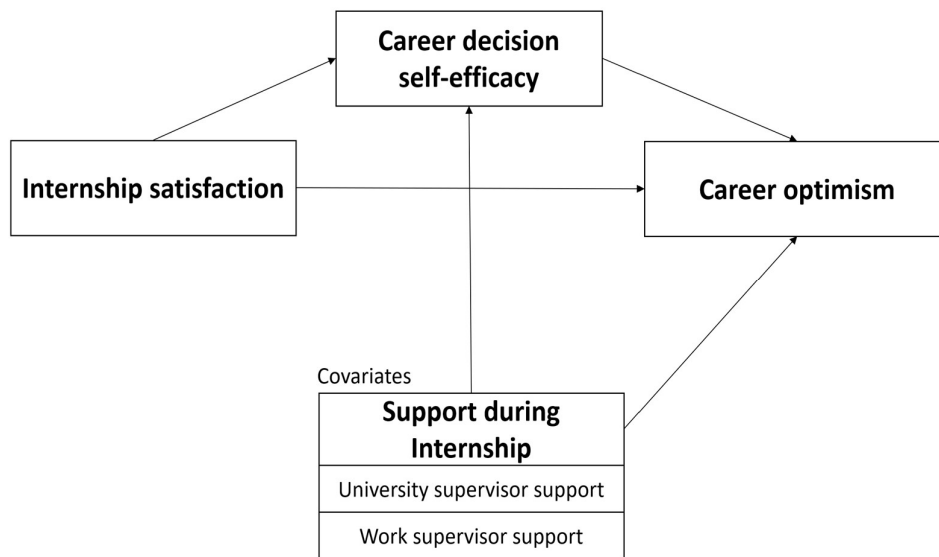


Figure 1  
*Theoretical Model*

**Pandemic Scenario of the Current Study**

In recent years, the field of internships has encountered significant challenges owing to the COVID-19 pandemic and its impact on the job market (Chue et al., 2022; Palitsky et al.,

2022; Wheeler & Waite, 2023). According to an estimate from the Youth Research Centre (2020), in the first quarter of 2020, the Joint Institutions Job Information System offered only 5,777 internship vacancies for university

students, representing a sharp drop of over 30% compared to the 8,468 internships offered during the same period in 2019. Despite this, academic research focusing on internships during the pandemic remains limited. Furthermore, the COVID-19 pandemic induced significant career shocks (e.g., stress, unemployment, and forced shifts in work modes, such as remote work and virtual offices) (Akkermans et al., 2020). However, as argued by Akkermans et al. (2020), such shocks could be mitigated by developing career competencies that foster career development and improve the employment prospects of young professionals, thereby increasing their resilience during difficult times.

Given the limited research focusing on the impact of the COVID-19 pandemic on internships and considering the existing evidence suggesting that the resilience of young professionals is mediated by career optimism (Souri & Hasanirad, 2011), this study focused on career optimism and its relationship with internship satisfaction among university students during the COVID-19 pandemic. Notably, our study data were collected during the pandemic; hence, the participants may have engaged in internships through various modes (e.g., in-person, online, or hybrid). Furthermore, as career shocks have been demonstrated to influence career decision-making processes (Seibert et al., 2013), conducting this research in the context of Hong Kong was particularly meaningful.

Building upon the foundational concepts of the SCCT presented in the introduction, our investigation explored the interplay of internship satisfaction, career optimism, and CDSE among engineering undergraduates in Hong Kong. The next section outlines the methodological framework used in our research to examine these relationships and their broader impact on career development.

## Methods

### Participants

In total, 141 undergraduates (age range: 20–22 years old) were recruited from the College of Engineering at a university in Hong Kong.

The majority of the participants (72.9%) identified as males, with nearly half (45.0%) being third-year students. Furthermore, a significant proportion of the respondents (81.4%) were nonlocal students. In terms of internship duration, almost half of the respondents (45%) had completed 2–3-month-long internships, while 32.9% had engaged in 1–2-month-long internships. In terms of supervision, 55% of the respondents were supervised by university staff, while 82.1% had supervisors at their workplace. Additional demographic information about the study participants is provided in Table 1.

### Measures

The analysis instruments were selected based on several criteria, which included the availability of evidence regarding their psychometric qualities, prior use in similar contexts (age group, geographical context), and length (to prevent discouraging participants from completing the survey and to maximize the sample size).

#### Internship Satisfaction

The degree of internship satisfaction was assessed using a three-item questionnaire previously proposed by Narayanan et al. (2010) and To and Jane (2020). The items were rated on a five-point scale (from 1 = “strongly disagree” to 5 = “strongly agree”). A sample item was “I am satisfied with the work I experienced in internship.” While previous research deemed the questionnaire to be reliable, with a Cronbach’s  $\alpha$  of 0.87 (Narayanan et al., 2010; To & Jane, 2020), it did not conclusively validate this instrument, as the scale was initially conceptualized as a formative instrument. In this study, however, the instrument demonstrated good reliability (Cronbach’s  $\alpha = 0.93$ ).

#### Work Supervisor Support

Work supervisor support was quantified as the degree of care expressed by the interns’ supervisors, as well as their ability to offer valuable and constructive feedback to enrich the experiences of the interns (To & Lung, 2020). Here, three items to be rated on a five-point Likert scale (from 1 = “strongly disagree” to 5 = “strongly agree”) were adapted from the work of Beenen (2007) and Wen (2010). A

sample item in this assessment was “My work supervisor gave me jobs and tasks that developed my skills” (To & Lung, 2020). Previous research has indicated good structural validity, as well as satisfactory convergent and discriminant validity, for this scale (To & Lung, 2020). The Cronbach’s alpha value of this construct has previously been reported as 0.83. In this study, the scale similarly demonstrated good reliability (Cronbach’s  $\alpha = 0.89$ ).

Table 1  
*Demographic Characteristics of the Sample (N = 140)*

| Variable                                   | Category                                | Number | %     |
|--|---|--------|-------|
| Gender                                     | Female                                  | 102    | 72.9% |
|  | Male                                    | 38     | 27.1% |
| Academic year during the internship        | Year 1                                  | 15     | 10.7% |
|  | Year 2                                  | 18     | 12.9% |
|  | Year 3                                  | 63     | 45.0% |
|  | Year 4                                  | 40     | 28.6% |
|  | > Year 4                                | 4      | 2.9%  |
| Student types                              | Local student                           | 26     | 18.6% |
|  | Nonlocal student                        | 114    | 81.4% |
| Department                                 | Advanced Design and Systems Engineering | 6      | 4.3%  |
|  | Architecture and Civil Engineering      | 27     | 19.3% |
|  | Biomedical Engineering                  | 8      | 5.7%  |
|  | Computer Science                        | 18     | 12.9% |
|  | Electrical Engineering                  | 47     | 33.6% |
|  | Materials Science and Engineering       | 8      | 5.7%  |
|  | Mechanical Engineering                  | 25     | 17.9% |
|  | Other                                   | 1      | 0.7%  |
| Mandatory requirement                      | Yes                                     | 23     | 16.4% |
|  | No                                      | 117    | 83.6% |
| Months of internship                       | 0–3 months                              | 111    | 79.3% |
|  | 4–7 months                              | 15     | 10.7% |
|  | 8–11 months                             | 2      | 1.4%  |
|  | > 12 months                             | 12     | 8.6%  |
| Average salaries                           | \$0–\$6,000                             | 20     | 14.3% |
|  | \$6,001–\$14,000                        | 116    | 82.9% |
|  | \$14,001–\$20,000                       | 2      | 1.43% |
|  | >\$20,000                               | 2      | 1.43% |
| University supervisor assignment           | No                                      | 63     | 45.0% |
|  | Yes                                     | 77     | 55.0% |
| Work supervisor assignment                 | No                                      | 25     | 17.9% |
|  | Yes                                     | 115    | 82.1% |
| Internship type                            | Noncredit-bearing internship            | 74     | 52.9% |
|  | Credit-bearing internship               | 66     | 47.1% |
| Job content related to academic discipline | No                                      | 12     | 8.6%  |
|  | Yes                                     | 128    | 91.4% |

**University Supervisor Support**  
University supervisor support was considered as the degree to which university supervisors supported the interns. In this case, six items to be rated on a five-point Likert scale (from 1 = “strongly disagree” to 5 = “strongly agree”) were adapted from the work of Hussien and La Lopa (2018) . A sample

item in this assessment was “My university supervisor was available critical times” (Hussien & La Lopa, 2018). Previous research has demonstrated this scale to have good structural validity, as well as satisfactory convergent and discriminant validity (Hussien & La Lopa, 2018). In this study, the scale



similarly demonstrated good reliability with a Cronbach's  $\alpha$  value of 0.94.

#### Career Decision Self-Efficacy

CDSE was evaluated using an eight-item scale adapted from the work of Ho and Sum (2018). The items were rated on a five-point scale (from 1 = "strongly disagree" to 5 = "strongly agree"). A sample item in this assessment was "I am able to decide what I value most when setting my educational and career goals." Per previous research, this scale exhibited sufficient construct validity based on positive relationships with career adaptability, general self-esteem, and career decidedness (Ho & Sum, 2018; Li et al., 2019). The Cronbach's alpha value of the construct reported in previous research was .88 (Chui et al., 2022). In this study, however, the scale demonstrated better reliability with a Cronbach's  $\alpha$  value of 0.93.

#### Career Optimism

Career optimism was assessed using a 11-item scale adapted from the work of Rottinghaus et al. (2005). The items were rated on a five-point scale (from 1 = "strongly disagree" to 5 = "strongly agree"). A sample item in this assessment was "I am eager to pursue my career dreams." Previous studies have reported good reliability for this scale (Cronbach's  $\alpha$  = .84, Rottinghaus et al., 2005). Moreover, per these studies, the scale also demonstrates good structural validity, as well as satisfactory convergent and discriminant validity (Rottinghaus et al. 2005). In this study, the instrument similarly presented good reliability with a Cronbach's  $\alpha$  value of 0.85).

#### Procedures

This study was approved by the Human Subjects Ethics Committee of the Department of Social and Behavioral Sciences (Reference: SS4708-2022-56). The study data were collected using the convenience sampling approach through an online questionnaire administered via QuestionPro from December 19, 2022, to January 22, 2023. After seeking approval from the Co-operative Education Centre of the College of Engineering at a local university, we acquired a contact list of engineering students who had completed their internship during the COVID-19 pandemic to

recruit them as participants. Subsequently, an invitation email detailing the objective of the survey was sent to these students, requesting their voluntary participation in the survey. The participants were assured of the confidentiality of their data, and electronic informed consent was obtained. The participants were also allowed to print or save a copy of their responses for future reference. In total, 197 students were contacted, and of these, 141 students completed the survey. In the subsequent data filtering, one record was, however, excluded as the participant did not respond with a "yes" to a checking question. Therefore, 140 valid responses were obtained in total (response rate 71%).

Given that English is the medium of instruction at all universities in Hong Kong, all participants were proficient in answering the questionnaire in English. Completing the questionnaire typically took 20 min. The responses were submitted anonymously, and individual participants were not identifiable. The data collection and research tasks were not outsourced or subcontracted to any third party, and no briefing/debriefing was required.

#### Data Analysis

Descriptive analyses were performed using IBM SPSS Statistic, version 28. A mediation analysis was conducted using the macro in SPSS 28 (Hayes, 2023). Based on the mediation analysis criteria proposed by Kenny et al. (1998), for each mediation analysis, we ensured the following: (1) The independent variable predicted the dependent variable (total effect). (2) The mediator predicted the dependent variable while controlling for the independent variable. (3) The independent variable predicted the mediator. In all cases, the covariates were controlled for. The corresponding effects are reported in the Results section, along with the description of a corresponding test on the indirect effect of the independent variable on the dependent variable through the mediator, which was conducted using bootstrapping.

#### Data Screening

The data were initially screened for appropriate features including missing data,

outliers, and normality. However, missing data were not expected, as all fields in the questionnaire were mandatory. As expected, no missing data were found in the main measures. The survey also included a checking question: “Please select ‘Yes’ for this question.” The Mahalanobis distance was computed for all predictor variables. Among the main predictor variables, internship satisfaction and CDSE, only 1% of the data were identified as multivariate outliers. However, the data corresponding to these outliers were retained because the outliers constituted a very small proportion of the overall dataset. Moreover, no problematic collinearity was detected.

**Results**

**Descriptive Statistics**

Descriptive statistics for the predictor variables (internship satisfaction and CDSE) and the dependent variable (career optimism)

are summarized in Table 2. Most of the respondents reported mean ratings above three for each variable (85.6% for internship satisfaction, 90.7% for CDSE, and 60% for career optimism). For internship satisfaction, 69.2% reported mean scores equal to or above four, and 53.5% reported CDSE mean scores equal to or above four. For career optimism, 16.5% reported scores over 1 standard deviation above the mean. Collectively, these descriptive statistics indicated that the respondents had mostly positive internship experiences, higher levels of CDSE, and positive levels of career optimism.

Work supervisor support and university supervisor support, which were selected as covariates, were dummy-coded to indicate whether interns had either type of support during their reported internships. Overall, 82% of the participants reported having work

Table 1  
*Descriptive Statistics of the Variables*

| Variables                         | N       | M        | M  | M        | SD  | r    |
|-----------------------------------|---------|----------|----|----------|-----|------|
|                                   |         | in       | ax |          |     |      |
| Career Optimism                   | 1<br>40 | 1.<br>91 | 5  | 3.<br>22 | .61 | -    |
| Internship Satisfaction           | 1<br>40 | 1.<br>00 | 5  | 3.<br>95 | .91 | .29* |
| Career Decision Self-<br>efficacy | 1<br>40 | 1.<br>00 | 5  | 3.<br>88 | .70 | .62* |
| Work Supervisor Support           | 1<br>40 | .0<br>0  | 1  | .8<br>2  | .38 | .09  |
| University Supervisor<br>Support  | 1<br>40 | .0<br>0  | 1  | .5<br>5  | .50 | -.06 |

*Note.* A composite score for each measure was each participant’s mean response rating, and *M* is the mean of the composite scores. Zero order correlations, *r*, are between the listed variable and Career Optimism (CO). Relationships between Work Supervisor Support and CO and between University Supervisor Support and CO were not significant. \*significant at *p* < .001

supervisor support, while 55% reported having university supervisor support. This indicated that most internship participants had some level of support during their internship experience.

**Regression with Mediation Analysis**

To test the hypotheses, multiple regression with mediation analysis was performed using PROCESS Model 4. Before conducting the regression with mediation, multicollinearity

statistics were tabulated, and the results indicated that none of the predictors or covariates displayed multicollinearity. The coefficients and statistics from the regression analyses conducted to test mediation effects are summarized in Table 3.

**Table 3**  
*Mediation Analysis: Effect of Internship Satisfaction and Career Decision Self-Efficacy on Career Optimism*

| Variable                            | B    | SE  | β    | t     | p     | 95% CI for B |      |     | R <sup>2</sup> <sub>adj</sub> |
|-------------------------------------|------|-----|------|-------|-------|--------------|------|-----|-------------------------------|
|                                     |      |     |      |       |       | LL           | UL   | R   |                               |
| Total Effect (Model C)              |      |     |      |       |       |              |      |     |                               |
| Constant                            | 2.44 | .23 |      | 10.78 | <.001 | 1.99         | 2.89 |     |                               |
| IS                                  | .20  | .06 | .30  | 3.58  | <.001 | .09          | .31  | .32 | .08                           |
| WSS                                 | .10  | .14 | .06  | .72   | .48   | -.18         | .38  |     |                               |
| USS                                 | -.18 | .11 | -.15 | -1.68 | .10   | -.39         | .03  |     |                               |
| IS to CDSE (Model A)                |      |     |      |       |       |              |      |     |                               |
| Constant                            | 2.57 | .25 |      | 10.43 | <.001 | 2.08         | 3.05 |     |                               |
| IS                                  | .34  | .06 | .44  | 5.54  | <.001 | .22          | .46  |     |                               |
| WSS                                 | -.08 | .15 | -.04 | -.52  | .60   | -.38         | .22  |     |                               |
| USS                                 | .07  | .12 | .05  | .61   | .55   | -.16         | .30  |     |                               |
| IS and CDSE to CO (Models B and C') |      |     |      |       |       |              |      |     |                               |
| Constant                            | 1.06 | .25 |      | 4.30  | <.001 | .57          | 1.55 |     |                               |
| IS                                  | .02  | .05 | .03  | .39   | .70   | -.08         | .12  |     |                               |
| CDSE                                | .54  | .06 | .62  | 8.35  | <.001 | .41          | .66  |     |                               |
| WSS                                 | .14  | .12 | .09  | 1.25  | .21   | -.08         | .37  |     |                               |
| USS                                 | -.22 | .09 | -.18 | -2.49 | .01   | -.39         | -.04 |     |                               |

Note: IS = Internship Satisfaction; WSS = Work Supervisor Support; USS = University Supervisor Support; CDSE = career decision self-efficacy. Model C was the total effect model with career optimism (CO) as the dependent variable. CDSE was the dependent variable in Model A, CO was the dependent variable in Model B, and C was the dependent variable in Model C'.

The total effect regression model (which included work supervisor support and university supervisor support as covariates) was a significant predictor of career optimism, with  $F(3, 139) = 5.12, p = .002$ . In support of H1, internship satisfaction was a significant predictor of career optimism, with  $B = .20, p < .001$ . Neither work supervisor support nor university supervisor support was identified as a significant predictor in this model.

The regression model with internship satisfaction, work supervisor support, and university supervisor support was a significant multivariate predictor of CDSE, with  $F(3, 139) = 11.26, p < .001$ . Moreover, internship satisfaction was a significant predictor of CDSE, with  $B = .34, p < .001$ . By contrast, neither type of supervisor support was a significant predictor in this model.

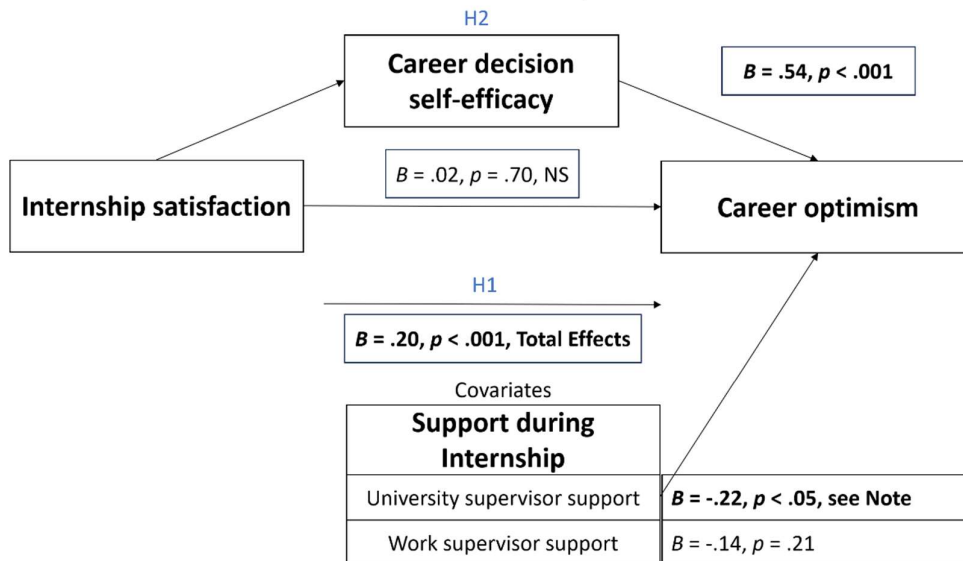
The direct effect regression model with internship satisfaction, CDSE, work supervisor support, and university supervisor support was a significant predictor of career optimism, with  $F(4, 139) = 23.19, p < .001$ . The mediator, CDSE, was also a significant predictor of career optimism, with  $B = .54, p < .001$ . Additionally, university supervisor support was a significant predictor of career optimism, with  $B = -.22, p = .014$ , whereas work supervisor support was not. Interestingly, internship satisfaction was not a significant predictor of career optimism in this model.

The mediation model was evaluated using the Sobel test. Notably, the mediation analysis was significant, with  $t = 4.61, SE = .040$ , and  $p < .001$ , supporting H2. The mediation effect

was also tested using bootstrap analysis. With a bootstrap confidence interval that was entirely above zero (0.0883 to 0.2968 in the following output under the headings “BootLLCI” and “BootULCI”), the mediation was found to be significant. The mediation model, with the results, is depicted in Figure 2. A full mediation effect of CDSE on the relationship between internship satisfaction and career optimism was demonstrated, as evidenced by the significant correlation between internship satisfaction and career optimism in the total effect model but not in the direct effect model.

We also established (using PROCESS Model 6) a serial mediation model to test whether the support variables influenced optimism mediated by (sequentially) internship satisfaction and CDSE. Consequently, we discovered a significant double-mediated effect of university supervisor support on career optimism through internship satisfaction and CDSE, controlling for covariate work supervisor support, with  $B = -.22, p < .05$ .

Figure 2  
Mediation Model with Results for Each Model Path



*Note.* Significant results are shown in bold. The reduced effect of internship satisfaction on career optimism in the mediation model as compared to the Total Effects model is the expected result demonstrating the full mediation effect of career decision self-efficacy on career optimism. University supervisor support was significant only when all predictors were included in the Direct Effects model.

## Conclusion

### Summary

Given the lack of research on internship satisfaction during the COVID-19 pandemic, this study aimed to fill the void by investigating the relationship between internship satisfaction and career optimism, as well as the mediating effect of CDSE on this relationship, considering workplace and university supervisor support as covariates. Interestingly, the two hypotheses tested in the present study—internship satisfaction positively correlates with career optimism (H1), and CDSE mediates the positive relationship between internship satisfaction and career optimism (H2)—were entirely supported by the results.

First, in support of H1, the results revealed a positive correlation between internship satisfaction and career optimism, suggesting that a higher level of internship satisfaction results in higher career optimism. This finding is consistent with previously reported results in the realm of job performance and satisfaction. For instance, Judge and Bono (2001) discovered that positive self-evaluations, including self-esteem, generalized self-efficacy, locus of control, and emotional stability, are positively related to job satisfaction and job performance, suggesting a link between positive self-evaluations and higher levels of career optimism. Similarly, in a study on employee engagement and its relationship with job satisfaction, Saks and Gruman (2014) discovered that engaged employees were more likely to experience higher levels of job satisfaction and remain more optimistic about their careers.

Second, substantiating H2, the results reveal that CDSE completely mediates the relationship between internship satisfaction and career optimism. This finding aligns with previous evidence suggesting that internship satisfaction affects CDSE (Ramaprasad et al., 2022). Indeed, during internships, students acquire first-hand experience that can broaden their horizons and enable them to make informed choices about their future careers or

the skills required to succeed in those careers (Sargent & Domberger, 2007). Expanding upon previous research (e.g., Eva et al., 2020), the results convincingly demonstrate that CDSE is a significant antecedent of career optimism. Our findings further corroborate the assertion of the SCCT, which states that as a learning experience, internships can enhance self-efficacy, ultimately fostering the development of career optimism.

However, contrary to previously reported findings suggesting that university and/or work supervisor support can predict internship satisfaction (e.g., To & Jane, 2020; D'Abate et al., 2009), these forms of support were found to be insignificant in our linear regression analysis. Similarly, per the mediation model, work supervisor support proved insignificant, whereas university supervisor support proved significant but in the opposite direction (i.e., with a negative impact on career optimism). This inconsistency between the current findings and previously reported results can be attributed to differences in internship modalities. Notably, during the COVID-19 pandemic, the participants of this study engaged in diverse internship modes, ranging from physical presence in the workplace to various alternative forms, such as remote work, hybrid arrangements, or virtual internships. Consequently, the quality of remote internship supervision could have adversely affected the participants' internship experiences.

### Practical Implications

The results of this study have crucial practical implications for the internship domain. Specifically, the discovery that CDSE entirely mediates the relationship between internship satisfaction and career optimism suggests that relevant measures, such as counseling sessions and facilitator-led discussion sessions on occupation topics and career choices, could be undertaken to enhance the CDSE of would-be interns (Falco & Summers, 2019). Similarly, previous evidence indicating that character strengths, such as optimism, gratitude, and hope, contribute to better work outcomes, including job satisfaction and overall well-being (Peterson & Park, 2006), suggests that these

strengths can be cultivated to enhance interns' career prospects and optimism. More specifically, universities can design targeted pre-attachment workshops and training sessions aimed at developing students' CDSE. In these endeavors, universities can seek guidance from past intervention programs with proven effectiveness, such as a program for adolescent girls (Falco & Summers, 2019) or a CDSE intervention program proven to mitigate career indecision (Lam & Santos, 2018).

### **Limitations and Future Research**

#### **Directions**

In addition to its accomplishments, this study has several limitations. All participants were exclusively recruited from the College of Engineering at a university in Hong Kong, thus limiting the generalizability of the results. Accordingly, future research must consider recruiting students majoring in other disciplines as participants. Additionally, due to variations in the assignment of workplaces or university supervisors, the sample sizes differed between the two conditions. Owing to this imbalance, only the supervisor assignment (bivariate) instead of the composite score was utilized. Accordingly, to compare the effect of different types of supervisor support in further research, a larger sample size must be considered. Moreover, because 83.6% of the study participants did not mandatorily have to engage in internships, the samples considered in this study may not be representative of the general student population. Furthermore, students who voluntarily participated in internships may possess specific personality traits and academic profiles (e.g., higher academic achievements, greater perseverance, or resourcefulness) that may have biased the results, primarily because these variables would likely be related to the predictor, mediator, and outcome variables. Unfortunately, the subgroup of students who were required to participate in internships was too small to be analyzed separately. Thus, considering the risk of possible self-selection bias, we recommend replicating this study in contexts where internships are mandatory. The current study focused only on support from

university supervisors and/or work supervisors while omitting peer support as a possible covariate, thus necessitating further research on the potential impact of this factor. Moreover, the mode of internship participation among students was ignored. Accordingly, future research can focus on the possible impact of internship participation on internship satisfaction, CDSE, and career optimism. Furthermore, because the correlations observed among the core variables in this study were prevalent during the pandemic, future research can ascertain whether these correlations hold under normal conditions.

Finally, the sample size was insufficient to account for measurement effects through latent mediation models (i.e., mediation using latent variables). Therefore, future research involving larger sample sizes could offer better estimations of the effects investigated in the present study.

#### **Conclusion**

This study presents a comprehensive model to explore the relationship between internship satisfaction and career optimism, along with the mediating effect of CDSE on this relationship, considering supervisor support (workplace and university) as covariates. From a practical viewpoint, our results suggest that by introducing career intervention programs aimed at enhancing students' CDSE, educators and career counselors can guide students toward success in their future career endeavors. The significance of our results is additionally underscored by the scarcity of previous research on internship satisfaction during the COVID-19 pandemic. Exploring internship satisfaction during the pandemic is particularly important because of the emergence of new internship modalities, such as remote or virtual internships, all of which have necessitated changes in how universities have prepared their students for internships and subsequent professional achievements.

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