Planned Happenstance Skills and College Students with Disabilities

By
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Abstract

College students who are transitioning from higher education to employment encounter a variety of life events (i.e., happenstances), both planned and unplanned. These happenstances can influence their career development in both positive and negative ways. It is important for college students to possess skills that equip them to recognize, create, and utilize their happenstances in their career development process (i.e., planned happenstance skills [PHS]). There are multiple studies examining the relationship between PHS and other career-related constructs (e.g., occupational engagement, career decision-making self-efficacy) and college students’ characteristics (e.g., year of study, gender). However, to date, there are no studies examining the PHS of college students with disabilities and its relationship with other career-related constructs. This dissertation presents a collection of studies investigating the assessment and measurement of PHS among college students with disabilities. Across the chapters, I present: (a) an introduction to PHS in the career development process of college students with disabilities (Chapter 1), (b) evidence for the validity and reliability of the instruments measuring PHS and occupational engagement among college students with disabilities (Chapter 2), (c) evaluation of differences in college students’ PHS based on disability status (Chapter 3), (d) relationship between PHS and occupational engagement among college students with disabilities (Chapter 4), and (e) a conclusion synthesizing the findings across the three studies and identifying implications for research and practice (Chapter 5).
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Chapter 1: Introduction

“What-you-should-be-when-you-grow-up need not and should not be planned in advance” (Krumboltz, 2009, p. 135). Career development is not a linear, pre-destined path but rather developed through a variety of personal experiences by both planned and unplanned events, often called happenstances. Planned happenstance skills (PHS) refer to a set of skills that people need to develop to benefit from happenstance opportunities that are available to them (Mitchell et al., 1999). PHS are especially important for youth and young adults as they embark upon their adult work life and career path.

Having PHS empowers youth and young adults to identify positive happenstances and use them as meaningful learning opportunities. Much of the scholarship in PHS has focused on college students. College students with higher PHS have stronger career engagement and higher career decision-making self-efficacy (Kim, Jang, et al., 2014). Up to now, college students with disabilities have not been the focus of researchers investigating happenstance opportunities or PHS. In a perspective article where the impact of happenstance was considered in regard to the career paths of youth with disability, Rojewski (1999) concluded that that youth with disabilities were at risk of not having the same quantity or quality of opportunities for positive happenances as peers without disabilities. Rojewski’s observations (1999), as well as findings from the National Longitudinal Transition Study-2 (NLTS-2; Lee et al., 2016; Liu et al., 2018) that consistently show poor employment outcomes for young adults with disabilities, provide a strong rationale for investigating the extent to which college students with disabilities have developed PHS and are prepared to take advantage of happenstances when opportunities arise.
Happenstances in Career Development

Studies have presented evidence that people’s career paths are influenced by unplanned events (Betsworth & Hansen, 1996; Bright et al., 2006; Guindon & Hanna, 2002). Betsworth and Hansen surveyed adults aged between 52 and 88 to explore what participants identified as unplanned events that significantly influenced their career. Bright et al. surveyed high-school and university students to investigate what factors influenced their career decision-making. The majority of participants in both studies (Betsworth & Hansen, 1996; Bright et al., 2006) identified unplanned events as a significant factor, including personal or professional connections, previous work or social experiences, unintended exposures to an area of interests and disinterests, and a barrier to original plans.

Krumboltz (1996, 2009) developed the happenstance learning theory (HLT) to explain how people navigate through innumerable unplanned and unpredictable events, which can provide opportunities for learning. In the career counseling field, the HLT framework encourages practitioners to assist clients to recognize, generate, and incorporate unplanned events into their career development. Youth and young adults should anticipate and utilize happenstances for positive outcomes, including knowledge, interests, skills, preferences, beliefs, sensitivities, emotions, and future actions.

Two major implications of Krumboltz’s (1996) HLT are that youth and young adults are encouraged to: (a) generate happenstances and opportunities through exploratory activities to increase their quality of life, and (b) develop skills to utilize happenstances in career development, which are PHS. Specifically, PHS consists of five dimensions: (a) curiosity - exploring new learning opportunities; (b) persistence - exerting ongoing effort despite setbacks; (c) optimism - viewing new opportunities as possible and attainable; (d) flexibility - adapting to
changing attitudes and circumstances; and (e) risk-taking - taking actions in the face of uncertainty (Mitchell et al., 1999). Strong PHS prepare youth and young adults to actively seek activities or information that may lead to happenstances beneficial to their career development and future lives.

Happenstances for Youth and Young Adults with Disabilities

Happenstances can influence one’s life negatively or positively. In a conceptual paper, Rojewski (1999) argued that young people with disabilities are at risk of being negatively influenced by their happenstances. Different external factors surrounding youth and young adults with disabilities may explain why their happenstances are more likely to have negative influences.

First, one happenstance that was reported as salient in shaping one’s career path is encouragement from mentors (Williams et al., 1998), such as receiving suggestions from teachers to apply for a certain job or educational program. In other words, teacher expectations may lead to the encouragement that creates positive happenstances. Unfortunately, teacher expectations for far too many students with disabilities have been found limiting (Holwerda et al., 2015; Trainor et al., 2008). Similarly, studies show that many family members have low expectations regarding career outcomes for their child with disabilities, expressing that segregated employment (e.g., sheltered workshops) as the best or only career option (Blacher et al., 2010; Grigal & Neubert, 2004; Powers et al., 2009).

Second, people in the general population encounter happenstances through work or social experiences (Betsworth & Hansen, 1996). Youth and young adults with disabilities also have limited exposure to this type of happenstances. A majority of secondary schools were reported not to offer school-to-work education and employability skills instructions to students with
disabilities (Zhang et al., 2005). A survey study indicated that school-based enterprises, job placement services, and mentorship programs with employers were the least commonly available career development activities in high-schools (Carter, Trainor, et al., 2010). Youth with disabilities also had low participation in summer employment, especially in integrated employment settings (Carter, Dutchman, et al., 2010).

Last, youth with disabilities may not encounter positive happenstances through social experiences. Youth with disabilities were reported to have a more solitary and passive participation in leisure activities (Buttimer & Tierney, 2005; Verdonschot et al., 2009). At school, multiple studies indicated that youth with disabilities have limited participation in extracurricular activities (Modell & Valdez, 2002; Powers et al., 2005; Simeonsson, 2001) as well as school activities outside of classroom instruction (Wagner et al., 2004). The limited exposure to work and social experiences may also limit their exposure to areas of interest or disinterest, which has been reported as another meaningful happenstance in people’s career development (Betsworth & Hansen, 1996).

**Assessment of Planned Happenstance Skills**

Measuring PHS is the first important step to determine the status of college students with disabilities with regard to developing PHS for career development. Without a valid means to measure PHS for college students with disabilities, PHS will remain an abstract, intangible concept for this population. Kim, Jung, et al. (2014) developed the Planned Happenstance Career Inventory (PHCI) to assess skills in using chance events to develop career opportunities. The PHCI was developed in South Korea, and thus the instrument was written in Korean. The content of the PHCI was based on the description of PHS presented by Mitchell et al. (1999) and consisted of five dimensions: curiosity, persistence, flexibility, optimism, and risk-taking.
The PHCI measures how much one is aware of and interested in new career opportunities. Higher scores on the PHCI indicate greater confidence in transforming unexpected events into career-related opportunities. The psychometric properties of the English version of the PHCI (PHCI-E) were investigated through a process of translation and back-translation of the PHCI items and the PHCI-E scores of U.S. college students from the general population (Lee et al., 2017). The internal consistency scores, which provide evidence of reliability, of the PHCI-E dimensions ranged from .75 to .85, which closely approximated the internal consistency from the original (i.e. Korean) version of PHCI. Additionally, Lee et al. (2017) found evidence for construct validity of the PHCI-E. The PHCI-E items yielded positive correlations with the Career Decision-Making Self-Efficacy – Short Form (CDMSE-SF; Betz et al., 1996) and the Occupational Engagement Scale for Students (OES-S; Cox et al., 2015).

No evidence has yet been published in the professional literature that points to the validity of the PHCI-E when used with college students with disabilities. A psychometrically valid instrument is required to generate knowledge about the current levels of PHS of college students with disabilities. To evaluate the psychometric properties of the PHCI-E for students with disabilities, it is critical to examine the internal consistency reliability of the PHCI-E when it is used with this population. Although establishing reliability of an instrument is a necessary condition for establishing an instrument’s validity, reliability is not sufficient to establish validity. Thus, it is critical to also evaluate the concurrent validity of the PHCI-E by comparing scores on it with measures of related constructs, as Lee et al. (2017) did with her sample of students without disabilities. The CDMSE-SF has been validated for use with college students with disabilities (Luzzo et al., 1999), and therefore it can function as a tool to evaluate the concurrent validity of the PHCI-E. The OES-S has not been used to measure the occupational
engagement of people with disabilities. Therefore, the psychometric properties of the OES-S for college students with disabilities will need to be investigated as well. Documenting the technical adequacy of instrumentation (i.e., PHCI-E, OES-S) is essential to making scientifically defensible knowledge claims about the status of college students with disabilities in relation to critically important career-related constructs (e.g., PHS, occupational engagement).

**Dissertation Purpose and Research Questions**

The purpose of this dissertation project was to expand the literature on PHS and college students with disabilities. I conducted three different studies to reach this purpose. Each study is described as follows.

**Study 1: Validity and reliability of the PHCI-E and OES-S among college students with disabilities**

The purpose of the first study was to investigate the extent to which a scale designed to measure PHS of people from the general population provides a valid means to measure PHS of people with disabilities. I examined the internal consistency reliability, content validity, and concurrent validity of the PHCI-E and OES-S with college students with disabilities. Specific research questions, along with interpretations of possible results, are provided below:

(1a) To what extent do items on the PHCI-E demonstrate internal consistency when used with college students with disabilities, as indicated by Cronbach’s alpha?

I interpreted Cronbach’s alpha values using the conventional standards (George & Mallery, 2003): 0 to 0.49 as unacceptable, 0.5 to 0.59 as poor, 0.6 to 0.69 as questionable, 0.7 to 0.79 as acceptable, 0.8 to 0.89 as good, and 0.9 to 0.95 as excellent.
(1b) To what extent does the PHCI-E display content validity, as indicated by the item-level Content Validity Index (I-CVI) and scale-level Content Validity Index (S-CVI)?

Using the published guidelines for interpreting the Content Validity Index, when there are six experts rating the PHCI-E items (Davis, 1992), I considered a generated I-CVI score (i.e., proportion of content experts rating an item as relevant or highly relevant) less than 0.78 as not acceptable and 0.78 or higher as acceptable.

Using Davis’s same guidelines, I considered a generated S-CVI score (i.e., average of the I-CVIs for all items on the scale) less than 0.90 as not acceptable and 0.90 and higher as acceptable. These standards (Lynn, 1986; Polit & Beck, 2006) are conventional cut points, but greater I-CVI and S-CVI indicate greater confidence in content validity.

(1c) To what extent does the correlation between the PHCI-E and the CDMSE-SF show indicators of concurrent validity of the PHCI-E with the CDMSE-SF when used with college students with disabilities, as indicated by Pearson’s correlation coefficient?

I interpreted Pearson’s $r$ using the conventional standards (Evans, 1996): 0 to 0.19 as very weak, 0.20 to 0.39 as weak, 0.40 to 0.59 as moderate, 0.60 to 0.79 as strong, and 0.80 to 1.00 as very strong.

(2a) To what extent do items on the OES-S demonstrate internal consistency when used with college students with disabilities, as indicated by Cronbach’s alpha?

I interpreted Cronbach’s alpha values using the conventional standards (George & Mallery, 2003): 0 to 0.49 as unacceptable, 0.5 to 0.59 as poor, 0.6 to 0.69 as questionable, 0.7 to 0.79 as acceptable, 0.8 to 0.89 as good, and 0.9 to 0.95 as excellent.
(2b) To what extent does the OES-S display content validity when used with college students with disabilities, as indicated by the I-CVI and S-CVI?

Using the published guidelines for interpreting the Content Validity Index, when there are six experts rating the OES-S items (Davis, 1992), I considered a generated I-CVI score (i.e., proportion of content experts rating an item as relevant or highly relevant) less than 0.78 as not acceptable and 0.78 and higher as acceptable.

Using Davis’s same guidelines, I considered a generated S-CVI score (i.e., average of the I-CVIs for all items on the scale) less than 0.90 as not acceptable and 0.90 and higher as acceptable. These standards (Lynn, 1986; Polit & Beck, 2006) are conventional cut points, but greater I-CVI and S-CVI indicate greater confidence in content validity.

(2c) To what extent does the correlation between the OES-S and the CDMSE-SF show indicators of concurrent validity of the OES-S with the CDMSE-SF when used with college students with disabilities, as indicated by Pearson correlation coefficient?

I interpreted Pearson’s $r$ using the conventional standards (Evans, 1996): 0 to 0.19 as very weak, 0.20 to 0.39 as weak, 0.40 to 0.59 as moderate, 0.60 to 0.79 as strong, and 0.80 to 1.00 as very strong.

**Study 2: Evaluating differences in college students’ planned happenstance skills on the basis of disability status**

The purpose of the second study was to examine variables besides disability status that predict PHS among college students and investigate differences in PHS between college students with and without disabilities. I examined the proportion of variance in the PHCI-E scores of college students with and without disabilities that can be predicted by the covariates. Moreover, I examined if there was a statistical significance in the PHCI-E scores of college students based on
disability status, after controlling for key covariates. Specific research questions, along with the interpretation of possible results, are provided below:

(1) To what extent can variance in the PHCI-E scores of college students with and without disabilities be predicted by baseline covariates (i.e., age, year of study, gender, race/ethnicity, socioeconomic status), as indicated by the coefficient of determination ($R^2$) value?

I interpreted the $R^2$ value using the conventional standards (Cohen, 1988): less than 0.12 as weak, 0.13 to 0.25 as medium, and 0.26 and higher as large.

(2) After controlling for key covariates, what is the magnitude of the differences in the PHCI-E scores of college students based on disability status, as measured by Hedges’ $g$?

I interpreted Hedges’ $g$ using the conventional standards (Hedges, 1981): less than 0.49 as small, 0.5 to 0.79 as medium, and 0.8 and higher as large magnitudes.

**Study 3: Relationship between planned happenstance skills and occupational engagement among college students with disabilities**

The purpose of the third study was to investigate the extent to which PHS predict occupational engagement among college students with disabilities. I examined the relationship between the PHCI-E and OES-S scores among college students with disabilities. Specific research questions, along with the interpretation of possible results, are provided below:

(1) Is PHS a statistically significant predictor of occupational engagement, as indicated by $p$ value?

I used a significance level of .05. A $p$ value that is less than .05 was interpreted as a statistically significant effect (i.e., PHS is a statistically significant predictor of occupational engagement).
What proportion of variance in occupational engagement is predicted by PHS, as indicated by the coefficient of determination ($R^2$) value?

I interpreted the $R^2$ value using the conventional standards (Cohen, 1988): less than 0.12 as weak, 0.13 to 0.25 as moderate, and 0.26 and higher as substantial.

**Definition of Key Terms**

*Planned Happenstance Skills (PHS)* refers to “five skills to recognize, create, and use chance as career opportunities” (Mitchell et al., 1999, p. 118). The five skills are: (a) curiosity, persistence, flexibility, optimism, and risk-taking (Mitchell et al., 1999). One instrument to quantitatively measure PHS is the PHCI-E (Lee et al., 2017).

*Occupational engagement* refers to the state in which one is “gathering information to make a [emphasis in original] decision, and … taking part in activities that increase information about the self, the world, and the relation between self and the world to make future [emphasis in original] decisions” (Cox et al., 2015, p. 108). One instrument to quantitatively measure occupational engagement is the OES-S (Cox et al., 2015).

*Career decision-making self-efficacy* refers to “an individual’s degree of belief that he or she can successfully complete tasks necessary to making career decisions” (Betz & Luzzo, 1996, p. 415). One instrument to quantitatively measure career decision-making self-efficacy is the CDMSE-SF (Betz et al., 1996).

*Internal consistency reliability* refers to “whether items on a test (or a subscale of a composite test), that are intended to measure the same construct, produce consistent scores” (Tang et al., 2014, p. 206). One quantitative approach to evaluating the internal consistency reliability of an instrument is by examining the means of the Cronbach’s alpha (Cronbach, 1951).
Content validity refers to “the degree to which an instrument has an appropriate sample of items of the construct being measured” (Polit & Beck, 2004, p. 423). It is a subjective measure that is often established through an expert panel review. Expert feedback can be collected in the form of qualitative and/or quantitative data. One quantitative approach to evaluating the content validity of an instrument is the Content Validity Index (Tojib & Sugianto, 2006).

Concurrent validity refers to the degree of similarity between the target scale and another scale for which validity is known (Payton, 1988). One method to provide evidence of concurrent validity is by correlating two scales given to the same participants at approximately the same time. One quantitative approach to evaluating the construct validity of an instrument is by examining the Pearson correlation between two instruments that measure a similar construct (Westen & Rosenthal, 2003).
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Chapter 2: Validity and Reliability of the PHCI-E and the OES-S among College Students with Disabilities

The purpose of this chapter is to provide the rationale and methods for the first part of my dissertation project. First, I provide the rationale for examining the validity and reliability of scales measuring planned happenstance skills (PHS) and occupational engagement among college students with disabilities. Second, I summarize the existing literature on PHS and occupational engagement. Third, I present the purpose of these studies and the research questions the studies aim to answer. Fourth, I explain my methodology for data collection and analysis. Finally, I present and discuss the findings.

Happenstance Learning Theory

One benefit of earning a college degree is that college graduates have better opportunities to enter careers that provide long term job satisfaction (Hillman & McMillan, 2005). However, determining a future career is a challenging task for most college students (Murphy et al., 2010). Multiple factors influence how one navigates the career decision-making process, especially events that are unplanned and unexpected. For decades, theories have been developed to explain how unplanned and unexpected events influence the career development process, including accident theory (Crites, 1969), the chance theory of vocational selection (Osipow, 1973), the chaos theory of careers (Pryor & Bright, 2003), and happenstance learning theory (HLT; Krumboltz, 2009). In support of HLT, there have been multiple studies where findings have indicated that unplanned events, or happenstances, can profoundly shape one’s career paths (Betsworth & Hansen, 1996; Bright et al., 2006; Guindon & Hanna, 2002).

Happenstances can significantly influence career paths, either positively or negatively. Rojewski (1999) argued that compared to their peers from the general population, youth with
disabilities have fewer opportunities for positive happenstances and are more prone to experience negative happenstances. Youth with disabilities’ lack of access to positive happenstances and greater exposure to negative happenstances may be linked to limited opportunities and low expectations. For instance, many youth with disabilities have limited access to school-to-work education and employability skills instruction (Zhang et al., 2005) and regularly encounter low expectations from teachers and family members regarding employment options (Blacher et al., 2010; Grigal & Neubert, 2004; Powers et al., 2009). Moreover, prior research shows that compared to peers without disabilities, students with disabilities have limited opportunities to participate in extracurricular activities (Modell & Valdez, 2002; Powers et al., 2005; Simeonsson, 2001), the general education curriculum (Kurth et al., 2014), and career development activities (Carter et al., 2010).

Although the ways in which happenstances of youth with disabilities influence their career development have not been extensively researched, findings from several studies have indicated that youth with disabilities experience greater challenges and poorer outcomes in their career development (e.g., Luzzo et al., 1999; Ochs & Roessler, 2001). High school students with disabilities were reported to have significantly lower scores on career decision-making self-efficacy, career outcome expectations, career exploration intentions, and vocational identity compared to peers without disabilities (Ochs & Roessler, 2001). At the college level, studies have indicated that undergraduates with disabilities express lower career decision-making self-efficacy (Luzzo et al., 1999), higher career-related commitment anxiety and decision-making confusion (Strauser et al., 2004), and higher external conflict related to career thoughts (Dipeolu et al., 2002).
Planned Happenstance Skills

Krumboltz’s (1996, 2009) happenstance learning theory (HLT) was proposed to explain how unplanned and unexpected events influence career development. HLT has been widely acknowledged in the discipline of career counseling for over two decades (e.g., see Mitchell et al., 1999; Sharf, 2013). A major implication of HLT is the importance of encouraging youth to anticipate and utilize happenstances in their career development process. Based on HLT, Mitchell et al. (1999) proposed a set of skills (i.e., Planned Happenstance Skills or PHS) to generate and take advantage of happenstances for developing new knowledge, interests, and skills. PHS consists of five related skills: (a) curiosity - exploring new learning opportunities; (b) persistence - exerting ongoing effort despite setbacks; (c) optimism - viewing new opportunities as possible and attainable; (d) flexibility - adapting to changing attitudes and circumstances; and (e) risk-taking - taking actions in the face of uncertainty.

The first attempt to assess PHS as a measurable construct was done by Kim, Jung, et al. (2014), who developed the Planned Happenstance Career Inventory (PHCI) in South Korea. The PHCI measures awareness and interests in new career opportunities. It consists of five sub-scales measuring each dimension of PHS (i.e., curiosity, persistence, optimism, flexibility, risk-taking). Each dimension consists of five items, and higher scores indicate greater confidence in generating and using happenstances. Internal consistency reliability of the five dimensions were relatively high, as indicated by Cronbach’s alpha values that ranged from .78 to .86. Evidence of construct validity was established by data revealing significant correlations between the total PHCI scores and scores of three scales: (a) Career Preparation Behavior Scale (CPBS; Kim & Kim, 1997), (b) the Career Decision-Making Self-Efficacy – Short Form (CDMSE-SF; Betz et al., 1996), and Career Stress Inventory for College Students (CSI; Choi et al., 2011). PHS was
positively correlated with career preparation behavior \((r = .23, p < .01)\), positively correlated with career decision-making self-efficacy \((r = .56, p < .001)\), and negatively correlated with career stress \((r = .28, p < .001; \text{Kim, Jung, et al., 2014})\).

Multiple studies examining the relationship between PHS and other career-related constructs have been conducted using the PHCI in South Korea. PHS was associated with higher career decision-making self-efficacy and occupational engagement \((\text{Kim, Jang, et al., 2014; Kim, Jung, et al., 2014})\), and lower career stress \((\text{Kim, Jang, et al., 2014})\). College students \((\text{Rhee et al., 2016})\) and high school students \((\text{Ahn et al., 2015})\) with higher PHS also had more advanced vocational identity status. People with more advanced occupational identity status are more committed to occupational roles they have thoroughly explored \((\text{Porfeli et al., 2011})\), which is associated with higher job and life satisfaction \((\text{Hirschi, 2011})\). In summary, higher levels of PHS have been linked with an array of career-related constructs.

**Planned Happenstance Career Inventory-English**

Lee et al. \((2017)\) developed the English version of the PHCI \((i.e., \text{PHCI-E})\), utilizing a translation and back-translation process. The PHCI-E also measured the five dimensions of PHS: (a) Curiosity \((e.g., \text{“I am curious to know what happens around me by chance”})\), (b) Flexibility \((e.g., \text{“I think my career path can change at any time in my life”})\), (c) Persistence \((e.g., \text{“I will keep putting my efforts despite unexpected difficulties”})\), (d) Optimism \((e.g., \text{“I have a positive view of my future career path”})\), and (e) Risk-taking \((e.g., \text{“I am willing to take risks and try even if the outcome is uncertain”})\). There were five items related to each dimension, and each item was scored on a 5-point Likert scale, ranging from 1 \((\text{never true})\) to 5 \((\text{always true})\).

The cross-cultural validity of the PHCI-E was examined with a sample of U.S. college students \((\text{Lee et al., 2017})\). Evidence of internal consistency reliability was provided by
Cronbach’s alpha, with values ranging from .75 to .85 for the five dimensions (Lee et al., 2017). To demonstrate the construct validity of the PHCI-E, Lee et al. (2017) conducted a correlation analysis between the PHCI-E scores in each dimension with the scores of two scales: CDMSE-SF (Betz et al., 1996) and the Vocational Identity Status Assessment (VISA; Porfeli et al., 2011). The VISA is comprised of six subscales: (a) commitment making, (b) identification with commitment, (c) in-depth exploration, (d) in-breadth exploration, (e) career self-doubt, and (f) commitment flexibility. Table 2.1 shows the relationships among the PHCI-E in each dimension, the CDMSE-SF, and the VISA subscales. Four dimensions of the PHCI-E (i.e., curiosity, persistence, optimism, and risk-taking) yielded significant positive correlations with the CDMSE-SF scores (Betz et al., 1996), ranging from .41 to .61 (Lee et al., 2017). Construct validity for the flexibility dimension of the PHCI-E was demonstrated through its significant correlations with four out of six subscales of the VISA (i.e., commitment making, in-breadth exploration, career self-doubt, and commitment flexibility). The study using the PHCI-E was conducted with the general population (Lee et al., 2017). Therefore, there is a gap in the knowledge base with regard to evidence for the reliability and validity of the PHCI-E when it is used with people with disabilities.

**Occupational Engagement**

Occupational engagement is a career-related construct that is known to have a significant positive correlation with PHS (Kim, Jang, et al., 2014). The construct of occupational engagement emerged from the trilateral model of adaptive decision making (Krieshok et al., 2009), which suggested that career decision making involves integrating nonconscious process and dynamic careers via occupational engagement, as well as intuitive and rational decision-making. A person with high occupational engagement actively gathers information and takes
action to increase information to make career-related decisions (Cox et al., 2015). There have been multiple research projects utilizing the construct of occupational engagement (Black, 2006; Cox, 2008; Cox et al., 2007, 2015; Scott, 2006). Using the 14-item version of OES-S (Cox, 2008), Ghosh and Fouad (2016) found that occupational engagement predicted the readiness of student veterans to participate in career planning activities. The most recent version of the OES-S (Cox et al., 2015) consisted of nine items and have been used across multiple studies to examine how occupational engagement correlated with other career-related constructs (e.g., Blount et al., 2018; Jenkins & Jeske, 2017). However, none of these studies have included people with disabilities.

Higher levels of occupational engagement have been associated with more positive status in relation to a variety of career-related constructs. Occupational engagement was reported to predict academic major satisfaction among college students (Cox et al., 2016). A study with sport management college students revealed that students with more of an internal career locus of control were more likely to have higher occupational engagement (Duve, 2015). Occupational engagement was also studied in countries with more collectivistic cultures (i.e., China and Paraguay), with findings showing a significant correlation with positive psychological measures (i.e., life satisfaction, vocational identity, hope, and personal growth; Vuyk et al., 2019).

Different factors influenced the level of occupational engagement. College students who perceived that they received more support (e.g., social, emotional, informational support) gained higher occupational engagement in the U.S. (Jenkins & Jeske, 2017) and South Korea (Kim et al., 2018). In a pre- and post-assessment study, an increased level of occupational engagement was found among college students over the span of a career counseling course (Blount et al., 2018).
Occupational Engagement Scale-Student

The OES-S is a 9-item single-factor instrument. Sample items include “I talk about my career choices with family and friends” and “I volunteer in an area that I find interesting.” Each item is rated on a 5-point Likert scale, ranging from 1 (not at all like me) to 5 (very much like me). A total score (composite) is calculated by averaging the items, resulting in a range of possible scores from 1 (least possible occupational engagement) to 5 (most possible occupational engagement).

The internal consistency of the OES-S was evidenced by Cronbach’s alpha of .80 with college student samples (Cox et al., 2015). Evidence of criterion validity of the OES-S was supported through the relation between the OES-S scores and three career-related constructs: (a) vocational identity measured via the VISA (Holland, 1997), (b) academic major satisfaction measured via the Academic Major Satisfaction Scale (Nauta, 2007), and (c) gains in personal development, vocational competence, and general education measured via the Estimate of Gains Scale (Gonyea et al., 2003). After controlling for other key variables, the OES-S accounted for a significant portion of the vocational identity variance ($R^2 = .11$), major satisfaction variance ($R^2 = .06$), and gains in personal development ($R^2 = .17$), vocational competence ($R^2 = .19$), and general education variances ($R^2 = .09$; Cox et al., 2015). To date, no studies using the OES-S have included people with disabilities. Therefore, the reliability and validity of the scale when used with people with disabilities has not been established.

Purpose of the Studies

Although findings from multiple studies have indicated that PHS and occupational engagement are important career-related constructs associated with positive career development outcomes, college students with disabilities were not reported to participate in any of these
studies. The reliability and validity of the PHCI-E (Lee et al., 2017) and OES-S (Cox et al., 2015) when used with college students with disabilities have not yet been investigated and therefore are unknown. Thus, the purpose of this research was to examine the validity and reliability of the PHCI-E and the OES-S among college students with disabilities. To achieve this aim, two studies were conducted. Study 1 was designed to answer the following research questions:

(1a) To what extent do items on the PHCI-E demonstrate internal consistency when used with college students with disabilities, as indicated by Cronbach’s alpha?

(1b) To what extent does the PHCI-E display content validity, as indicated by the item-level Content Validity Index (I-CVI) and scale-level Content Validity Index (S-CVI)?

(1c) To what extent does the correlation between the PHCI-E and the CDMSE-SF show indicators of concurrent validity of the PHCI-E with the CDMSE-SF when used with college students with disabilities, as indicated by Pearson’s correlation coefficient?

Study 2 was designed to answer the following research questions:

(2a) To what extent do items on the OES-S demonstrate internal consistency when used with college students with disabilities, as indicated by Cronbach’s alpha?

(2b) To what extent does the OES-S display content validity when used with college students with disabilities, as indicated by the I-CVI and S-CVI?

(2c) To what extent does the correlation between the OES-S and the CDMSE-SF show indicators of concurrent validity of the OES-S with the CDMSE-SF when used with college students with disabilities, as indicated by Pearson correlation coefficient?
Method

Participants

For Studies 1 and 2, participants were recruited at two four-year public universities in the state of Kansas. The office of Student Access Services sent recruitment emails to undergraduate students registered at their offices to receive accommodations. Participants met the inclusion criteria for Study 1 and 2 if they were: (a) enrolled full-time, (b) attending an undergraduate degree-seeking program, and (c) registered at the Student Access Service to receive accommodations due to permanent disability status. A total of 232 undergraduate students participated. However, 68 participants did not meet the inclusion criteria and 16 participants did not complete the PHCI-E and the OES-S items. In total, responses from 148 participants were used for data analysis. The participants had a mean age of 21.78 years (SD = 4.70). Table 2.2 presents the sociodemographic characteristics of the participants, and Table 2.3 presents disability-related conditions identified by the participants that elicited their needs for accommodations while attending their university.

Instruments

The CDMSE-SF (Betz et al., 1996) and its license to reproduce copies were purchased and used to assess the concurrent validity of the PHCI-E and the OES-S among college students with disabilities. The rationale for using the CDMSE-SF is that the scale is currently in circulation and has been widely accepted to measure career-decision making involving youth and young adults with disabilities in the U.S. (Bell, 2012; Luzzo et al., 1999; Norvilitis et al., 2010). Furthermore, multiple studies have indicated that career decision-making is significantly correlated with occupational engagement (Kim, Jang, et al., 2014; Kim & Lee, 2018) and PHS (Kim, Jung, et al., 2014; Kim et al., 2015; Lee et al., 2017). The CDMSE-SF is a 25-item scale
that measures one’s confidence in their ability to successfully complete tasks necessary to make career-related decisions. Each item is rated on a 5-point Likert scale, ranging from 1 (no confidence at all) to 5 (complete confidence). For example, one of the items is: “How much confidence do you have that you could select one major from a list of potential majors you are considering?” Confidence scores are summed across all 25 items, and higher sums indicate greater levels of career decision-making self-efficacy.

The internal consistency reliability of the CDMSE-SF has yielded Cronbach’s alpha as high as .94 with college student samples (Betz & Luzzo, 1996). The CDMSE-SF has also been used with a sample of college students with disabilities to evaluate differences in the level of career decision-making self-efficacy based on disability status (Luzzo et al., 1999). Evidence of validity of the CDMSE-SF has been demonstrated through a significant relationship between CDMSE-SF scores and career indecision (Betz et al., 1996; Wolfe & Betz, 2004).

Procedures

Content Validity

Study 1. Evidence of content validity of the PHCI-E can be demonstrated by the I-CVI and S-CVI. Contents experts were asked to rate the items according to their relevance to the construct of interest (i.e., planned happenstance skills) on a scale of 1 to 4. I-CVI represents the proportion of content experts giving items a relevance rating of 3 (relevant) or 4 (highly relevant). I-CVI was computed by counting the number of experts giving a rating 3 or 4 for an item, divided by six (i.e., the total number of experts). Table 2.4 presents the final version of

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edited items of the PHCI-E and the I-CVI for each item. A minimum of 0.78 is required for an item to demonstrate an acceptable content validity (Lynn, 1986; Polit & Beck, 2006).

Six experts on youth with disabilities and transition issues were recruited to review the PHCI-E and provide content validity data for the items in the instrument. Qualification for the recruited experts included a doctoral degree in special education, work experience in the transition field, and publications of research articles in the transition area for people with disabilities. As the first step, each expert independently evaluated 25 items of the PHCI-E by rating each item on a 4-point Likert scale, ranging from 1 (not relevant) to 4 (highly relevant). Each expert could suggest edits to items rated 1 (not relevant) or 2 (somewhat relevant).

Next, I calculated the I-CVI by computing the number of experts giving a rating of 3 (relevant) or 4 (highly relevant), divided by the total number of experts. Items with I-CVI less than .78 were further evaluated for editing. I reviewed all suggested edits and edited the items accordingly. Then each expert independently re-evaluated the edited items. These steps were repeated until the I-CVI of all items in the PHCI-E were .78 or higher. Table 2.4 presents the final version of the PHCI-E, which was used to collect data to evaluate the internal consistency reliability and concurrent validity of both instruments.

S-CVI represents the content validity of the overall scale. S-CVI was computed by counting the number of items rated as 3 (relevant) and 4 (highly relevant), divided by the total number of ratings (i.e., number of the PHCI-E items multiplied by the number of experts). When there are six experts or more rating the items, a minimum of S-CVI of 0.90 is required for a scale to demonstrate an acceptable content validity (Lynn, 1986; Polit & Beck, 2006).
Study 2. The procedures to measure content validity of the OES-S were identical to those used to measure the content validity of PHCI-E in Study 1. There were, however, only nine items in the OES-S.

Internal Consistency Reliability and Concurrent Validity

A university institutional review board approved the procedures prior to participant recruitment. Recruitment e-mails were sent to the Student Access Services office at two universities in the state of Kansas. The e-mails informed potential participants about the purpose of the study, criteria for eligible participants, the approximate length of survey completion, and the link to the survey. Undergraduate students who consented to participate completed a demographic survey (e.g., age, gender, year of study, accommodations received on campus), 25 items of the PHCI-E, 9 items of the OES-S, and 25 items of the CDMSE-SF. All items on the survey were forced choice and did not allow participants to skip any items.

Study 1. To evaluate the internal consistency reliability of the PHCI-E, I used Cronbach’s alpha to measure the strength of the relationships of the five items within each dimension (i.e., curiosity, flexibility, persistence, optimism, risk-taking). Because of sample size constraints, all analyses were done with the classical test theory framework (i.e., evidence for internal consistency reliability was investigated using Cronbach’s alpha; Cronbach, 1951, 1969; Cronbach & Meehl, 1955). To verify the concurrent validity of the PHCI-E, I measured the extent of the linear relationship between the scores of each dimension of PHCI-E and the CDMSE-SF scores. Evidence for concurrent validity of the PHCI-E was indicated by Pearson’s correlation coefficient (r).

Study 2. To evaluate the internal consistency reliability of the PHCI-E, I calculated the sum of scores across the nine items of the OES-S. Again, evidence for internal consistency
reliability was investigated using Cronbach’s alpha (Cronbach, 1951, 1969; Cronbach & Meehl, 1955). To verify the concurrent validity of the OES-S, I measured the extent of the linear relationship between the OES-S and the CDMSE-SF scores. The evidence for concurrent validity of the OES-S was indicated by Pearson’s correlation coefficient ($r$).

**Results**

**Study 1**

**Content Validity**

I-CVI for the PHCI-E items ranged from 0.83 to 1.00. In the curiosity dimension, three out of five items yielded I-CVI of 0.83, and two items yielded 1.00. In the flexibility, optimism, and risk-taking dimensions, one item yielded I-CVI of 0.83 whereas the remainder of items yielded 1.00. With regard to the persistence dimension, all five items yielded I-CVI of 1.00. Overall, the edited version of the PHCI-E yielded 0.97 for S-CVI. Collectively, these results indicated that PHCI-E items (overall as well as for each dimension) demonstrated acceptable content validity.

**Internal Consistency Reliability**

To evaluate internal consistency reliability, I calculated Cronbach’s alpha (Cronbach, 1951, 1969; Cronbach & Meehl, 1955) across five items in each dimension of the PHCI-E. The Cronbach’s alpha coefficients for the PHCI-E scores were as follows: .67 for curiosity, .76 for flexibility, .76 for persistence, .85 for optimism, and .75 for risk-taking. Using conventional standards for evaluating the strength of evidence for internal consistency reliability (e.g., see George & Mallery, 2003), the coefficients of the PHCI-E scores in of three dimensions (i.e., flexibility, persistence, risk-taking) were in the .75 to .76 range, which indicated acceptable reliability. The internal consistency reliability of the PHCI-E was questionable for the curiosity
dimension (.67) and good for the optimism (.85) dimension. According to the evaluation
standards set by the What Works Clearinghouse (2008), the internal consistency reliability of the
PHCI-E scores across all of the dimensions were acceptable and above the minimum
requirement (.50).

**Concurrent Validity**

To verify the concurrent validity, I examined the extent of the linear relationship between
the PHCI-E in each dimension and the CDMSE-SF scores, as indicated by Pearson’s correlation
coefficient \( r \). Using the conventional standards (e.g., see Evans, 1996), there were weak,
positive correlations between the CDMSE-SF scores and the PHCI-E scores in two dimensions:
Curiosity \( (r = .334, p < .01) \) and flexibility \( (r = .202, p < .05) \), which were statistically
significant. There were moderate, positive correlations between the CDMSE-SF scores and the
PHCI-E scores in three dimensions: Persistence \( (r = .576, p < .01) \), optimism \( (r = .658, p < .01) \),
and risk-taking \( (r = .577, p < .01) \), which were statistically significant.

**Study 2**

**Content Validity**

Evidence of content validity of the OES-S is demonstrated by the I-CVI and S-CVI.
Table 2.5 presents the final version of edited items of the OES-S and the I-CVI for each item. I-
CVI for the OES-S items ranged from 0.83 to 1.00, which met the standard for an item (0.78) to
demonstrate an acceptable content validity when rated by six experts or more (Lynn, 1986; Polit
& Beck, 2006). The final version of the OES-S yielded .96 for S-CVI, which met the standard
(0.90) for a scale to demonstrate an acceptable content validity when rated by six experts or
more.
**Internal Consistency Reliability**

To evaluate internal consistency reliability, I calculated Cronbach’s alpha (Cronbach, 1951, 1969; Cronbach & Meehl, 1955) across nine items of the OES-S the PHCI-E. The Cronbach’s alpha for the OES-S items yielded .82. Using the conventional standards (e.g., see George & Mallery, 2003), this value indicates good internal consistency.

**Concurrent Validity**

To verify the concurrent validity, I ran a Pearson product-moment correlation to determine the extent of the linear relationship between the OES-S and the CDMSE-SF scores. There was a positive correlation between the OES-S and the CDMSE-SF scores, which was statistically significant ($r = .569, p < .01$). Using the conventional standards (e.g., see Evan, 1996), this positive correlation is moderate.

**Discussion**

The PHCI was originally developed in South Korea (Kim, 2012; Kim et al., 2014) and based on happenstance learning theory (Krumboltz, 2009; Mitchell et al., 1999). It was developed to measure a person’s ability to recognize, create, and utilize unplanned events into career development opportunities. Subsequently, Lee et al. (2017) translated the PHCI into English (i.e., the PHCI-E) and provided evidence of cross-cultural validity using a sample of college students in the U.S. Although this study generated a psychometric scale of operationally defined planned happenstance skills for practical use, it did not provide data regarding participants with disabilities. Moreover, evidence for the validity of this scale when used with college students with disabilities was lacking. To address these gaps in the professional literature and knowledge base, the current study was designed to examine the internal consistency
reliability, content validity, and concurrent validity of the PHCI-E when used with college students with disabilities.

The internal consistency reliability of the five dimensions of the PHCI-E ranged from .67 to .85. The internal consistency reliability of the PHCI-E optimism (α = .85) and risk-taking (α = .75) were the only dimensions where the results mirrored those from the cross-cultural validation study conducted by Lee et al. (2017) involving college students without disabilities. The flexibility and persistence dimensions of the PHCI-E in this study yielded acceptable intercorrelations (.77 and .76 respectively) but were slightly lower than the results from Lee et al.’s general population sample. Interestingly, results from this study as well as Lee et al.’s sample showed that the curiosity dimension had the lowest Cronbach’s alpha of all dimensions. However, this study yielded a weak intercorrelation and the Lee et al.’s study yielded an acceptable intercorrelation.

The difference between the undergraduate students with disabilities in this study and without disabilities in Lee et al.’s (2017) study of college students from the general population may be a function of restricted possibilities for students with disabilities. First, the sample size of this study was much smaller, with 148 participants, whereas Lee et al.’s study included 262 participants. Second, the sample in this study represented undergraduate students at two universities in the state of Kansas, whereas the Lee et al.’s (2017) sample included undergraduate students at a university in the southeastern region of the U.S. The composition of participants’ race and ethnicity cannot be compared because Lee et al. did not collect such data.

The OES-S yielded a strong intercorrelation (α = .83), using the conventional standards (George & Mallery, 2003). This internal consistency reliability was consistent with the results from a prior study with college students without disabilities (Cox et al., 2015). Cox et al.
evaluated the internal consistency of the OES-S using coefficient $\alpha$ and ordinal $\alpha$ (Gadermann et al., 2012). Their study yielded strong $\alpha$ values, a coefficient $\alpha$ of .80 and an ordinal $\alpha$ of .84.

Regarding concurrent validity, the present study yielded positive and statistically significant correlations between career decision-making self-efficacy and all PHS dimensions. The evidence of validity is stronger than Lee et al.’s (2017) prior study, where flexibility did not yield a statistically significant correlation. Additionally, these findings strengthened the claim that undergraduate students with disabilities who scored higher on the PHCI-E scores were likely to report higher confidence in making career decisions. However, it is important to note that, using the conventional standards (e.g., Evans, 1996), the magnitude of the correlations was not especially strong. They ranged from weak in two dimensions (i.e., curiosity and flexibility) to moderate in three dimensions (i.e., persistence, optimism, and risk-taking).

With regard to content validity, the PHCI-E and the OES-S appeared to be acceptable instruments for assessing PHS and occupational engagement respectively. Evidence for two types of content validity emerged from this study, the I-CVI and S-CVI. The I-CVI provides a measure of the content validity of the individual items in the instruments, and the S-CVI measures the content validity of the overall instruments (i.e., composite measures, or measures as a scale). The I-CVI for the PHCI-E and the OES-S demonstrated that every item in both instruments rated relevant or highly relevant by at least five out of six experts. The range of I-CVI for items in the PHCI-E and the OES-S was from 0.83 to 1.00. S-CVI demonstrated that the proportion of items in each instrument that were rated relevant or highly relevant by six experts was high, at 0.97 and 0.96 for the PHCI-E and the OES-S respectively. These findings support the adequacy of the tool to measure PHS and occupational engagement among college students with disabilities.
Limitations

Although findings from this investigation demonstrated adequate reliability and validity of the PHCI-E and the OES-S among college students with disabilities, several limitations need to be considered. First, the participants represented only two four-year public universities in a Midwest region and may not be fully representative of college students with disabilities in different types of institutions or in other geographical locations. Future investigations should include more diverse samples of college students with disabilities from multiple types of institutions and geographic regions.

Second, the self-report nature of the instruments could have distorted the participants’ responses. The findings may have been affected by a social desirability bias, which influenced participants to respond in a manner that appears favorable by the researcher or society. Furthermore, the participants may have interpreted the various points (e.g., always true to very true, not at all like me to very much like me) on the Likert scale differently. Therefore, an even metric between the various points on the scales cannot be assumed. Future studies should use triangulation to include self- and other reporters to improve researchers’ confidence in findings regarding reliability and validity. In addition, qualitative data (e.g., interviewing participants) should be included to address the limitation of Likert-scale responses.
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https://doi.org/10.1177/0894845315602120

https://doi.org/10.2307/1511261


Table 2.1

Relationship among PHS, CDMSE, and Vocational Identity Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>PHCI-E Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cu</td>
</tr>
<tr>
<td>Career decision-making self-efficacy</td>
<td>.41**</td>
</tr>
<tr>
<td>Vocational identity status</td>
<td></td>
</tr>
<tr>
<td>Commitment making</td>
<td>.34**</td>
</tr>
<tr>
<td>Identification with commitment</td>
<td>.48**</td>
</tr>
<tr>
<td>In-depth exploration</td>
<td>.52**</td>
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<tr>
<td>In-breadth exploration</td>
<td>.50**</td>
</tr>
<tr>
<td>Career self-doubt</td>
<td>-.15*</td>
</tr>
<tr>
<td>Commitment flexibility</td>
<td>-.05</td>
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</tbody>
</table>


*p < .05. **p < .01.
### Table 2.2

Demographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Baseline characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>98</td>
<td>66.2</td>
</tr>
<tr>
<td>Male</td>
<td>45</td>
<td>30.4</td>
</tr>
<tr>
<td>Non-binary</td>
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<td>3.4</td>
</tr>
<tr>
<td><strong>Year of Study</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>28</td>
<td>18.9</td>
</tr>
<tr>
<td>Year 2</td>
<td>31</td>
<td>20.9</td>
</tr>
<tr>
<td>Year 3</td>
<td>44</td>
<td>29.7</td>
</tr>
<tr>
<td>Year 4</td>
<td>31</td>
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</tr>
<tr>
<td>Year 5 or higher</td>
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</tr>
<tr>
<td><strong>Race</strong></td>
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<td>Asian</td>
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<td>Black</td>
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<tr>
<td>Native American</td>
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<td>2.0</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>1</td>
<td>0.7</td>
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<tr>
<td>White</td>
<td>115</td>
<td>77.7</td>
</tr>
<tr>
<td>Biracial/Multiracial</td>
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<td>7.4</td>
</tr>
<tr>
<td>Other/Unknown</td>
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<tr>
<td><strong>Household Annual Income</strong></td>
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<tr>
<td>Less than $20,000</td>
<td>11</td>
<td>7.4</td>
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<td>Between $20,000 - $79,999</td>
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<td>Between $80,000 - $139,999</td>
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</tr>
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<td>Between $140,000 - $199,999</td>
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<td>10.1</td>
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<tr>
<td>More than $200,000</td>
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<td>6.8</td>
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<tr>
<td>Unknown</td>
<td>31</td>
<td>20.9</td>
</tr>
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</table>
Table 2.3

Disability Conditions of Participants

<table>
<thead>
<tr>
<th>Disability conditions</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD</td>
<td>52</td>
</tr>
<tr>
<td>Mental health</td>
<td>52</td>
</tr>
<tr>
<td>Learning disability</td>
<td>35</td>
</tr>
<tr>
<td>Medical needs</td>
<td>24</td>
</tr>
<tr>
<td>Others (e.g., seizures, obsessive compulsive disorder)</td>
<td>20</td>
</tr>
<tr>
<td>Mobility</td>
<td>16</td>
</tr>
<tr>
<td>Intellectual/cognitive</td>
<td>10</td>
</tr>
<tr>
<td>Acquired brain injury</td>
<td>7</td>
</tr>
<tr>
<td>Hearing</td>
<td>7</td>
</tr>
<tr>
<td>Vision</td>
<td>5</td>
</tr>
<tr>
<td>Autism</td>
<td>3</td>
</tr>
<tr>
<td>Speech/language</td>
<td>2</td>
</tr>
</tbody>
</table>

Note. This total n in this table is more than the number of participants (n = 148) because participants were allowed to report more than one disability conditions.
### Table 2.4

**Content Validity of Final Version of the PHCI-E**

<table>
<thead>
<tr>
<th>Items</th>
<th>Number of experts rated the item as 3 or 4</th>
<th>I-CVI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am curious to know what happens around me by chance.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>2. I am willing to consider changing my career path based on what happens to me by chance.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>3. I will keep on putting my efforts despite unexpected difficulties.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>4. I have a positive view of my future career path.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>5. I will still pursue the career path I have chosen even when the consequences are uncertain.</td>
<td>5</td>
<td>0.83</td>
</tr>
<tr>
<td>6. An unusual opportunity to experience something new sparks my curiosity.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>7. I think my career path can change at any time in my life.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>8. In the course of pursuing my career path, I patiently try even if I face unexpected difficulties.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>9. My future career path is bright.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>10. I am willing to take risks and try even if the outcome is uncertain.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>11. I tend to approach unplanned events with curiosity.</td>
<td>5</td>
<td>0.83</td>
</tr>
<tr>
<td>12. I am flexible with alternative career paths, rather than pursuing only one.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>13. I tend to keep trying despite difficulties in career exploration*</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>14. I think my future is full of possibilities.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>15. In course of pursuing my career path, I am ready to take risks to a certain extent.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>16. I am very interested in new activities which might be helpful for my career path choice.</td>
<td>5</td>
<td>0.83</td>
</tr>
<tr>
<td>17. I tend to be flexible in making career decisions.</td>
<td>5</td>
<td>0.83</td>
</tr>
<tr>
<td>18. I will patiently follow my path despite any unexpected difficulties in my career exploration process.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>19. Along my career path, there will be many opportunities to come.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>20. I am willing to challenge myself to unknown things for a more satisfactory career path.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>21. When I come across career information, I explore it with curiosity.*</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>22. I think that career paths can change anytime.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>23. I persistently make efforts to fulfill my career plan despite unexpected difficulties.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>24. Even if my career path does not follow my initial plan, it will be good.</td>
<td>5</td>
<td>0.83</td>
</tr>
<tr>
<td>25. Even if success is not guaranteed in a specific job, I will give it a try.</td>
<td>5</td>
<td>0.83</td>
</tr>
</tbody>
</table>

*Note.* *Items that were edited with the suggestions from the experts.*
Table 2.5
Content Validity of Final Version of the OES-S

<table>
<thead>
<tr>
<th>Items</th>
<th>Number of experts rated the item as 3 or 4</th>
<th>I-CVI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I talk about my career choices with family of friends.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>2. I have contact with people working in fields I find interesting.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>3. I gain hands on experience that I might use in the future.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>4. I volunteer in an area that I find interesting.</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>5. I attend presentations or talks related to a career I might find interesting.</td>
<td>5</td>
<td>0.83</td>
</tr>
<tr>
<td>6. I talk to people about what they do for a living or what they are interested in doing.*</td>
<td>5</td>
<td>0.83</td>
</tr>
<tr>
<td>7. I visit places I’m interested in because I just know I will learn something new.*</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>8. I pursue different opportunities in life because I just know I will learn something new.*</td>
<td>6</td>
<td>1.00</td>
</tr>
<tr>
<td>9. I pursue participate in activities that I find interesting.*</td>
<td>6</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note. *Items that were edited with the suggestions from the experts.*
Chapter 3: Evaluating Differences in College Students’ Planned Happenstance Skills on the Basis of Disability Status

In this chapter, I provide the rationale for evaluating the level of planned happenstance skills (PHS) of college students with disabilities when compared to their non-disabled peers. Second, I explain the rationale for examining demographic factors that may explain discrepancies in levels of PHS among college students. Third, I present the purpose of this study and the research questions the study aims to answer. Fourth, I describe the method and data analysis for this research. Finally, I present and discuss the findings.

Unplanned and unexpected circumstances, or happenstances, have an important role in shaping people’s career paths (Betsworth & Hansen, 1996; Bright et al., 2006, 2009). Happenstances in one’s life (e.g., barriers to original plans, introductions to new areas of interests, changing demands in the job market) are inevitable. They can, however, be beneficial to a person in creating new career opportunities. Mitchell et al. (1999) proposed fostering the PHS of youth and young adults to empower them to recognize, create, and use happenstances as positive career opportunities. PHS are particularly important for college students who are in the process of making career decisions (Yang et al., 2017).

PHS have been primarily studied with college and secondary students in South Korea (Ahn et al., 2015; Kim et al., 2014, 2018; Rhee et al., 2016; Yang et al., 2017). These studies’ findings indicated that PHS is positively associated with other career-related constructs (e.g., career decision-making self-efficacy [CDMSE], occupational engagement) that are important in career development. However, little is known about how happenstances influence the career development of college students with disabilities. Rojewski (1999) argued that the happenstances of people with disabilities are more likely to be negative and challenging to their career
development. Furthermore, even less is known about the development of PHS of college students with disabilities.

**PHS and Disabilities**

PHS refer to skills necessary to recognize, create, and utilize unplanned events as career opportunities (Mitchell et al., 1999). PHS include five related skills: (a) curiosity - exploring new learning opportunities; (b) persistence - exerting ongoing effort despite setbacks; (c) optimism - viewing new opportunities as possible and attainable; (d) flexibility - adapting to changing attitudes and circumstances; and (e) risk-taking - taking actions in the face of uncertainty. PHS are quantitatively measured via the Planned Happenstance Career Inventory – English version (PHCI-E; Lee et al., 2017). There are several factors, separately or in combination, that have been put forth to explain why college students with disabilities may struggle in developing PHS compared to their counterparts without disabilities.

First, college students with disabilities have been reported to have lower CDMSE when compared to their peers without disabilities (Luzzo et al., 1999). CDMSE refers to one’s degree of belief that one has the capability to take actions necessary to making career decisions (Betz & Luzzo, 1996). Multiple studies indicated that PHS are strongly correlated with CDMSE (Kim et al., 2014, 2015). Specifically, findings show that college students with higher PHS were more likely to have higher CDMSE. Unfortunately, college students with disabilities may have lower PHS compared to their counterparts without disabilities given the positive correlation between PHS and CDMSE (Kim et al., 2014, 2015).

A second reason to suggest that college students with disabilities may possess lower PHS than their peers without disabilities is based on research findings regarding career barriers. Career barriers refer to impeding conditions that may disturb one’s career development, such as a
lack of career experience or knowledge (Crites, 1969). Perceived career barriers may hinder people to participate in career development activities (Krumboltz, 2009), hence limit opportunities to develop PHS (Mitchell et al., 1999). In a study with college students without disabilities, three dimensions of PHS (i.e., persistence, optimism, and risk-taking) were reported to be negatively associated with perceived career barriers (Yang et al., 2017). Studies suggest that people with disabilities are more likely to encounter career barriers that impede their career development (Fabian et al., 2009; Punch et al., 2006). Among the most prominent career barriers that people with disabilities perceived were a lack of understanding of their disability by others, reduced awareness of helpful strategies in career development activities (Punch et al., 2006), and limited social network, work skills, and job choices due to their disability (Fabian et al., 2009). These perceived career barriers may impede the development of the PHS of people with disabilities.

Third, disability status has been associated with higher levels of dysfunctional career thoughts (Dipeolu et al., 2002, 2013). Dysfunctional career thoughts refer to a thinking process that “inhibits effective career problem solving and decision making” (Sampson et al., 1996, p. 2). A longitudinal study revealed that PHS had a moderating effect on the relationship between dysfunctional career thoughts and CDMSE in the general population from the start of college to after college (Kim et al., 2015). College students with a higher level of dysfunctional career thoughts reported less decrease in CDMSE after college when their level of PHS was high. In other words, a high level of PHS buffered the longitudinal effects of dysfunctional career thoughts on decreasing CDMSE. Given this moderating effect of PHS, a low level of PHS may explain the high level of dysfunctional career thoughts (Dipeolu et al., 2002, 2013) and low CDMSE (Luzzo et al., 1999) among college students with disabilities.
PHS and Demographic Attributes

There are other factors that may explain the differences in PHS levels among college students other than disability status. Some demographic attributes that may contribute to the different degrees of PHS among college students are age, year of study, gender, race/ethnicity, and socioeconomic status (SES). These are discussed in the following sections.

Age and year of study

Studies on PHS with the general population have indicated that PHS level changes over time (Kim et al., 2017, 2018; Yang et al., 2017). Research findings have indicated that all dimensions in PHS except for risk-taking decreased over three years between participants’ last semester and after graduation (Kim et al., 2017; Yang et al., 2017). Multiple studies have indicated that life adjustment of college students changed depending on when data were collected (e.g., Ahmed et al., 2017; Gall et al., 2000). One longitudinal study indicated that PHS predicted life adjustment and were positively associated with life adjustment (e.g., psychological well-being, life satisfaction, adaptation to college; Kim et al., 2018). Therefore, age and year of study of participants may contribute to the discrepancy of PHS levels among college students.

Gender

Gender may explain the differences in PHS levels among college students. A study with 4th-year undergraduate students in South Korea shows that male participants had higher PHS levels in two dimensions (i.e., persistence and risk-taking) compared to their female counterparts (Kim et al., 2018). Moreover, research findings demonstrated a significant and positive correlation between PHS and CDMSE (Kim et al., 2014, 2015). However, findings on the relationship between gender and CDMSE have been inconclusive. Some studies did not find a significant difference in the level of CDMSE based on gender (Chung, 2002; Jiang, 2014).
whereas other studies found that gender significantly predicted the level of CDMSE (Bolat & Odaci, 2017; Gianakos, 2001).

Another reason why gender is worth evaluating as a variable that influences PHS is due to its relationship with career barriers. The evidence that women perceived significantly greater career-related barriers compared to men is conclusive (Cardoso & Marques, 2008; Fort & Murariu, 2018; Luzzo & McWhirter, 2001; Watts et al., 2015). These studies found that the most common career barriers reported were sexual discrimination and conflict between professional and family roles. Higher scores in perceived career barriers were associated with lower scores of PHS (Yang et al., 2017). Therefore, gender may explain different levels of PHS among college students.

**Race/Ethnicity**

Similar to gender, multiple studies have indicated a significant relationship between race/ethnicity with perceived career barriers (e.g., Cardoso & Marques, 2008; Lopez & Ann-Yi, 2006; Luzzo & McWhirter, 2001). All of these studies were conducted with youth and young adults in the general population. One study revealed that undergraduate students from ethnic minorities (i.e., Black, Asian, Latinx, and Native Americans) exhibited more perceived career-related barriers compared to their White counterparts (Luzzo & McWhirter, 2001). Within the intersectionality between gender and race, Black women perceived greater career barriers than White and Latina women (Lopez & Ann-Yi, 2006). Given that perceived career barriers were negatively associated with PHS (Yang et al., 2017), race/ethnicity should be taken into account in research that is focused on the influence of PHS.
Opportunities are inequitably available to people across SES levels, and therefore income level may have an important influence on the quality and quantity of happenstances and career aspirations. Career aspiration refers to the desire to develop career goals and plans through continuous education (O’Brien & Fassinger, 1993). SES has been reported to be a significant predictor of career aspirations (Ashby & Schoon, 2010; Howard et al., 2011; Schoon & Parsons, 2002). These studies, all of which focused on the general population, revealed that youth with higher SES reported higher career aspirations. In addition, youth from higher SES family background aspired to occupations with higher levels of social prestige, education requirements, and median salary (Howard et al., 2011). Career aspiration also has a significant relationship with PHS; specifically, it is positively associated with four out of five dimensions in PHS (i.e., curiosity, persistence, optimism, risk-taking; Yang et al., 2017). Therefore, SES may contribute to different levels of PHS and it is important to examine the significance of its influence.

**Purpose of the Study**

In summary, disability status has been associated with career-related constructs (i.e., CDMSE, perceived career barriers, and dysfunctional career thoughts) that impede career development (Dipeolu et al., 2013; Fabian et al., 2009; Luzzo et al., 1999). These career-related constructs have significant relationships with PHS. Furthermore, some demographic attributes have been reported to significantly predict career-related constructs (i.e., CDMSE, perceived career barriers, and career aspiration) that are associated with PHS (Ahmed et al., 2017; Howard et al., 2011; Luzzo & McWhirter, 2001; Watts et al., 2015). However, the extent to which PHS can be explained by disability status and demographic attributes (i.e., age, year of study, gender,
race/ethnicity, SES) remains unexamined. Therefore, this study was designed to answer the following questions:

(1) To what extent can variance in the PHCI-E scores of college students with and without disabilities be predicted by baseline covariates (i.e., age, year of study, gender, race/ethnicity, SES), as indicated by the coefficient of determination ($R^2$) value?

(2) After controlling for key covariates, what is the magnitude of the difference in the PHCI-E scores of college students based on disability status, as measured by Hedges’ $g$?

**Method**

**Participants**

For this study, two groups of participants were recruited at two four-year public universities in the Midwest region of the U.S. Inclusion criteria for participants in both groups were undergraduate students who were enrolled full-time and attending a degree-seeking program. Group 1 represented college students with disabilities and was recruited through emails sent by the Student Access Service offices. Participants were categorized in Group 1 when they met the inclusion criteria and were registered at the Student Access Services to receive accommodations due to permanent disability status. Group 2 represented college students without disabilities. I recruited participants for Group 2 through a variety of methods: (a) class visit recruitments, (b) recruitment emails via the Graduate Teaching Assistant network, (c) fliers and posters, and (d) SONA Systems© (2019) process, which offered research participation opportunities to college students. Participants were categorized in Group 2 when they met the inclusion criteria, not registered at the Student Access Services, and never received an Individualized Education Program (IEP) or Section 504 Plan during their K-12 education.
A total of 424 college students participated, but only 323 participants’ responses were analyzed (see Figure 1). Group 1 consisted of 148 college students with disabilities, and Group 2 consisted of 175 college students without disabilities. Overall, the participants’ age ranged from 18 to 50, with a mean age of 20.84 (SD = 3.46). Table 3.1 presents the sociodemographic characteristics of the participants in each group, and Table 3.2 presents disability-related conditions identified by the participants in Group 1. I conducted a Chi-square analysis to examine how well the race/ethnicity proportion in the sample generalized to the population as reported by the National Center for Education Statistics (2019). The result indicated that the sample proportions were significantly different from the population proportions ($\chi^2 [df = 5] = 94.444, p < .001$). Proportions of participants’ gender were not analyzed because this study had three categories of gender (i.e., female, male, and non-binary), and census data only reported two categories. Other key demographic variables (i.e., SES, age, and year of study) were not analyzed because census data did not report these key demographic variables.

**Instruments**

**Demographic status**

Participants reported their demographic characteristics on a brief questionnaire that included the following variables: age, year of study, gender, race/ethnicity, SES, disability status. Participants self-identified their disability status and areas of accommodations received from the Student Access Service. Participants were not required to provide any documentation as evidence of permanent disability status.

**Planned happenstance skills**

The revised version of PHCI-E (Lee et al., 2017) was used to assess the level of PHS among college students with and without disabilities. The revision was based on suggestions
from experts who provided the content validity of the instrument in the first study of this
dissertation project. This scale consists of 25 items measuring the five dimensions of PHS: (a)
Curiosity (e.g., “I am curious to know what happens around me by chance”), (b) Flexibility (e.g.,
“I think my career path can change at any time in my life”), (c) Persistence (e.g., “I will keep
putting efforts despite unexpected difficulties”), (d) Optimism (e.g., “I have a positive view of
my future career path”), and (e) Risk-taking (e.g., “I am willing to take risks and try even if the
outcome is uncertain”). Five items are related to each dimension, and each item is scored on a 5-
point Likert scale, ranging from 1 (never true) to 5 (always true).

The study in Chapter 2 of this dissertation examined the validity and reliability of the
PHCI-E and the OES-S among college students with disabilities. The findings from this study
indicated that the internal consistency reliability of the PHCI-E across five dimensions has
yielded Cronbach’s alpha ranging from .67 to .85. Evidence of construct validity of the PHCI-E
across five dimensions has been demonstrated through statistically significant and positive
correlations with the Career Decision-Making Self-Efficacy – Short Form (CDMSE-SF; Betz et
al., 1996).

**Procedures**

This research focused on: (a) the variance in the PHCI-E scores of college students
predicted by baseline covariates (i.e., age, year of study, gender, race/ethnicity, SES), and (b) the
magnitude of the differences in each dimension of the PHCI-E scores of college students based
on disability status. A university institutional review board approved the procedures prior to
participant recruitment. Participants from both groups provided unidentifiable demographic
information and completed an online survey consisting of 25 items of the revised PHCI-E.
**Variance in PHS Predicted by Demographic Attributes**

To answer the first research question, general linear regression analysis with stepwise selection was conducted using SAS 9.4 to identify which demographic covariates (i.e., age, year of study, gender, race/ethnicity, SES) meaningfully predicted the variability of each PHS dimension. To avoid model overfitting and underfitting during model selection, stepwise selection was guided by substantive improvements in model fit, as indexed by the change in Bayesian Information Criteria. All default settings in the procedure were used for greater replicability. In addition, the coefficient of determination ($R^2$) value for the final models resulting from stepwise selection indicated the extent to which it predicted variance in each dimension of the PHCI-E scores of college students with and without disabilities. I interpreted $R^2$ value following the conventional criteria (Cohen, 1988): less than 0.12 as weak, 0.13 to 0.25 as medium, and 0.26 and higher as large.

**Magnitude of the Differences in PHS of College Students Based on Disability Status**

To answer the second research question, I performed a series of factorial ANOVAs (controlling for key demographic covariates) using IBM SPSS Statistics (Version 25) to determine whether there were any statistically significant differences in the PHCI-E scores in each dimension between college students with and without disabilities. Before interpreting the results of factorial ANOVAs, I performed diagnostics to check critical test assumptions (e.g., homogeneity, normalcy, and multicollinearity). During diagnostics, I detected outliers by inspecting boxplot for values greater than 3 box-lengths from the edge of the box and ran a sensitivity analysis to assess their influence on inferences. If influential, I reported results with and without outliers side-by-side for comparison. Lastly, I used Hedges’ $g$ as my effect size to determine the practical significance of the group mean differences in the PHCI-E in each
dimension. I interpreted Hedges’ $g$ using the conventional standards (Hedges, 1981): less than 0.49 as small, 0.5 to 0.79 as medium, and 0.8 and higher as large.

**Results**

There were 148 and 175 college students with and without disabilities who participated in the study, respectively. The average PHCI-E scores in four out of five dimensions: curiosity, flexibility, persistence, and risk-taking were higher for college students with disabilities. College students without disabilities scored higher only in the optimism dimension. Table 3.3 presents the means and standard deviations of PHCI-E scores in each dimension for each group. In this section, I present the results of stepwise selection and ANOVA for each dimension of PHS (see Table 3.4).

**Curiosity**

The mean curiosity scores of participants with disabilities was 3.954, whereas the mean scores of participants without disabilities was 3.818. A factorial ANOVA with covariates determined by stepwise regression tested whether this difference was statistically significant. Stepwise selection identified disability status, gender, race/ethnicity, and the interaction between gender and race/ethnicity as important covariates to consider. These selected covariates collectively predicted 6.9% of the variance in the PHCI-E curiosity scores, $R^2 = .069$. Using the conventional standards (Cohen, 1988), this $R^2$ value was weak. Consequently, the factorial ANOVA tested group mean differences of participants (with disabilities vs. without disabilities) after controlling for gender, race/ethnicity, and their interaction. The $F$-test indicated that the group mean difference was statistically significant, $F(1, 312) = 3.958$, $p = .048$. Using the conventional standards (Hedges, 1981), the magnitude of this difference is considered small (Hedges’ $g = .025$). Importantly, although diagnostic assessment indicated that there were seven
outliers, the group differences remained statistically significant \( (p = .026) \) even if these outliers were removed (these results are not shown but available upon request).

**Flexibility**

The mean flexibility scores of participants with disabilities was 3.307, whereas the mean scores of participants without disabilities was 3.298. Stepwise selection identified gender, race/ethnicity, and the interaction between the two variables as important baseline covariates to consider. These selected covariates collectively predicted the 7.4% of the variance in the PHCI-E flexibility scores, \( R^2 = .074 \). Using the conventional standards (Cohen, 1988), this \( R^2 \) value was weak. Consequently, the factorial ANOVA tested group mean differences of participants (with disabilities vs. without disabilities) after controlling for gender, race/ethnicity, and their interaction. The \( F \)-test indicated that the group mean difference was not statistically significant, \( F(1, 312) = .011, p = .917 \). Using the conventional standards (Hedges, 1981), the magnitude of this difference is considered small (Hedges’ \( g = .067 \)). Importantly, although diagnostic assessment indicated that there were three outliers, the group differences remained statistically non-significant \( (p = .979) \) even if these outliers were removed (these results are not shown but available upon request).

**Persistence**

The mean persistence scores of participants with disabilities was 4.119, whereas the mean scores of participants without disabilities was 4.025. Stepwise selection identified race/ethnicity as an important covariate to consider. This selected covariate predicted 3.7% of the variance in the PHCI-E persistence scores, \( R^2 = .037 \). Using the conventional standards (Cohen, 1988), this \( R^2 \) value was weak. Consequently, the factorial ANOVA tested group mean differences of participants (with disabilities vs. without disabilities) after controlling for race/ethnicity. The \( F \)-
test indicated that the group mean difference was non-significant, $F(1, 323) = .001, p = .264$.

Using the conventional standards (Hedges, 1981), the magnitude of this difference is considered small (Hedges’ $g = .128$). Importantly, although diagnostic assessment indicated that there were three outliers, the group differences remained statistically non-significant ($p = .362$) even if these outliers were removed (these results are not shown but available upon request).

**Optimism**

The mean optimism scores of participants with disabilities was 4.054, whereas the mean scores of participants without disabilities was 4.165. Stepwise selection identified disability status, year of study, and their interaction as important covariates to consider. These selected covariates collectively predicted 7.3% of the variance in the PHCI-E optimism scores, $R^2 = .073$. Using the conventional standards (Cohen, 1988), this $R^2$ value was weak. Consequently, the factorial ANOVA tested group mean differences of participants (with disabilities vs. without disabilities) after controlling for year of study and the interaction between year of study and disability status. The $F$-test indicated that the group mean difference was statistically significant, $F(1, 313) = 7.521, p = .006$. Using the conventional standards (Hedges, 1981), the magnitude of this difference is considered small (Hedges’ $g = .234$). Importantly, although diagnostic assessment indicated that there were two outliers, the group differences remained statistically significant ($p = .002$) even if these outliers were removed (these results are not shown but available upon request).

The interaction between disability status and year of study significantly predicted the variance in the PHCI-E optimism scores. Therefore, I ran pairwise comparisons for disability status and year of study with reported 95% confidence interval and $p$-values Bonferronni-adjusted. There were no statistically significant differences in optimism scores between college
student with and without disabilities at year 1, $F(1, 313) = .029, p = .865$, year 2, $F(1, 313) = .002, p = .962$, year 3, $F(1, 313) = 1.659, p = .199$, and year 4, $F(1, 313) = .015, p = .903$. There was a statistically significant difference between college students with and without disabilities at year 5 or higher, $F(1, 313) = 12.884, p < .001$. Using the conventional standards (Hedges, 1981), the magnitude of this difference is considered large, (Hedges’ $g = 1.450$).

**Risk-Taking**

The mean risk-taking scores of participants with disabilities was 3.987, whereas the mean scores of participants without disabilities was 3.849. Stepwise selection identified race/ethnicity as an important covariate to consider. This selected covariate predicted 4.1% of the variance in the PHCI-E risk-taking, $R^2 = .041$. Using the conventional standards (Cohen, 1988), this $R^2$ value was weak. Consequently, the factorial ANOVA tested group mean differences of participants (with disabilities vs. without disabilities) after controlling for race/ethnicity. The $F$-test indicated that the group mean difference was statistically non-significant, $F(1, 318) = 2.501, p = .115$. Using the conventional standards (Hedges, 1981), the magnitude of this difference is considered small (Hedges’ $g = .149$). Importantly, although diagnostic assessment indicated that there was one outlier, the group differences remained statistically non-significant ($p = .130$) even if this outlier was removed (these results are not shown but available upon request).

**Discussion**

The purpose of this study was twofold. First, this study was designed to identify variables that predicted the level of PHS among college students with and without disabilities. In general, disability status, gender, race/ethnicity, and year of study were identified as significant predictors of PHS level. Race/ethnicity was the variable that predicted most dimensions of PHS (i.e., curiosity, flexibility, persistence, and risk-taking). Disability status was one of the covariates that
predicted PHS level in the curiosity and optimism dimensions. Gender was a significant predictor when the variable interacted with race/ethnicity, and the interaction between the two variables predicted two dimensions of PHS (i.e., curiosity and flexibility). Year of study only emerged as a significant predictor of optimism. The finding indicating that gender and year of study predicted PHS level aligned with the findings from previous studies (Kim et al., 2017; Yang et al., 2017). However, Kim et al. found that persistence and risk-taking levels were different between male and female college students in South Korea, instead of curiosity and flexibility as this study found. To my knowledge, this is the first study that examined the role of race/ethnicity and disability status in PHS level.

Second, this study examined the magnitude of differences of PHS in each dimension between college students with and without disabilities after controlling for the key covariates. College students with disabilities in this study generally exhibited a similar and slightly higher PHS level compared to their counterparts without disabilities. Although college students with disabilities exhibited a higher level of PHS in four out of five dimensions (i.e., curiosity, flexibility, persistence, and risk-taking), the only statistically significant difference was in the curiosity dimension. Optimism was the only dimension in which the college students with disabilities exhibited a lower level of PHS, and the difference was statistically significant. Although the group mean differences in two of the five dimensions (i.e., curiosity and optimism) were in fact statistically significant, the estimated magnitude of those differences was almost null – i.e., the group means in the population of college students with disabilities and without disabilities appear to be practically equivalent across every dimension.

These findings were in contrast to previous studies that reported college students with disabilities exhibited levels of career-related constructs (e.g., CDMSE, dysfunctional career
thoughts due to external conflict) that were less advantageous compared to their counterparts without disabilities (e.g., Dipeolu et al., 2002; Luzzo et al., 1999). Possible explanations for the similar level of PHS between the two groups in this study is the unique experience of college students with disabilities in this sample and the time period in which data were collected. This sample included students at two research universities where admission is competitive, and data were collected in early 2020. To receive accommodations in college, the students with disabilities in this sample had been required to disclose their disability to a Student Access Services office and discuss the accommodations they needed with their instructors during the course of their college education. Thus, the college students with disabilities in the current study had to use skills to seek information, services, and support as needed (Skinner, 2004), and these skills align with the curiosity dimension in PHS.

Furthermore, self-determination skills were identified as the key to overcome disability-specific obstacles in postsecondary settings (e.g., Garner, 2008; Garrison-Wade, 2012; Shogren et al., 2018). Self-determination skills include goal-setting and problem-solving components (Lee et al., 2015; Wehmeyer et al., 2000), and the skills required to set a goal and solve problems align with persistence and flexibility in PHS. Prior studies may have included a greater cross-section of students with disabilities at a greater cross-section of academic institutions, and data were collected during a time where accommodations for students with disabilities were not as well known or established. These factors may have contributed to the discrepancies in findings between this study and prior investigations. A potential area for future research is to focus more closely on learning from the experiences of successful college students with disabilities who have strong PHS (such as the students in this sample), and to identify how to nurture personal characteristics as well as other factors that contribute to their success.
Another important finding in this study was that college students with disabilities exhibited significantly lower levels of optimism. Moreover, the interaction between disability status and year of study also significantly predicted the level of optimism. In other words, the significance and magnitude of the difference in optimism level between the two groups depended on the group’s year of study. Only college students with disabilities at year 5 or higher exhibited a significantly lower level of optimism compared to their counterparts without disabilities.

Although these findings are difficult to interpret as substantive due to the small sample size of participants at year 5 or higher (participants with disabilities = 14, participants without disabilities = 7), the findings aligned with the previous studies (Kim et al., 2017; Yang et al., 2017) indicating that the overall PHS level decreased over time for 4th-year college students who were close to graduation or just graduated. However, these previous studies were longitudinal studies that only involved college students in their senior year and did not report any disability status.

There are two possible explanations of why college students with disabilities exhibited a significantly lower level of optimism compared to their counterparts without disabilities. First, optimism is negatively correlated with perceived career barriers (Yang et al., 2017), and perceived career barriers are positively correlated with hopelessness (Chronister & McWhirter, 2003; London, 2014). Studies indicated that youth with disabilities in general exhibited a level of perceived career barriers that hinder their career development process (Fabian et al., 2009; Gibbons et al., 2015; Punch et al., 2006). Moreover, a qualitative study revealed that college students with disabilities were discouraged about their employment outcomes despite their participation in degree-seeking programs (Hong, 2015). These levels of perceived career barriers and hopelessness may explain the low level of optimism exhibited by participants with
disabilities in this study. In other words, college students with disabilities appear to be optimistic about their opportunities to succeed in college but less optimistic about their opportunities to succeed after college.

Second, Kim et al. (2014) reported a positive correlation between overall PHS and CDMSE, and the study in Chapter 1 of this dissertation confirmed that optimism yielded a moderate and positive correlation with CDMSE. Ulas and Yildirim (2019) reported that the CDMSE level decreased among final year undergraduate students without disabilities in Turkey as their hopelessness increased. The CDMSE level decreased even more when the participants exhibited an external locus of control. Luzzo et al. (1999) reported that college students with disabilities exhibited a lower level of CDMSE compared to their counterparts without disabilities. Furthermore, youth with disabilities in general (Shogren et al., 2010) and college students with disabilities (Hall et al., 2002) exhibited a more external locus of control when compared to their counterparts without disabilities. These levels of CDMSE and locus of control among youth with disabilities may explain the low optimism level of participants with disabilities approaching their final year in this study.

Limitations

Although the present findings reveal the differences in five dimensions of PHS among college students based on disability status appear negligible, several limitations need to be considered. First, some assumptions to run a factorial ANOVA were not met, such as outliers, normal distribution of data, and homogeneity of variances. I addressed the detected outliers by removing them and rerunning the ANOVA tests, and the results were similar to the previous ones before outliers were removed. However, I decided to deal differently with the violations of the assumptions of normal distribution of data and homogeneity of variance for this following...
reason. Although this condition meant that it should be easier to reject the null hypothesis than I intended (i.e., the obtained $p$ values, albeit approximate, were actually too small), even so, the tests still failed to reject the null. This failure to reject the null is thus telling. It means that, even without bothering with the violations, the data still appeared consistent with null. This does not mean that we can therefore accept the null. It only means the null cannot be ruled out from this data and tweaking the test to get a more exact $p$ value – at least, in this case – will not change this inferential outcome.

Second, the generalization of the findings in this study should be done with caution. There were statistically significant differences in proportions of gender ($p = .983$), race/ethnicity ($p = .055$), and annual household income ($p = .077$) between the two groups of participants. However, there was no statistically significant difference in the proportion of year of study between the two groups ($p = .005$). Moreover, the current sample showed statistically significant differences ($\chi^2 [df = 3] = 76.095, p < .001$), when compared to the census data (National Center for Education Statistics, 2019). In particular, White college students with and without disabilities were overrepresented. However, these preliminary findings align with findings from previous studies examining the unique experiences of college students with disabilities that built their strengths. Therefore, this study contributes knowledge and addresses the gap in the literature emphasizing the strengths of college students with disabilities.
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https://doi.org/10.1002/j.2161-0045.2014.00070.x


Figure 3.1

Flowchart of Participants

Participated (n = 424)

Excluded (n = 36) for not meeting inclusion criteria (i.e., not attending undergraduate degree-seeking program and/or enrolled part-time)

Met the inclusion criteria (n = 388)

Excluded (n = 65)
- Did not meet any group category criteria (n = 32)
- Did not complete the survey (n = 33)

Analyzed (n = 323)

College students with disabilities (n = 148)

College students without disabilities (n = 175)
Table 3.1

Demographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Baseline characteristics</th>
<th>With disabilities</th>
<th>Without disabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>98</td>
<td>30.3</td>
</tr>
<tr>
<td>Male</td>
<td>45</td>
<td>13.9</td>
</tr>
<tr>
<td>Non-binary</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Year of Study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>28</td>
<td>8.7</td>
</tr>
<tr>
<td>Year 2</td>
<td>31</td>
<td>9.6</td>
</tr>
<tr>
<td>Year 3</td>
<td>44</td>
<td>13.6</td>
</tr>
<tr>
<td>Year 4</td>
<td>31</td>
<td>9.6</td>
</tr>
<tr>
<td>Year 5 or higher</td>
<td>14</td>
<td>4.3</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>7</td>
<td>2.2</td>
</tr>
<tr>
<td>Black</td>
<td>9</td>
<td>2.8</td>
</tr>
<tr>
<td>White</td>
<td>115</td>
<td>35.6</td>
</tr>
<tr>
<td>Others</td>
<td>17</td>
<td>5.3</td>
</tr>
<tr>
<td>Household Annual Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $20,000</td>
<td>11</td>
<td>3.4</td>
</tr>
<tr>
<td>Between $20,000 - $79,999</td>
<td>39</td>
<td>12.1</td>
</tr>
<tr>
<td>Between $80,000 - $139,999</td>
<td>42</td>
<td>13.0</td>
</tr>
<tr>
<td>Between $140,000 - $199,999</td>
<td>15</td>
<td>4.6</td>
</tr>
<tr>
<td>More than $200,000</td>
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<td>3.1</td>
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<tr>
<td>Unknown</td>
<td>31</td>
<td>9.6</td>
</tr>
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</table>
Table 3.2

Disabilities Conditions of Participants

<table>
<thead>
<tr>
<th>Disability conditions</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHD</td>
<td>52</td>
</tr>
<tr>
<td>Mental health</td>
<td>52</td>
</tr>
<tr>
<td>Learning disability</td>
<td>35</td>
</tr>
<tr>
<td>Medical needs</td>
<td>24</td>
</tr>
<tr>
<td>Others (e.g., seizures, obsessive compulsive disorder)</td>
<td>20</td>
</tr>
<tr>
<td>Mobility</td>
<td>16</td>
</tr>
<tr>
<td>Intellectual/cognitive</td>
<td>10</td>
</tr>
<tr>
<td>Acquired brain injury</td>
<td>7</td>
</tr>
<tr>
<td>Hearing</td>
<td>7</td>
</tr>
<tr>
<td>Vision</td>
<td>5</td>
</tr>
<tr>
<td>Autism</td>
<td>3</td>
</tr>
<tr>
<td>Speech/language</td>
<td>2</td>
</tr>
</tbody>
</table>

*Note. This total n in this table is more than the number of participants with disabilities (n = 148) because participants were allowed to report more than one disability conditions.*
Table 3.3

Means and Standard Deviations of PHS among Participants

<table>
<thead>
<tr>
<th>PHS dimension</th>
<th>With Disabilities</th>
<th>Without Disabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Curiosity</td>
<td>3.954</td>
<td>0.58</td>
</tr>
<tr>
<td>Flexibility</td>
<td>3.307</td>
<td>0.74</td>
</tr>
<tr>
<td>Persistence</td>
<td>4.119</td>
<td>0.55</td>
</tr>
<tr>
<td>Optimism</td>
<td>4.054</td>
<td>0.70</td>
</tr>
<tr>
<td>Risk-taking</td>
<td>3.987</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Note. $M$ indicates mean. $SD$ indicates standard deviation.
Table 3.4

ANOVA Results with Outliers Included

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Predictors</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Intercept)</td>
<td>680.325</td>
<td>1</td>
<td>680.325</td>
<td>2192.279</td>
<td>.000**</td>
</tr>
<tr>
<td>Curiosity</td>
<td>Disability status</td>
<td>1.228</td>
<td>1</td>
<td>1.228</td>
<td>3.958</td>
<td>.048*</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>1.606</td>
<td>2</td>
<td>.803</td>
<td>2.587</td>
<td>.077</td>
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<tr>
<td></td>
<td>Race</td>
<td>.354</td>
<td>3</td>
<td>.118</td>
<td>.381</td>
<td>.767</td>
</tr>
<tr>
<td></td>
<td>Gender x Race/ethnicity</td>
<td>1.440</td>
<td>4</td>
<td>.360</td>
<td>1.160</td>
<td>.328</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>96.822</td>
<td>312</td>
<td>.310</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Intercept)</td>
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<td>1</td>
<td>581.680</td>
<td>1015.191</td>
<td>.000**</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Disability status</td>
<td>.006</td>
<td>1</td>
<td>.006</td>
<td>.011</td>
<td>.917</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>2.512</td>
<td>2</td>
<td>1.256</td>
<td>2.192</td>
<td>.113</td>
</tr>
<tr>
<td></td>
<td>Race/ethnicity</td>
<td>1.392</td>
<td>3</td>
<td>.464</td>
<td>.810</td>
<td>.489</td>
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<tr>
<td></td>
<td>Gender x Race/ethnicity</td>
<td>4.714</td>
<td>4</td>
<td>1.179</td>
<td>2.057</td>
<td>.086</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>178.769</td>
<td>312</td>
<td>.573</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Intercept)</td>
<td>2156.929</td>
<td>1</td>
<td>2156.929</td>
<td>7390.260</td>
<td>.000**</td>
</tr>
<tr>
<td>Persistence</td>
<td>Disability status</td>
<td>.366</td>
<td>1</td>
<td>.366</td>
<td>1.254</td>
<td>.264</td>
</tr>
<tr>
<td></td>
<td>Race/ethnicity</td>
<td>3.225</td>
<td>3</td>
<td>1.075</td>
<td>3.683</td>
<td>.012*</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>5442.240</td>
<td>318</td>
<td>.292</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Intercept)</td>
<td>3709.578</td>
<td>1</td>
<td>3709.578</td>
<td>9680.509</td>
<td>.000**</td>
</tr>
<tr>
<td>Optimism</td>
<td>Disability status</td>
<td>2.882</td>
<td>1</td>
<td>2.882</td>
<td>7.521</td>
<td>.006*</td>
</tr>
<tr>
<td></td>
<td>Year of study</td>
<td>2.314</td>
<td>4</td>
<td>.578</td>
<td>1.510</td>
<td>.199</td>
</tr>
<tr>
<td></td>
<td>Disability status x Year of study</td>
<td>4.709</td>
<td>4</td>
<td>1.177</td>
<td>3.072</td>
<td>.017*</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>119.942</td>
<td>313</td>
<td>.383</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Intercept)</td>
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<td>1</td>
<td>2000.769</td>
<td>5891.247</td>
<td>.000**</td>
</tr>
<tr>
<td>Risk-taking</td>
<td>Disability status</td>
<td>.849</td>
<td>1</td>
<td>.849</td>
<td>2.501</td>
<td>.115</td>
</tr>
<tr>
<td></td>
<td>Race/ethnicity</td>
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<td>3</td>
<td>1.331</td>
<td>3.918</td>
<td>.009*</td>
</tr>
<tr>
<td></td>
<td>Error</td>
<td>107.998</td>
<td>318</td>
<td>.340</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. df indicates degree of freedom.*

*p < .05. **p < .001.
Chapter 4: Relationship between Planned Happenstance Skills and Occupational Engagement among College Students with Disabilities

The first purpose of this chapter is to explain why it is important to develop planned happenstance skills (PHS) and occupational engagement as adaptive career decision-making skills. Second, I summarize the existing literature on PHS and occupational engagement. Third, I present the purpose of the study and the research questions the study aims to answer. Fourth, I describe the research methods and data analysis procedures. Finally, I present and discuss the findings.

Exploring career options and making career-related decisions are important life tasks for college students (Phillips & Blustein, 1994). Yet, relatively little is known about the career decision-making process of college students with disabilities (Luzzo et al., 1999). Studies show that youth with disabilities experience more limited career development activities compared to peers without disabilities (Carter et al., 2010; Hitchings et al., 2001). Furthermore, prior research findings have shown that the career decision processes of youth with disabilities are impeded due to limitations in career decision-making self-efficacy (Luzzo et al., 1999), perceived career barriers (Fabian et al., 2009; Punch et al., 2006), and dysfunctional career thoughts (Dipeolu et al., 2002; 2013), all of which impede the career decision-making process.

In today’s everchanging workplace, youth with disabilities are at a higher risk for difficulties adjusting to an unpredictable future job market in several ways (Hafner & Owens, 2008). First, only a few instructional methods for youth with disabilities focus on developing skills necessary for career decision-making, (e.g., Wehmeyer et al., 2000; Wehmeyer & Lawrence, 1995). Second, employment skills, such as clerical and assembly tasks, that are often taught to youth with disabilities are often not transferable in different job settings (Gilson et al.,
Finally, the types of jobs available to people with disabilities, even with a bachelor’s degree, are typically at an entry level and are limited in variety (Kaye, 2009; Newman et al., 2011; Roux et al., 2013). Specifically, employees with disabilities are overrepresented in entry-level and unskilled occupations, which typically offer lower wages and fewer benefits.

College students with disabilities who had greater exposure to work experiences and more contact with people in specific occupations reported higher and more specific career aspirations (Hitchings et al., 2001). This finding aligns with adaptive career decision-making theories that emphasize the importance of exposure to different experiences and occupational engagement (e.g., Krieshok et al., 2009; Krumboltz, 2009; Mitchell et al., 1999). For instance, Mitchell et al. (1999) asserted that unplanned events have a significant influence on the career decision-making process. Further, career decision-makers need to develop skills, (i.e., planned happenstance skills [PHS]) to use unplanned events as positive career development opportunities. Another salient component in the adaptive career decision-making process is occupational engagement (Cox et al., 2015; Krieshok et al., 2009). Cox et al. (2007) contended that people who are engaged and adaptable in an uncertain job market have more satisfying and fulfilling careers. Therefore, the purpose of this study is to provide information about the relationship between PHS and occupational engagement among college students with disabilities.

**Planned Happenstance Skills**

PHS refer to a set of skills to generate and utilize happenstances to develop new knowledge, interests, and skills that are beneficial to the career decision-making process (Mitchell et al., 1999). PHS consist of five related skill areas: (a) *curiosity* - exploring new learning opportunities; (b) *persistence* - exerting ongoing effort despite setbacks; (c) *optimism* -
viewing new opportunities as possible and attainable; (d) *flexibility* - adapting to changing attitudes and circumstances; and (e) *risk-taking* - taking actions in the face of uncertainty (Mitchell et al., 1999). The instrument to measure PHS, the Planned Happenstance Career Inventory (PHCI), was developed in South Korea (Kim, Jung, et al., 2014). To date, most studies on PHS have been conducted with South Korean high school and college students who do not have disabilities (e.g., Ahn et al., 2015; Kim, Jang, et al., 2014). The PHCI has been translated into English and this version has yielded psychometrically reliable and valid assessment results when used with college students in the U.S. (Lee et al., 2017). The findings from a previously reported study that is a part of this dissertation provided evidence of the extent to which the PHCI English version (PHCI-E) demonstrated validity and reliability when used with college students with disabilities (see Chapter 2).

Multiple studies show that PHS have been linked with an array of career-related constructs (e.g., Kim, Jang, et al., 2014; Kim et al., 2017). College students with higher levels of PHS demonstrated lower levels of career stress (Kim, Jang, et al., 2014). Further, PHS were associated with higher levels of career decision-making self-efficacy, occupational engagement among undergraduate students in South Korea (Kim, Jang, et al., 2014; Kim, Jung, et al., 2014), and more advanced vocational identity status among undergraduate and high-school students in South Korea (Ahn et al., 2015; Rhee et al., 2016). People with more advanced occupational identity status are reported to have higher job and life satisfaction (Hirschi, 2011). The longitudinal study on PHS (Kim et al., 2017; Yang et al., 2017) emphasized that PHS are especially important as young adults make the transition from school-to-work.
**Occupational Engagement**

Simply stated, occupational engagement refers to behaviors that increase one’s fund of information and experience to support the career-related decision-making process (Cox et al., 2015). Occupational engagement has two sub-components: exploration and enrichment (Krieshok et al., 2009), where exploration refers to one’s actions in gathering information to make a career-related decision, and enrichment refers to participating in activities to help someone better understand about themselves and the world in which they interact. The aim of exploration is a career decision; thus, it ends when a decision is made. The aim of enrichment is to develop informed decision making at various points in the future.

Research has demonstrated that occupational engagement is positively correlated with other career-related constructs that support the career decision-making process (e.g., Cox et al., 2016; Duve, 2015). Findings from previous research suggested that occupational engagement predicted the readiness of student veterans to engage in career planning activities (Ghosh & Fouad, 2016), as well as academic major satisfaction among college students (Cox et al., 2016). Findings further suggested the presence of a significant correlation between people’s occupational engagement and their internal career locus of control (Duve, 2015), life satisfaction, vocational identity, hope, and personal growth (Vuyk et al., 2019). Occupational engagement has also been shown to have a significant positive correlation with PHS (Kim, Jang, et al., 2014). Specifically, Kim, Jang, et al. found that college students with high levels of PHS had greater occupational engagement, which strengthened their career decision certainty via career decision-making self-efficacy.
Purpose of the Study

It is important to reemphasize that all of the studies mentioned previously were conducted with college students without disabilities. Findings from the studies in the first chapter of this dissertation indicated that the instruments to measure PHS (i.e., the PHCI-E; Lee et al., 2017) and occupational engagement (Occupational Engagement Scale – Student [OES-S]; Cox et al., 2015) were also reliable and valid to use college students with disabilities. This study constitutes the next logical step in this research line. The purpose of this study was to investigate the extent to which PHS predict occupational engagement among college students with disabilities. Specifically, the research questions were:

(1) Are PHS a statistically significant predictor of occupational engagement?

(2) What proportion of variance in occupational engagement is predicted by PHS, as indicated by the coefficient of determination ($R^2$) value?

Method

Participants

For this study, participants were recruited at two four-year public universities in the Midwest region of the U.S. Potential participants received recruitment emails through their university’s Office of Student Access Services. The inclusion criteria for participants were: (a) enrolled full-time, (b) attending an undergraduate degree-seeking program, and (c) registered at the Student Access Services to receive accommodations due to permanent disability status. A total of 232 undergraduate students participated. However, 68 participants were excluded because they did not meet the inclusion criteria and 16 participants were excluded because they did not complete the PHCI-E and the OES-S items. In total, responses from 148 participants were used for data analysis. The participants had a mean age of 21.78 years ($SD = 4.70$). Table
4.1 presents the sociodemographic characteristics of the participants, and Table 4.2 presents disability-related conditions identified by the participants that elicited their needs for accommodations while attending their university.

**Instruments**

*Planned happenstance skills*

The revised version of PHCI-E (Lee et al., 2017) was used to assess PHS among college students. The revision was based on suggestions from an expert panel who provided the content validity of the instrument in the first study of this dissertation project. This scale consists of 25 items measuring the five dimensions of PHS: (a) Curiosity (e.g., “I am curious to know what happens around me by chance”), (b) Flexibility (e.g., “I think my career path can change at any time in my life”), (c) Persistence (e.g., “I will keep putting efforts despite unexpected difficulties”), (d) Optimism (e.g., “I have a positive view of my future career path”), and (e) Risk-taking (e.g., “I am willing to take risks and try even if the outcome is uncertain”). Five items are related to each dimension, and each item is scored on a 5-point Likert scale, ranging from 1 (*never true*) to 5 (*always true*).

The study in the second chapter of this dissertation examined the validity and reliability of the PHCI-E among college students with disabilities. Findings from the study in Chapter 2 indicated that the internal consistency reliability of the PHCI-E across five dimensions has yielded Cronbach’s alpha ranging from .67 to .85. Evidence of construct validity of the PHCI-E across five dimensions has been demonstrated through statistically significant and positive correlations with the Career Decision-Making Self-Efficacy – Short Form (CDMSE-SF; Betz et al., 1996), ranging from .202 to .658.
**Occupational Engagement**

The revised version of the OES-S (Cox et al., 2015) was used to measure occupational engagement among college students. The revision was based on suggestions from experts who confirmed the content validity of the instrument in the first study of this dissertation project. This scale consists of nine single-factor items. Sample items include “I have contact with people working in the fields I find interesting” and “I participate in activities that I find interesting.” Each item is rated on a 5-point Likert scale, ranging from 1 (not at all like me) to 5 (very much like me). A total score (composite) is calculated by averaging the items, resulting in a range of possible scores from 1 (least possible occupational engagement) to 5 (most possible occupational engagement).

The first study in the second chapter of this dissertation provided evidence for the reliability and validity of the OES-S when used with college students with disabilities. Findings from the study in Chapter 2 indicated that the internal consistency reliability of the OES-S was evidenced by Cronbach’s alpha of .82 with the sample of college students with disabilities. Evidence of criterion validity of the OES-S was supported through the relationship between the OES-S scores and the CDMSE-SF (Betz et al., 1996), which yielded a statistically significant positive correlation ($r = .569, p < .01$).

**Procedures**

The procedures of this study were reviewed and approved by the University of Kansas Institutional Review Board. This research focused on the relationship between the PHCI-E and the OES-S scores among college students with disabilities. Participants were asked to self-report focal demographic information and complete an online survey consisting of 25 items of the PHCI-E and nine items of the OES-S. To determine the extent to which the PHCI-E scores in
each dimension can predict the OES-S scores among college students with disabilities, I conducted multiple regression analysis using IBM SPSS Statistics (Version 25). Specifically, I regressed occupational engagement on curiosity, flexibility, persistence, optimism, and risk-taking. The residuals were assumed to be normally distributed with zero mean and estimated variance. I evaluated and interpreted the $R^2$ value using the conventional standards (Cohen, 1988): less than 0.14 as small, 0.15 to 0.34 as medium, and 0.35 and higher as large.

In addition, I checked diagnostics before interpreting the model. A value greater than ±3 was the cut-off criteria used to define whether a particular residual was an outlier. Because outliers were detected during diagnostic checking, I ran a sensitivity analysis to determine whether the pattern of statistical significance for coefficients in the multiple regression analysis was meaningfully influenced by the decision to include or exclude outliers. The sample size was decreased from 148 to 145 after outliers were removed.

**Results**

I conducted a multiple regression analysis to determine the extent to which the set of five PHS predictors (i.e., curiosity, flexibility, persistence, optimism, and risk-taking) would predict occupational engagement outcomes among college students with disabilities. Multiple regression analysis indicated that the set of PHS improved model fit by a statistically significantly amount, $F(5, 142) = 26.419, p < .01, R^2 = .482$, with adjusted $R^2 = .464$. As a measure of effect size, an $R^2 = .482$ can be interpreted to mean that set of PHS predictors could predict 48.2% of the variance in the OES-S scores among college students with disabilities. Using the conventional standards (i.e., Cohen, 1988), this is considered to be a large effect.

Inspection of tests of regression beta weights indicated that four out of five PHS predictors (i.e., curiosity, persistence, optimism, and risk-taking) were statistically significant.
predictors of occupational engagement. Table 4.3 presents the regression coefficients and standard errors. All statistically significant predictors were in the expected positive direction, except risk-taking. The risk-taking dimension statistically significantly predicted occupational engagement in a negative direction. However, diagnostic analysis of residuals found three outliers (i.e., residuals greater than ±3 standard deviations). When these outliers were removed from the analysis, the risk-taking dimension was no longer statistically significant ($B = -1.61, p = .063$). However, the pattern of statistical significance remained stable for all other predictors after these three outliers were removed. Thus, the statistical significance of risk-taking was sensitive to the decision to include or exclude the three outliers.

**Discussion**

The purpose of this study was to examine the extent to which PHS predicts occupational engagement among college students with disabilities. Using multiple regression analysis, I analyzed the relationship between five dimensions of PHS as a set and occupational engagement. First, the results indicated that PHS dimensions as a set (i.e., composite scores) significantly predicted the level of occupational engagement. Specifically, the sample multiple correlation coefficient was .694, indicating that approximately 48.2% of the variance in the OES-S scores in the sample was accounted for by the linear combination of five dimensions of PHS. This result resembled findings with college students without disabilities in South Korea (Kim, Jang, et al., 2014), where data showed that there was a significant and positive correlation between PHS and occupational engagement. Moreover, this result aligned with the premise of happenstance learning theory (Krumboltz, 2009) which is foundational to PHS, where the importance of recognizing, creating, and utilizing unplanned events as career opportunities is emphasized. In
other words, college students with disabilities who are prepared and willing to seize new opportunities are more likely to be actively engaged in exploring career opportunities.

Second, the dimensions of curiosity, persistence, and optimism significantly predicted the variance of the OES-S scores even after outliers were removed. Among the three dimensions, optimism was the strongest predictor ($\beta = .443, p < .001$) of occupational engagement. With an increase of one standard deviation in optimism level, the OES-S score rose .443 standard deviations when the other variables were held constant. The second strongest predictor was curiosity ($\beta = .393, p < .001$), and the least strong predictor was persistence ($\beta = .234, p < .05$). This finding reinforces the importance of encouraging optimism among college students with disabilities in their engagement to seek career opportunities. Roessler et al. (2007) identified strategies to improve career development services and career optimism for college students with disabilities. These strategies included providing them with information on employment protection laws and policies, expanding their knowledge base of occupations of interests as well as disability-specific career services, providing interventions to promote self-advocacy and self-determination, and securing the involvement of key stakeholders. Implementing these strategies has the potential to increase the optimism of college students with disabilities and lead to higher occupational engagement among them.

**Limitations**

Although findings of this study demonstrated that PHS was a significant and substantial predictor of occupational engagement among college students with disabilities, this study had several limitations. First, the participants in this study were only recruited in two four-year public universities in the Midwest region. With respect to race, comparison of the current sample with census data reported by the National Center for Education Statistics (2019) showed statistically
significant differences ($\chi^2 [df = 5] = 53.643, p < .001$), indicating that the sample was less racially diverse than the national population. In particular, Black and Hispanic college students with disabilities were underrepresented. Therefore, without future research with more representative samples, some caution is warranted when generalizing findings to the national population. However, these preliminary findings align well with happenstance theory and therefore suggest that youth and young adults who possess PHS will be active in exploring career development opportunities.

Second, the self-report nature of the instruments might have distorted the participants’ responses (Heiman, 2002). Participants may have responded in a manner that would appear to meet the researcher’s or societal expectations, thus affected the findings. In addition, participants may have different interpretations of the various points on the Likert scale. Therefore, we cannot assume that the measurement difference between various points on the scales provide an even metric (e.g., it cannot be assumed that the amount of difference between points 1 and 2 is the same as between points 3 and 4). Future studies should address this limitation by using triangulation to include self and other stakeholders in completing the instruments’ items. Moreover, future investigations should incorporate qualitative data (e.g., interviewing participants) to address the limitation of Likert-scale responses.

Third, this research is a survey study to examine the extent PHS can predict the level of occupational engagement among college students with disabilities. This study provides an indication of the strength of the relationship between PHS and occupational engagement. However, the design does not permit causal inferences. For example, these findings cannot tell if greater occupational engagement leads to greater PHS, or if the relationship is reciprocal. In addition, measurement error is not accounted for in the model, but it could be accounted for with
a more advanced statistical test and bigger sample sizes. Future studies should examine other variables that may play a role in influencing occupational engagement among college students with disabilities (e.g., teachers/family expectations, supports, available services).
References


Table 4.1

Demographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Baseline characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
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<td></td>
</tr>
<tr>
<td>Female</td>
<td>98</td>
<td>66.2</td>
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<tr>
<td>Male</td>
<td>45</td>
<td>30.4</td>
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<tr>
<td>Non-binary</td>
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<td>3.4</td>
</tr>
<tr>
<td>Year of Study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>28</td>
<td>18.9</td>
</tr>
<tr>
<td>Year 2</td>
<td>31</td>
<td>20.9</td>
</tr>
<tr>
<td>Year 3</td>
<td>44</td>
<td>29.7</td>
</tr>
<tr>
<td>Year 4</td>
<td>31</td>
<td>20.9</td>
</tr>
<tr>
<td>Year 5 or higher</td>
<td>14</td>
<td>9.5</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
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<td>4.7</td>
</tr>
<tr>
<td>Black</td>
<td>9</td>
<td>6.1</td>
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<tr>
<td>Hispanic</td>
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<td>0.7</td>
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<tr>
<td>Native American</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
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<td>0.7</td>
</tr>
<tr>
<td>White</td>
<td>115</td>
<td>77.7</td>
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<tr>
<td>Biracial/Multiracial</td>
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<td>7.4</td>
</tr>
<tr>
<td>Other/Unknown</td>
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<td>0.7</td>
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<tr>
<td>Household Annual Income</td>
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<tr>
<td>Less than $20,000</td>
<td>11</td>
<td>7.4</td>
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<tr>
<td>Between $20,000 - $79,999</td>
<td>39</td>
<td>26.4</td>
</tr>
<tr>
<td>Between $80,000 - $139,999</td>
<td>42</td>
<td>28.4</td>
</tr>
<tr>
<td>Between $140,000 - $199,999</td>
<td>15</td>
<td>10.1</td>
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<tr>
<td>More than $200,000</td>
<td>10</td>
<td>6.8</td>
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<tr>
<td>Unknown</td>
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<td>20.9</td>
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Table 4.2

Disability Conditions of Participants

<table>
<thead>
<tr>
<th>Disability conditions</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ADHD</td>
<td>52</td>
</tr>
<tr>
<td>Mental health</td>
<td>52</td>
</tr>
<tr>
<td>Learning disability</td>
<td>35</td>
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<tr>
<td>Medical needs</td>
<td>24</td>
</tr>
<tr>
<td>Others (e.g., seizures, obsessive compulsive disorder)</td>
<td>20</td>
</tr>
<tr>
<td>Mobility</td>
<td>16</td>
</tr>
<tr>
<td>Intellectual/cognitive</td>
<td>10</td>
</tr>
<tr>
<td>Acquired brain injury</td>
<td>7</td>
</tr>
<tr>
<td>Hearing</td>
<td>7</td>
</tr>
<tr>
<td>Vision</td>
<td>5</td>
</tr>
<tr>
<td>Autism</td>
<td>3</td>
</tr>
<tr>
<td>Speech/language</td>
<td>2</td>
</tr>
</tbody>
</table>

Note. This total n in this table is more than the number of participants (n = 148) because participants were allowed to report more than one disability conditions.
Table 4.3

Multiple Regression Results for Occupational Engagement with Outliers

<table>
<thead>
<tr>
<th>OES-S</th>
<th>B</th>
<th>95% CI for B</th>
<th>SE B</th>
<th>β</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.482**</td>
<td>.464**</td>
</tr>
<tr>
<td>Curiosity</td>
<td>.431**</td>
<td>.276 - .585</td>
<td>.078</td>
<td>.393**</td>
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<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td>-.041</td>
<td>-.158 - .076</td>
<td>.059</td>
<td>-.048</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persistence</td>
<td>.271*</td>
<td>.056 - .486</td>
<td>.109</td>
<td>.234*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimism</td>
<td>.406**</td>
<td>.264 - .547</td>
<td>.072</td>
<td>.443**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk-taking</td>
<td>-.203*</td>
<td>-.394 - -.013</td>
<td>.096</td>
<td>-.199*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Model = “Enter” method in SPSS Statistics; B = unstandardized regression coefficient; CI = confidence interval; LL = lower limit; UL = upper limit; SE B = standard error of the coefficient; β = standardized coefficient; R² = coefficient determination; ΔR² = adjusted R².

Risk-taking was no longer statistically significant after three outliers were removed.

*p < .05. **p < .001.
Chapter 5: Conclusion

The purpose of this dissertation was to expand the literature on planned happenstance skills (PHS) to include college students with disabilities. Specifically, the dissertation examined: (a) the extent to which the Planned Happenstance Career Inventory – English version (PHCI-E; Lee et al., 2017) provides a valid means to measure PHS of college students with disabilities; (b) variables besides disability status predicting PHS among college students with disabilities, as well as differences in PHS between college students with and without disabilities; and (c) the extent to which PHS predict occupational engagement among college students with disabilities. Happenstance learning theory (Krumboltz, 1996, 2009) and the trilateral model of adaptive decision making (Krieshok et al., 2009) served as the theoretical framework for the studies in this dissertation. Krumboltz and Krieshok et al. acknowledged the non-linear pattern of the career development process and emphasized the importance of engagement, flexibility, and willingness to explore despite the uncertainties created by happenstances. Unique experiences of college students with disabilities (e.g., disclosing a disability, advocating for accommodations) may influence their happenstances and their PHS development in their career development process.

The findings of this dissertation address the gap in the literature on PHS of college students with disabilities. Specifically, Chapter 2 of this dissertation examined the validity and reliability of the PHCI-E (Lee et al., 2017) and the Occupational Engagement Scale for Students (OES-S; Cox et al., 2015) when used with college students with disabilities. The results indicated that the revised version of the PHCI-E and the OES-S generally yielded acceptable internal consistency reliability, content validity, and concurrent validity when used to measure PHS and occupational engagement of college students with disabilities, respectively. Practitioners who
support college students with disabilities (e.g., career coach, academic advisor) can use these instruments to measure the level of PHS and occupational engagement. Moreover, practitioners can use the assessment results to encourage college students with disabilities to engage in activities that create positive happenstances for career development. As for research, future studies should include more diverse samples to improve the external validity of the knowledge base and incorporate qualitative data to provide richer, more nuanced descriptions of ways in which PHS might affect career development.

In Chapter 3, I identified the key covariates that strongly predicted each dimension of PHS (i.e., curiosity, flexibility, persistence, optimism, and risk-taking) among college students with disabilities. Furthermore, the evaluation of PHS level in each dimension between college students with and without disabilities indicated that college students with disabilities exhibited slightly higher levels of PHS in four dimensions (i.e., curiosity, flexibility, persistence, and risk-taking). However, after controlling the key covariates, the difference was only statistically significant in the curiosity dimension, and the magnitude of difference was small. College students with disabilities yielded a statistically significantly lower level of optimism compared to their counterparts without disabilities. The magnitude of this difference in optimism level was only large between the two groups of college students who were at year 5 or higher. However, this magnitude of difference should be interpreted with caution given the sample size of participants at year 5 or higher. Considering the magnitude of difference and the sample size, I would interpret that the differences in PHS levels across five dimensions between the two groups were not meaningful. In other words, it appears that college students with disabilities in this study had similar levels of PHS as of their counterparts without disabilities. Future research should address the limitations in the present study (e.g., sample size and representativeness) and
examine factors that may influence optimism level of college students with disabilities when approaching graduation. For example, future researchers can replicate longitudinal studies on PHS by Kim et al. (2017) and Yang et al. (2017) with college students with disabilities over time during their undergraduate program. Although there are limitations in interpreting these findings, practitioners should use this preliminary finding to adjust their level of support for college students with disabilities who are at the cusp of entering the labor force.

The study in Chapter 4 focused on the extent to which PHS predict occupational engagement among college students with disabilities. When outliers in the data were excluded, the findings indicated that curiosity, optimism, and persistence strongly predicted occupational engagement in a positive direction. This result mirrored findings from a previous study (Kim et al., 2014) that demonstrated a significant and positive correlation between PHS and occupational engagement. This result also aligned with the happenstance learning theory (Krumboltz, 2009) and the trilateral model of adaptive decision making (Krieshok et al., 2009) that emphasized the importance of engaging in activities to improve understanding about self and career interests, and to create positive happenstances. Future research should identify and investigate mechanisms that could explain the strong relationship between PHS and occupational engagement. Moreover, future studies should address the limitations by conducting purposive sampling to improve external validity, using triangulation to include self and other stakeholders in completing the assessment, and examining other variables that may influence occupational engagement among college students with disabilities. Although more research is needed to clarify the relationship between PHS and occupational engagement, practitioners should consider incorporating PHS in their practice so that college students with disabilities are more engaged in career exploring activities. For example, career coaches should encourage college students with disabilities to be
more curious (e.g., exploring extracurricular activities or volunteering opportunities) because curiosity is the strongest predictor of occupational engagement.

In summary, the findings from this dissertation contribute to the body of knowledge on PHS and college students with disabilities. The impact of happenstances in career development has been widely acknowledged in career counseling practices for over two decades (e.g., see Mitchell et al., 1999; Sharf, 2013). Rojewski (1999) suggested that youth with disabilities were at risk of not having the same quantity and quality of opportunities as their peers without disabilities, thus may be more negatively influenced by their happenstances. However, to my knowledge, there were no studies that empirically examined PHS of youth with disabilities, and this study provides preliminary findings on PHS of college students with disabilities. However, it is important to note that college students with disabilities are not representative of youth with disabilities as a whole. They are not only among the most successful youth within the disability population, their unique experiences include opportunities to regularly use self-advocacy and self-determination skills (e.g., Garrison-Wade, 2012; Getzel & Thoma, 2008; Morningstar et al., 2010). I suggested three areas of future research focusing on PHS and youth with disabilities. First, future studies should examine if youth with disabilities who are not in higher education develop the same level of PHS as their peers in college. Second, the findings of this study emphasize the strengths of college students with disabilities; therefore, it is important to explore their experience and the environmental factors they were exposed to during K-12 education. Third, future research should explore the role of PHS in employment outcomes of youth with disabilities. The objective of these future studies is to better understand the career development process of youth with disabilities and to use the knowledge that is gained to provide more meaningful supports to them. Today’s youth with disabilities are encountering an everchanging
job market, and it is more important than ever to assist them in finding career paths that match their passions and talents.
References


