WONDERING ABOUT FUTURE UNKNOWNS: AN EXPLORATION OF MAJOR-RELATED INFLUENCES IMPACTING COLLEGE STUDENT CAREER ATTITUDES

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The Supervisory Committee certifies that this ***disquisition*** complies with North Dakota State University's regulations and meets the accepted standards for the degree of

DOCTOR OF PHILOSOPHY

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ABSTRACT

The research presented in this disquisition examines how college experiences shape career attitudes. The dissertation explores major-related support systems, the influence of parental education level, and the validation of career attitudes measurement. The first article highlights the positive impact of major-related support systems on career attitudes, particularly for first-generation students. The second article validates items for the ACREO career attitudes scale, stressing the need for thorough measurement. The third article examines wonder pedagogy's transformative role, emphasizing themes of community and exploration. The findings suggest a potential shift to Kegan's self-authorship stage in doctoral participants, emphasizing vulnerability, exposure to diverse identities, and a desire for societal impact in career development. The findings emphasize the crucial role of academic and co-curricular activities, such as building community, exploration, and networking, in shaping career attitudes. It underscores the importance of addressing support systems and major choices as well as integrating various forms of capital in program development. The analysis discusses avenues of future research as well as inform evidence-based decisions for programmatic and institutional development in shaping meaningful career pathways for students.

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DEDICATION

This dissertation is dedicated to my daughter, Bellamy. Embrace your independence and individuality. Chart your own path by making your own decisions and your own mistakes. I hope that you can find your way, no matter what that looks like, in a world that feels as though it owns women's bodies, hearts, and souls. I hope that our world changes for the better by the time you are grown. Or, if not, I hope the world burns at your feet after you light the match.

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CHAPTER ONE: INTRODUCTION

Current trends in the 21st century focus on connecting an individual's personality traits with future career paths to improve outcomes such as happiness and a sense of belonging in the workplace (Betz, 2007). In practice, this approach places students into an active role in making choices that influence their future careers (Lent et al., 2002). Active roles can also build self-agency and self-efficacy for undergraduate and graduate students. By understanding there is more than one pathway to personal, academic, and career success, graduate students open the door to taking on multiple identities despite education or personal barriers. For example, depending on their goals, students may choose to undertake research, network with other professionals, or start a family, all during their degree program (O'Meara, 2013). By participating in these activities, students understand how they view their knowledge and skills concerning their identity and careers.

The notion of career attitudes, which can contribute to career readiness, can vary among college students due to diverse factors, resulting in a need for more consensus among scholars regarding a unified definition of career attitudes within the context of college student workforce preparation. For this dissertation, career attitudes for college students are defined as "college-related career outcome expectations…defined as beliefs and understandings concerning the extent to which college is effectively preparing students for their future career trajectories" (Dahl et al., 2021, p. 124). Students need to be willing to question, wonder, and experience the world around them, as they did when they were children, to develop career attitudes.

Many children spend the formative years of their lives exploring, learning, and wondering about the world around them. Children can learn why something is happening through wondering and pursuing an answer through different means, such as play and

questioning (McEwan, 2008). College students can experience wonder in many of the same ways. Wonder, a concept so significant to development throughout childhood, can be purposefully embedded into the classroom and co-curricular activities to evoke emotion and encourage learning (McEwan, 2008). While several definitions of wonder exist for this dissertation, wonder is defined as an act that provides a space for individuals to question, learn, and explore in ways that they can become a part of the world around them (Byers, 2022).

Wonder pedagogy has an even wider influence once students leave the classroom. Niedermeyer (2018) found that pre-service teachers felt more connected to curiosity and discovery by promoting wonder in the classroom, which further positively influenced their classroom teaching. However, learning about how an individual's preferences and passions influence career possibilities has become more embedded into the college experience. The activity of wondering is part of the foundation of building self-efficacy, leading to improved career attitudes. The three articles presented in this dissertation examine the impact of college student participation in curricular and co-curricular activities on developing thinkable selves and relevant beliefs regarding their connection to careers.

Background

Over the past 150 years, to respond to changing societal needs, institutions have adjusted how they provide skill-building and career-readiness activities to students. Before the 20th century, much of the focus in higher education was on building skills and vocational guidance such as critical thinking, literacy, and societal networks rather than finding an occupation following schooling (see Dey & Cruzvergara, 2014; Dey & Cruzvergara, 2019). According to Grubb and Lazerson (2005, p. 4), no law, medicine, or engineering profession in the United States legally required a college degree before 1900. The exception was the creation of land-

grant universities through the Morrill Land-Grant Act of 1862, which provided an alternative schooling option that focused on vocational careers for the masses rather than a select few. For students during this time, college was less about wonder and more about encouraging conformity (Thelin, 2011).

A shift occurred following the chaos of both world wars, pushing the focus of careers in higher education to place individuals into jobs that benefited society and supported research, such as agriculture and engineering (Marcus, 2015). As society moved toward the 21st century, policies continued to be passed at the federal level requiring career curriculum implementation or activities into the K-12 system in response to increasing workforce needs (Dougherty & Lombardi, 2016). During this time, the terminology career or technical education was born, continuing an ongoing debate regarding the true purpose of education. Today, college students participate in curricular and co-curricular activities to help build self-efficacy and agency, such as student organizations and internships. However, the question is still being asked today as to whether higher education exists for the individual's growth and personal benefit or if its purpose is to educate and expect the individual to use such knowledge to benefit society.

Utilizing wonder in college can assist students in recognizing their ignorance, encourage them to seek out new knowledge, and continue seeking new information while using it to help others (Niedermeyer, 2018). This research views wonder as an active, ingrained process that individuals participate in every day, consciously or subconsciously. The process of wondering promotes creativity and a willingness to seek new information or experiences, contributing to positive self-efficacy. Previous studies have found that self-efficacy is connected to an individual’s career identity, influencing career exploration and confidence in choosing a career (see Fouad et al., 2006; Solberg, 1998). On today’s college campuses, undergraduate and

graduate students can build a career identity through various means, both curricular and co-curricular. Creating foundational relationships between institutions and employers has embedded experiential learning into curriculums to improve the student-to-employee career pipeline. For example, one study of college graduates found that 53% of participants noted that their current job was directly connected to their college internship experience (Galbraith & Mondal, 2020). While current trends demonstrate this positive trend, more can be done to help college students understand how their identity development influences their career attitudes well into adulthood.

Statement of the Problem

Previous research in student identity development has focused on undergraduate and graduate students as separate populations. The assumption is that since these students are at different points in their education, they go through unrelated processes leading to persistence in their education programs and eventually move into the workforce. This dissertation strives to connect these populations' experiences by understanding the impact participation in and out of the classroom has on identity development and self-efficacy, including their career attitudes.

Statement of Purpose

This study investigates the influence of factors such as pre-collegiate factors, major-related support systems, collaboration, and community-building on student identity development and sense of belonging for undergraduate and doctoral-level students. The goal of this dissertation, taken as a whole, is to help connect participation in curricular and co-curricular activities with individual evolution into successful, self-reflective, and happy adults by growing their understanding of their likes, dislikes, and drivers.

Conceptual Framework

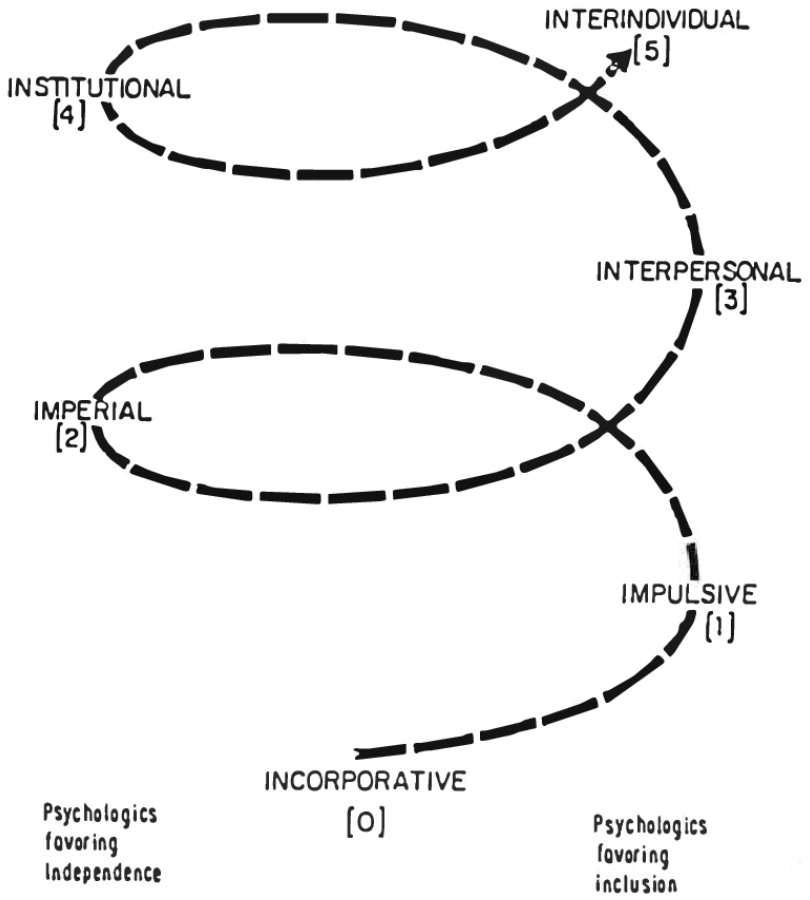
A conceptual framework provides a focus and guide utilized during the research process. This framework helps define and connect the main themes while demonstrating their impact on one another, a process, or a practice (Farley-Ripple et al., 2018). A conceptual framework also provides a pathway or process that helps guide the research process and build an argument for relevance to whom the research impacts (Ravitch & Riggan, 2012). Kegan's (1980) Constructivist Developmental framework, built from the work of Jean Piaget, highlights the significance of meaning-making, the constant evolution of the self, and relationships in human development throughout life. Kegan's (1982) framework focuses on five stages of human development that all individuals evolve through during their lifetime: (a) incorporative, (b) impulsive, (c) imperial, (d) interpersonal, and (e) institutional (Figure 1.1).

Kegan (1982) describes each evolutionary developmental stage as "temporary solutions to the lifelong tension between yearnings for inclusion and distinctness" (p. 108). His 1980 framework was the first of three iterations between 1980 and 2000, which evolved in focus and title, moving from *stages of development* to *orders of consciousness* and, finally, to *forms of the mind* (Reis, 2019). Later iterations shifted to the latter three stages, as the socialized mind, self-authorship, and self-transformation are the most evolved stages. This dissertation focuses on college students, who mostly fall into interpersonal/socialized and institutional stages due to the variability in undergraduate and graduate students' ages. College and other life experiences serve as one *holding environment* before the shift to another stage of development, and not all students progress through the stages at the same rate or in order. Kegan describes such environments as "a life history of cultures of embeddedness…psychosocial environments which hold us (with which

we are fused) and which let us go (from which we differentiate)" (1982, p.116). College is one such holding environment that undergraduate and graduate students evolve through.

Figure 1.1.

Kegan's Constructivist Developmental Framework: A Helix of Evolutionary Truces



Note. Kegan, R. (1982). The Evolution of Self. Harvard University Press.

A student's evolution between stages depends on the evolution from one to another. For undergraduate students, the initial shift into the interpersonal environment can be initiated by the move into college, a time of great excitement. It is a time of building self-agency and becoming one with a culture of embeddedness built into their new surroundings. Participation in and learning from relationships is a primary tenant of the interpersonal self. However, the move to

college is a dichotomy in which students test their independence while experiencing the vulnerability and emotions of being separated from their embedded relationships throughout the imperial stage (Kegan, 1982). Kegan's theory also recognizes that patterns recur throughout the lifespan.

Depending on their age and experiences, graduate students may be moving into the institutional self, focusing on individualization rather than inclusion within their culture of embeddedness. Self-authorship, ambition, and achievement are embedded functions throughout the institutional self (Kegan, 1982). According to Kegan, the institutional self is in a relationship with itself, focusing on autonomy and identity formation. While there is growth in self-awareness and self-regulation, this self can also experience vulnerability when losing the support systems previously established during the interpersonal stage (Kegan, 1982). Shifting into the self-authoring mind, individuals begin to write their own identity, becoming a "personal authority" (RSA Social Brain Centre, 2013). A facet of this stage is that individuals need to be willing to take the risks associated with sharing internal desires and assuming responsibility for the results of those actions (The Keynes Centre UCC, 2015). Kegan hypothesized that the increasing lifespan of humans necessitated the possibility of shifting into self-transformation, the stage in which we focus on moving the human species forward through less destructive means (RSA Social Brain Centre, 2013). It is important to note that it has been suggested that approximately 35% of the adult population progress into the self-authoring mind stage, while less than 1% of the population progress into the self-transformation stage (Thinking Collaborative, 2018).

Kegan recognized the importance of variability between stages, utilizing broad age ranges for each step rather than set age ranges. According to Kegan, a foundational assumption

of constructivism is meaning-making, explaining in an interview with David Fuller (Rebel Wisdom, 2019) “that reality doesn’t just sort of happen up to us pre-formed. One of the actions we do as human beings is that we give shape to raw experiences and make it into something meaningful for us”. Later in that same interview, Kegan explained:

> Living organisms and systems including human beings don’t just grow in the sense of getting bigger and bigger, we evolve, we become more complex. Growing in our meaning-making or even in our wisdom is not about just knowing more and more through a given logic but actually having the underlying logic itself. (Rebel Wisdom, 2019)

Besides the constructivist developmental framework, this research pulls ideas from the concept of ‘unthinkable’ selves (Carlone et al., 2015). The concept of unthinkable selves focuses on the role of the individual doing the thing, whatever it may be, and building experiences that create connections to previously unthinkable identities. Carlone’s research argues that “learning is identity work” by making students and their experiences a central part of the learning process (Carlone et al., 2015, p. 1526). According to Carlone et al., identities, particularly in adolescence, are influenced by external factors, like family values, societal expectations, and socio-economic status (2015). In this vein, identity work allows individuals to explore new options, ask questions about the world, and make connections previously unknown to them, all in a supportive community environment. This concept echoes the role of the individual in Kegan’s framework (1982):

> I suggest that human development involves a succession of renegotiated balances, or ‘biologics,’ which come to organize the experience of the individual in qualitatively

different ways. In this sense, evolutionary activity is intrinsically cognitive, but it is no less effective; we are this activity, and we experience it. (p. 81)

This conceptual framework also serves as the grounding framework in which the following three articles use the theoretical frameworks of Social Cognitive Career Theory, Constructivist Grounded Theory, and Alexander Astin's I-E-O Model.

Positionality

My journey as a first-generation college student left me uninformed about the importance of activities such as connections and experience on my eventual career success. Without the guidance of anyone with college experience, I did not know how to seek resources and experiences. My career struggles led me to pursue a doctoral degree while maintaining full-time employment in my thirties. This challenging endeavor and my career and volunteering experience with youth and college students ultimately made me realize the connection between undergraduate and doctoral journeys.

This experience, in addition to my past work in higher education, focusing on career exploration and readiness, has convinced me that career development plays a pivotal role in shaping a student's identity during their college years. I have seen the positive and negative impacts that support systems, or lack thereof, can have on the trajectory of a student's life, regardless of age. My experiences as an instructor in the college classroom have also supported my viewpoints on the importance of support in college success. I witnessed the ups and downs of navigating college, whether those students are new freshmen directly out of high school trying to explore majors or doctoral students diving in-depth into how connection positively impacts their success in the program. Each of those groups faces challenges and barriers; however, the one thing they have in common is the desire to move forward. Each group is undertaking higher

education to do better for themselves. As I moved through my different levels of education, from an associate degree to a doctoral degree, I now see how the desire to move forward drew me to new experiences, going from being in student organizations to advising them, from reading about research to participating in research as an Assessment of Collegiate Residential Environments survey team member. That initiative is a feeling and a desire I have seen in myself, helping drive my research interests.

These beliefs influenced the direction of my research and how such research was undertaken. The first two articles utilize quantitative data analysis to better understand the experiences of undergraduate students through self-reported data. Analyzing data from the ACREO survey allowed me to see patterns in the data collected from different student populations across the United States. Quantitative data allowed me to understand better connections and the influence of various factors on career attitudes. I can also present it in a way that demonstrates understanding and the need for further research to build better programming to help students succeed through numbers.

However, I also firmly believe that we cannot implement changes without first having those important conversations with the students. Qualitative data provides the insight, the feelings, and the story from which real change can begin. First-hand student accounts can demonstrate the imprints that experiences leave on memory and influence actions even today. By having a well-rounded understanding of students' experiences through quantitative and qualitative research, the intent is that change that demonstrates both needs and wants supported by data can be implemented.

Organization of the Disquisition

This dissertation consists of three journal articles that aim to emphasize the importance of understanding the real-life experiences of college students and how those experiences shape their identity development. The goal is to provide insights for scholars and practitioners in this field. Chapter two examines the relationship between major support systems and career attitudes when considering generational, first-generation, and continuing-generation student status. A version of chapter two was presented at the 2022 ASHE Conference. Chapter three examines the validity of 18 new survey items that hope to address college student career attitudes. Chapter four examines the influence of introducing wonder pedagogy and community into the classroom on career attitudes in doctoral students.

Chapter 2: Career Attitudes: Humanizing Student Confidence Through Major-Support Systems

College students are expected to maneuver a complex system of resources to gain the skills necessary to succeed in their chosen fields; however, not all populations are equally prepared. The purpose of this study will be to investigate the impact of major-related support systems on the career attitudes of college students, with a specific emphasis on first-generation college students (FGCS). Using the Social Cognitive Career Theory framework, the research is grounded in a theoretical framework focusing on the significance of social capital and resources in navigating the college experience. It emphasizes the significance of connection-making for students regarding various campus and life resources. The challenges faced by FGCS in accessing support systems and underscores the significance of effective campus support in bridging the gap will also be discussed.

Hierarchical linear regression modeling will focus on the relationship between major support systems, career attitudes, and generational student status, first-generation and continuing generation, using data from the Spring 2019, 2020, and 2023 administrations of the Assessment of Collegiate Residential Environments and Outcomes (ACREO) survey. The paper concludes by highlighting the implications and potential impact of the findings for scholars and practitioners in supporting students' persistence and career success in college. The findings will provide a starting point for conversations on college campuses regarding programming and resources for first-generation college students.

Chapter 3: Measuring Career Attitudes

Several shifts have occurred in higher education over the past 150 years. Over the late 1800s and the entirety of the 1900s, institutions in the United States grew in size and welcomed a greater diversity of individuals on their campuses (Goldin & Katz, 1999). The role of institutions in vocational or career training also shifted from placement to a more connection-based career readiness model (Dey & Cruzvergara, 2014). In recent years, the public has begun to question the cost of college education, pushing institutions to focus efforts on graduating career-ready students. Research demonstrates that immersive connection-making activities, such as internships, mentoring, and student organizations, help students understand their skills and how they can apply them in their work. However, there needs to be more scholarship relating to the concept of building career attitudes despite a growing focus on the role of career preparation on college campuses. Students need to play an active role in seeking out experiences, both major-related and not, to create a foundation that will serve them well in jobs following graduation. Currently, no valid survey instruments specifically measure career attitudes in college students.

This paper focuses on creating and validating survey items that accurately measure the construct of latent career attitudes using Social Cognitive Career Theory as a conceptual foundation. Eighteen new items were piloted using the Spring 2023 administration of the Assessment of Collegiate Residential Environments and Outcomes (ACREO) survey, sent to undergraduate students at a Far West university. Exploratory factor analysis and Rasch modeling were conducted to determine the psychometric properties of potential new items. It is hypothesized that the new items will help to capture data that accurately reflects how students view their attitudes toward career exploration and experiences.

Chapter 4: Welcome to a New Planet Called Doctoral Research: The Impact of Wonder and Reflection on Career Attitudes

Doctoral students often face significant achievements and challenges during their studies, and attrition rates among doctoral students have been a growing concern. More research is needed to understand the influence of pedagogical practices, such as prioritizing connection-making in and out of the classroom, on the career attitudes of doctoral students. While some doctoral students begin their programs with a firm sense of their ambitions, others might not. Doctoral journeys are influenced by students' backgrounds, values, career aspirations, and institutional and life barriers (Craddock et al., 2011). Perception of competency plays a crucial role in student persistence, with factors like faculty relationships and community affecting their belief in their ability to graduate, especially for online doctoral students (Garcia & Yao, 2019). It is hypothesized that integrating social belonging and community-building activities into doctoral programs can help students feel connected and supported, reducing the impact of imposter syndrome and leading to improved career attitudes.

This paper will explore the relationship between wonder pedagogy in doctoral students, career attitudes, and identity using qualitative analysis of reflection papers and semi-structured interviews. Wonder pedagogy, which promotes curiosity, exploration, and learning without fear of judgment, has positively affected students' well-being and quality of work (Sverdlik et al., 2020). Using Charmaz's Grounded Theory (2006) as its foundation, the analysis of the reflection papers demonstrates that several key concepts were essential to integrate into the participant interviews completed in Fall 2023. Additionally, the reflection paper analysis demonstrates the importance of community within the doctoral classroom. Participants reported that it encouraged critical thinking, creativity, and questioning, fostering a deeper connection with the subject matter and promoting community-building in classrooms. The interviews reflected an interesting conflict between the beginner doctoral student and growth towards the desire to question everything both in and out of the classroom. These same students often recognized the disconnection between themselves and their chosen careers, leading to new opportunities outside the classroom. Some participants demonstrated a willingness to take risks in moving into new careers and recognized the responsibility they have to make such decisions, signifying a potential shift into the self-authorship stage of Kegan's development.

Chapter 5: Conclusion

Lastly, chapter five focuses on how the three previous studies are connected and discusses possible practical implications and avenues for future research. The discussion focuses on how the findings of this dissertation can be utilized to improve the college experience and career preparation for students, no matter their education path. The insights can inform institutions and professionals about the importance of fostering connections, building community, and promoting a positive career mindset, leading to increased persistence and

success in higher education and beyond. These findings can drive discussions and initiatives to enhance resources and support systems, especially for underrepresented students on their educational and career paths.

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CHAPTER 2: CAREER ATTITUDES: HUMANIZING STUDENT CONFIDENCE THROUGH MAJOR-SUPPORT SYSTEMS

Students arrive on college campuses with various forms of support and knowledge that help to contribute to their growth and success in curricular and co-curricular pursuits. The recognition and use of various forms of capital, such as social and cultural, as well as resources to help students connect with campus and life resources, play a significant role in navigating social structures like college. Capital is "what makes the games of society–not least, the economic game–something other than simple games of chance offering at every moment the possibility of a miracle" (Bourdieu, 2018, p.78). However, some students are unfamiliar with the collegiate ties and resources associated with moving forward in the world, including building relationships and networks (Pascarella et al., 2004). These relationships with professors, peers, and success resources positively impact students' confidence in their futures. The hope from families is that all students will graduate career-ready, having built skills and relationships through coursework. Stakeholders also expect that the resources available at college will prepare graduates to enter the job market.

Consistent pressure from parents, friends, work, and a global pandemic has made finding and maintaining support systems even more imperative to collegiate outcomes. According to Sung et al. (2013), these outcomes can include increased persistence, positive mental health, and increased satisfaction in later careers. For this study, major-related support systems are defined as "the extent to which they have access to peer role models and professional mentors who are supporting them in their major as well as the extent to which they feel supported in their major by family" (Dahl et al., 2022, p. 10). These support systems can influence career attitudes. For the purposes of this research, career attitudes are defined as the perception of how a declared

major will impact the ability to find major-related jobs that fulfill personal and professional goals following graduation (Dahl et al., 2022). Due to the connection between career outcomes and major-related support systems, it is hypothesized that major-related support systems and generational student status, first-generation and continuing generation, are related to perceived student career attitudes.

Building Career Attitudes through Support Systems & Networks

This paper emphasizes a holistic approach that investigates how students derive meaning from their college experience that translates into career attitudes. It delves into the influence of external support factors, including classroom knowledge, familial support, and peers, on developing identity and career attitudes during college (Magolda, 2009). By the time students graduate, it is the intent that they will be ready for the workforce by integrating experiences such as mentoring, networking, and internships throughout their education.

Each student, regardless of undergraduate or graduate, is impacted by various pre-college factors, such as socioeconomic, generational student status, and cultural background, influencing their interactions with college classrooms, campus resources, and networks. Those students who can find connections and relationships on campus are more likely to persist to graduation. Azmita, Sumabat-Estrada, and Covarrubias (2018) found that campus programs, such as peer groups, ethnic student organizations, sports teams, and volunteering groups, were significant sources of building a sense of belonging on campus. Mentoring, another facet of major-related support, provides a supportive environment for growth. Scholars have found that mentoring and the closely related technique of coaching can help students build skills in collaboration and network building to be successful in professional environments, as well as help to increase

persistence and retention rates (Gamage et al., 2021). These relationships are impactful and build networks, creating a foundation for one's major and a starting point for exploring future careers.

Depending on one's selected major, the systems needed to help improve career attitudes can shift based on pre-college characteristics and demographics. One such pre-college characteristic is socioeconomic background. Research has found that low socioeconomic background is a significant factor in college and work outcomes (Xing et al., 2019). Research has also found a link between academic planning, economic hardship, and career development. The inability to dedicate time to academic planning negatively influences self-efficacy and career development as students are less likely to see themselves in particular careers (see Brady-Amon and Fuertes, 2011; Kim, 2014). Economic hardship can increase family-related stressors and reduce the time associated with academic planning. Parent income and schooling background are "significant predictors of earnings and occupational status even after educational history, formal degrees, and cognitive skills variables are controlled" (Caro et al., 2015).

Generational student status, such as being a first-generation or continuing-generation student, has also impacted the student college experience. Pascarella et al. (2004) found that first-generation college students (FGCS) were less likely to participate in student activities, like student organizations, were less likely to live on campus and take fewer credits than their peers throughout their degree program. Students utilize major support systems and interactions in the classroom, such as student organizations, mentors, and faculty relationships, to build social capital. Each of these activities and connections mentioned above works to increase students' social capital, which contributes to their overall cultural wealth. Students can access networks and resources they may not have interacted with by increasing their social capital. This social capital helps students connect with networks that are beneficial when looking for volunteering,

internships, and full-time careers (Parks-Yancy, 2012). For FGCSs, institutions can help to bridge knowledge of resources, professional networks, financial management, and perceptions of career attitudes (see Levine & Aley, 2021). Previous research has demonstrated that first-generation students also have lower levels of academic engagement, both in the classroom and out of it, than their continuing-generation peers (Soria & Stebleton, 2012). Programs oriented at helping students navigate resources and integrate career exploration, such as TRiO services and career courses, can positively impact student persistence, major satisfaction, and career satisfaction (Kezar et al., 2020).

Using data from the 2019, 2021, 2022, and 2023 administrations of the Assessment of Collegiate Residential Environments and Outcomes (ACREO) survey, I will examine the relationship between major support systems and career attitudes when considering students' parental education level. The questions guiding this study are:

1. What differences, if any, exist between declaring specific majors and student parental education level?
2. What is the relationship between students' major-related support systems and career attitudes?
3. What conditional effects exist, if any, in the perception of career attitudes depending on student parental education level?

These questions can assist scholars and practitioners in better understanding how major choice and major-support systems influence college students' persistence, considering student generational status. In this paper, I start with a discussion of social and cultural capital in relation to Social Cognitive Career Theory and existing literature relating to first-generation college students (FGCS). Lastly, I will discuss methods, results, and the implications of the findings.

Networking Inequality in College Student Populations

Not all students can utilize their knowledge and background equally on college campuses. Many students use pre-existing college factors, such as family support, to help them navigate the complex environment. First-generation students are the focus of this paper due to the several factors relating to social and community cultural wealth. First-generation students are less likely to graduate with a 2- or 4-year college degree than their continuing-generation peers, with only 20% of first-generation students obtaining a college degree after six years compared to 49% of continuing-generation students (RTI International, 2019c). Research shows that first-generation students work more hours per week than continuing-generation students (RTI International, 2019b). According to the National Center for Education Statistics, continuing-generation students had a family wealth of $90,000, more than double that of first-generation students at $41,000 (RTI International, 2019a). This concern regarding the lack of financial stability following graduation and direct major to career pathways is not unfounded, as the total student loan debt balance in the U.S. reached over $1.7 trillion (see Cahalan et al., 2021).

The concern of taking on college debt can lead to added financial stressors and the ability to participate in resources on campus such as mentoring, student organizations, and faculty-led experiences. In addition, Williams and Roberts (2022) found that students identified seeking out peers within their major, including friends and mentors, as a primary source of support when experiencing stress. However, not all students can participate in such activities equally, which fall under the umbrella of community cultural wealth. Nevertheless, first-generation college students bring other skills and support into the college environment to help them succeed.

Different student populations, such as first-generation college students (FGCS), may come to college with various skills and knowledge to help students navigate traditional collegiate

environments. Additionally, these students may need help finding the resources available to feel career-ready when close to graduation (Levine & Aley, 2021; Tate et al., 2015). In 2016, 56% of college students were first-generation, demonstrating that many students may need such assistance (Cahalan et al., 2021). The Center for First-Generation Student Success (RTI International, 2019c) found that only 44% of first-generation college graduates had careers requiring a bachelor's degree compared to 52% of continuing-generation college students following graduation. First-generation students can utilize skills based on their background and culture while facing barriers to retention and persistence. All students, regardless of major and experience, should have the opportunity to connect with their peers and access support resources. Examining how students are tapping into their major-support systems and how their major influences career attitudes is one avenue to better understanding how students are making their way, whether successfully or not, through our institutions.

Recently, there has been a call for a shift in how scholars examine the skills, supports, and values that FGCS brings into the college environment. This assets-based approach focuses on programming that uses existing supports, skills, and talents to build programming that helps to strengthen skills and abilities to improve well-being (The Center, 2017). For example, researchers have found that those students with family support have higher persistence rates (see Foud et al., 2010; Metheny & McWhirter, 2012). FGCS are also more likely to recognize the significance of family influence on major and career paths and build professional networks (Tate et al., 2015). Previous studies have also found that FGCS who connect their career future with assisting their families or a more important life goal were more likely to persist in their program to graduation (Azmita et al., 2018). Despite these supports, a study by Ion (2022) found that

FGCS continue to need help connecting their major with future career plans and participating in experiential learning opportunities, demonstrating a need for more effective campus support.

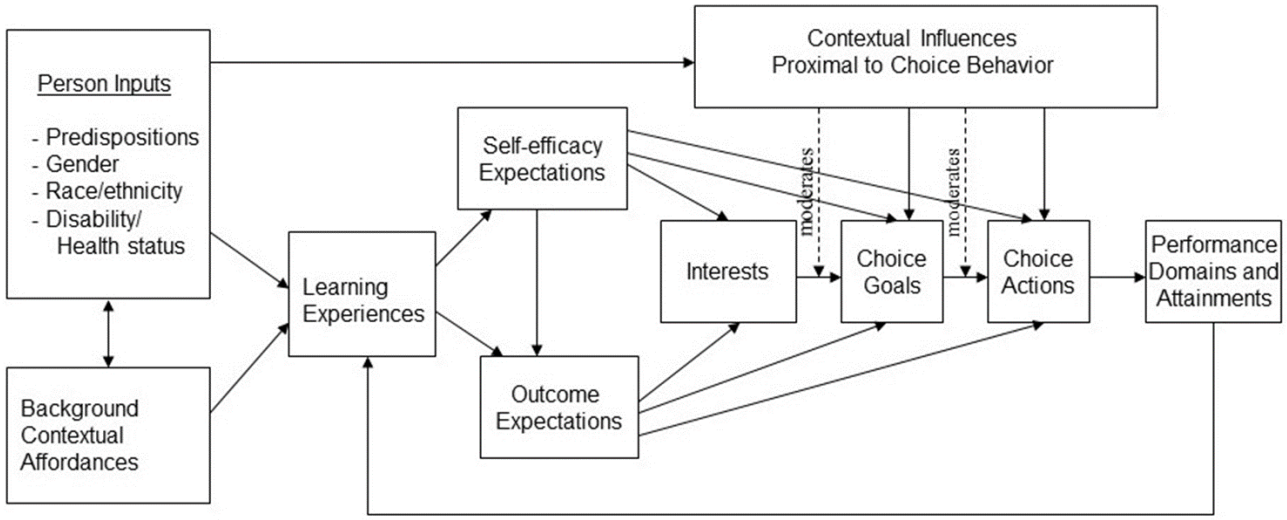
Social Cognitive Career Theory

Grounded in Social Cognitive Career Theory (SCCT), this study examines how the perception of collegiate major support systems impacts career attitudes by considering pre-educational factors such as educational generation status. As seen in Figure 2.1, SCCT (see Lent et al., 1994; Lent & Brown, 2006, 2008, 2013) includes five interrelated models–career interests, choice options, performance and persistence, satisfaction, and career self-management–to examine outcomes for individuals aged middle school and older. SCCT theorizes that inputs directly impact students' learning experiences, including modeling, which allows students to build self-efficacy (Wright et al., 2013). When self-efficacy is considered alongside choice, "people tend to develop interests in, and wish to pursue, activities through which they might obtain desirable outcomes for themselves and others" (Lent & Brown, 2019, p.8). These activities can also positively impact resilience for students whom institutions may otherwise struggle to retain due in part to the proactiveness of the student.

The SCCT framework prioritizes the inclusion of traditionally under-studied populations in careers: women, LGBT, and first-generation college students, to name a few (Lent & Brown, 2017). Previous research examining first-generation college students utilizing SCCT has found that they often acknowledge significant barriers to their success in college, such as working, familial responsibilities, and lack of knowledge regarding success resources (see Pascarella et al., 2004). Recognition and understanding of such barriers can lead to creating and implementing positive, high-impact practices for students.

Figure 2.1.

Social Cognitive Career Theory Framework



Note. Lent & Brown, S. D. (2019). Social Cognitive Career Theory at 25: Empirical Status of the Interest, Choice, and Performance Models. *Journal of Vocational Behavior*, 115, 103316-. https://doi.org/10.1016/j.jvb.2019.06.004

Capital, as a concept, influences individual decisions and impacts how one interacts with one's environment. According to Bourdieu's Capital Theory (2018), there are three forms of capital for individuals and social groups (a) economic; (b) social; and (c) cultural. Economic capital refers to capital gathered through purchasing goods and services that improve opportunities, while social capital is gained through activities such as networking, group belonging, and consistent dedication to participating in the institution of one's interests (Bordieu, 2018). Three states of cultural capital exist: (a) embodied state; (b) objectified state; and (c) institutionalized state. The ability and access to participate in activities relating to these types of capital translate to greater opportunities, power, prestige, and wealth recognized by others, known as symbolic capital (Bourdieu & Wacquant, 2013). Additionally, economic capital can be converted into social or cultural capital through time and attention (Bourdieu, 2018). Those who

have benefited from various forms of capital in the past continue to build various forms of wealth (essentially with a head start), while those who have not must build it to move ahead in life.

Yosso's Cultural Wealth Model (2005) explores the role of different types of capital and their uses with a focus on using existing capital to influence the experiences of marginalized groups positively. Community cultural wealth contributes to the diversity of student experiences on campus and includes various forms of capital: cultural, aspirational, linguistic, resistant, navigational, social, and familial (Yosso, 2005). Historically, higher education has traditionally ignored forms of wealth outside of cultural, social, and human when interacting with students, including first-generation students. However, shifting focus to the diverse cultural wealth of various student groups can enrich and empower multiple student populations (Yosso, 2005). One such way is to focus such interactions on high-impact practices. One example is peer coaching, an approach in which first-year students are matched with an established peer on campus to help navigate the college experience. Symonds (2020) examined such peer relationships and found that each type of community cultural wealth was present within those interactions. Even more significantly, those relationships were a determinant of an increased sense of belonging for first-generation students paired with a peer coach (Symonds, 2020).

Research on capital and marginalized college student populations is growing. However, there is still limited research examining the role of capital in the persistence of students living with disabilities. Much of the current literature examines the role of capital on the college-going experiences of historically marginalized students based on race. According to Rios-Ellis et al. (2015), social, familial, and linguistic capital is closely linked to fundamental values in Latino cultures, such as family networks and proficiency in multiple languages. Those forms of capital can be significant sources of wealth for Latinx students. One influential factor for Latino

students is their family's verbal and emotional support, known as familial capital, regardless of whether their parents attended college (see Arellano & Padilla, 1996). Familial capital has also been a significant indicator of persistence for women of color, especially in the STEM fields (Ceglie & Settlage, 2016).

Networks and support systems help students amass the social capital essential to building confidence in future career options, including graduate school. These systems of social capital are "the product of investment strategies, individual or collective, consciously or unconsciously aimed at establishing or reproducing social relationships that are directly usable…" (Bourdieu, 2018, p. 85). Exposing students to major-specific courses integrating exploration and career options is one way institutions can positively influence career readiness (see Mallinson & Burns, 2018; Lumpkin et al., 2017). Other interventions have also been successful. One example is smaller workshops for first-generation students focusing on professionalism, such as resume building and career development related to future career options (Means et al., 2017). These institutionally driven activities allow students to connect with other students, creating networks and normalizing career exploration for all students regardless of background.

While additional challenges exist in integrating a foundation such as SCCT in creating high-impact practices targeted at students, research demonstrates that these programs can also benefit career readiness for marginalized student populations. For minority students, integrating co-curricular activities, such as research into major activities, has also been shown to increase social capital and improve persistence into science-based careers (Ovink & Veazey, 2010). Rios-Ellis et al. (2015) found that first-generation Latino students positively benefited from participating in a peer mentoring program that maximized existing capital while integrating education on career-related topics.

Building programs with such frameworks as a foundation requires further training for many staff and faculty, which may need more funds or time. The ability to connect with students can positively influence the persistence of women of color into pursuing STEM careers (Ceglie & Settlage, 2016). SCCT provides a foundation for grounding the research questions, especially concerning understanding the differences between students' career attitudes based on inputs such as major choice and generational student status. These contextual variables help students to build the knowledge and skills to achieve career outcomes, the primary focus of this study.

Positionality

Acevedo et al. (2015) defined positionality as "The positions from where we make meaning of—as well as engage with—the world is informed by our identities and lived experiences" (p. 31). I identify as a white, cisgender, and non-religious individual. As a first-generation college student, I have lived through the difficulties of navigating college without the knowledge of how college works and the resources available to me. Through working in a career and advising office for the past five years, I have questions about how majors and generation student status impact career readiness, if at all. I recognize that my experiences on various college campuses during my education influence how I approach this research. My involvement in volunteering with young women as they work through the juvenile justice systems opened my eyes to the deeply ingrained inequities that face youth. Additionally, my volunteering as an advisor for university student organizations has deepened my investment in understanding how students navigate college while trying to balance societal expectations.

Methods

Data and Sample

The study uses data drawn from the 2019, 2021, 2022, and 2023 administrations of ACREO (there was no data collection in 2020 due to the COVID-19 pandemic). The project assesses how various collegiate environments influence student academic, social, and intellectual development. The survey was sent to over 36,600 students at five institutions in the spring of 2019, an additional 7,712 students at three institutions in the spring of 2021, and 4985 students at one institution in the spring of 2023. These institutions are located in the Great Lakes, Southeast, and Far West regions. These geographic regions used for describing geographic regions in the United States and are the same regions established by Bureau of Economic Analysis (2024). Data cleaning a listwise deletion removed respondents who responded to less than 80% of the survey. Those students who reported no declared major were also removed from this study, resulting in a final sample of 7,170 student respondents (response rate of 14.6%). See Table 2.1 for demographic information.

Measures

The ACREO survey continues the groundbreaking work of the National Study of Living-Learning Programs (see Inkelas and Associates, 2008). All factor scales were psychometrically examined after each administration using confirmatory factor analysis and Rasch modeling. Rasch modeling was used to create the factor scores for this study, ensuring that scores are continuous and linear (see Harwell & Gatti, 2001).

The dependent variable is a five-item index to measure students' career attitudes. This study defines career attitudes as "beliefs and understandings concerning the extent to which college is effectively preparing students for their future career trajectories" (Dahl et al., 2021, p.

124). Respondents rated their level of confidence (*1= not confident at all to 5=confident*) in their ability to receive a good job (or graduate school) offer after graduation, find a job with a desirable salary, find a job that they would find satisfying, find a job that can "make a difference" in people's lives, and apply skills developed in their major to their job (alpha = .890).

Table 2.1.

Student Demographic Information (N=7,170)

	N	%
University		
Southern University	759	11%
Great Lakes University	103	1%
Far West University	3,223	45%
Upper Far West University	309	4%
Midwestern University	818	11%
Upper South University	593	8%
South Midwestern University	187	3%
Lower Great Lakes University	321	4%
Far Southeast University	857	12%
Administration Year		
2019	5,496	77%
2021	625	9%
2022	857	12%
2023	192	3%
Gender Identity		
Cisgender Man	2,199	31%
Cisgender Woman	4,720	66%
Genderqueer, non-binary, or another	212	3%
Transgender man or woman	39	5%
Sexual Identity		
Bisexual students	692	10%
Gay students	170	2%
Heterosexual students	5,655	79%
Lesbian students	92	1%
Queer students	561	8%
Race and Ethnicity		
Students with another race or ethnicity (including Native American or Alaskan Native)	211	3%

Table 2.1.

Student Demographic Information (N=7,170) (Continued)

	N	%
Asian or Asian American students	1,569	22%
Black or African American students	324	5%
Hispanic or Latina/o/x students	590	8%
Students with more than one race or ethnicity	53	9%
White students	3,818	53%
Worldview		
Agnostic students	1,259	18%
Students with another worldview	519	7%
Atheist students	915	13%
Buddhist students	182	3%
Christian students	3,423	48%
Hindu students	113	2%
Muslim students	97	1%
Jewish students	210	3%
Students with more than one worldview	297	6%
Non-religious students	43	6%
Spiritual students	12	2%
Academic Class Year		
First-year students	3,188	44%
Second-year students	1,993	28%
Third-year students	1,475	21%
Fourth-year students	481	7%
Fifth-year or more undergraduate students	33	5%
Academic Major		
Arts and Humanities	817	11%
Business Administration	672	9%
Health Professions	760	11%
Science, Engineering, or Mathematics	2,968	41%
Social Sciences or Education	1,953	27%
International students	373	5%
First-generation students	1,899	26%

The key independent variable is a measure of major-related support systems. This four-item index prompts respondents to provide their level of agreement *(1 = disagree strongly to 5 = agree strongly*) with statements such as, "At the present time, I have access to a peer role model

(e.g., someone I can look up to and learn from by observing) in my academic major," and "At the present time, I feel that my family members support the decision to major in my intended field." In addition, other factors related to career outcomes will be controlled to isolate the relationship between major-related support systems and career attitudes, including academic confidence, major persistence intention, residential environment's influence on major, and sense of belonging (see Dahl et al., 2019). Finally, undeclared students were removed from the analysis. As undeclared, those students would have had little ability to build support systems within a specific major since they focus on exploring various majors to gauge interest (see UIUC Admissions, 2022).

First-generation status was determined using self-reported highest level of education completed (high school or less; some college, but no degree; associate's degree; bachelor's degree; master's degree; and doctorate or professional degree) for each of two possible parents or guardians (two separate items were presented, one for each parent or guardian). Students did have the option to select "not applicable" to both items. Respondents who selected that neither parent nor guardian had earned a bachelor's degree will be coded as first-generation (see Lundberg, 2012).

Analysis

The analysis utilized two-way frequency tables and hierarchical linear modeling with standard errors clustered by each educational institution to examine the relationship between major-related support systems and career attitudes. Hierarchical linear modeling was an appropriate statistical approach as the data violates the assumption of homoscedasticity when tested. The first block only considered pre-college demographic variables, including gender, sexuality, race/ethnicity, and worldview. Academic experiences, including student parental

education level, year in school, college major (aggregated), and GPA, were added to the model in Block 2. Blocks 3 and 4 added learning experiences, including academic confidence, intent to persist in one's major, residential environment, and campus sense of belonging. Lastly, major-related support systems were added in Block 6. Appendix A illustrates the overall model.

Any outliers, such as data with extreme values outside of the normal distribution, were left in the dataset. All continuous variables were standardized, and all discrete variables with two or more categories were effect coded. I chose to effect code these variables over using indicator variables for two primary reasons. First, effect codes calculate parameter estimates by comparing the value for one group (e.g., students majoring in arts and humanities) to the unweighted total mean instead of a single arbitrary reference group (e.g., students majoring in STEM disciplines). Each category was then coded and received an estimate with this approach, retaining information for all subgroups within a variable. Additionally, using effect codes minimizes the essentializing created by comparing populations to a dominant category (see Mayhew & Simonoff, 2015). Descriptive statistics for the continuous variables are provided in Table 2.2.

Table 2.2.

Descriptive Statistics for Standardized Continuous Variables

Variable	M	SD	Min	Max
Self-reported Cumulative GPA	0.00	1	-7.401	1.112
Academic Confidence	0.00	1	-5.010	0.737
Major Persistence	0.00	1	-5.319	0.671
Residential Environment's Influence on Major	0.00	1	-3.848	1.937
Sense of Belonging	0.00	1	-3.644	1.531
Major Support System	0.00	1	-3.346	1.629
Career Attitudes	0.00	1	-4.276	1.315

Results

Multiple standard two-way frequency tables, including testing for independence, were used to examine the relationship between student parental education level and discipline

selection. The first analysis found that the relationship between aggregated major category and student parental education level was significant, X^2 (4, N = 7,170) = 40.7186, p<.000. The findings demonstrate that fewer first-generation college students reported majoring in STEM majors than the expected value calculated for the model. First-generation college students were also more likely to report majoring in a Social Sciences-related major than any other major category. All tabulations for these variables are displayed in Table 2.3.

Table 2.3.

Two-way Tabulation of Major Aggregated & Student Generational Status

Major Category (Aggregated)	Generational Status		
	Continuing	First Gen	Total
Arts and Humanities	578	239	817
	600.6	216.4	817
	0.9	2.4	3.2
Business Administration	521	151	672
	494	178	672
	1.5	4.1	5.6
Health Professions	526	234	760
	558.7	201.3	760
	1.9	5.3	7.2
Science, Engineering,	2,273	695	2968
	2,181.90	786.10	2968
	3.8	10.6	14.4
Social Sciences or Education	1,373	580	1953
	1,435.70	517.30	1953
	2.7	7.6	10.4
Total	5,271	1,899	7170
	5,271.00	1,899.00	7170
	10.8	29.9	40.7
Person chi2(4) = 40.7186		Pr=0.000	

A second two-way frequency table was conducted using the major category and student parental education level variables to examine the differences between declaring specific majors

(see Table 2.4). The relationship between specific majors and student parental education level status was significant, X^2 (21, N = 7,170) = 148.86, p<.000. First-generation students reported enrolling in an engineering or communications and journalism major at a lower rate than continuing education students. Additionally, first-generation students reported enrolling specifically in education majors at a higher rate than the expected value calculated for the model.

Table 2.4.

Two-way Tabulation of Major Category Choice & Student Generational Status

Major Category	Generational Status		Total
	Continuing	First Gen	
Agriculture	33	21	54
	39.7	14.3	54
	1.1	3.1	4.3
Architecture and Building Trades	50	22	72
	52.9	19.1	72
	0.2	0.5	0.6
Area, Ethnic, Cultural, and Gender Studies	35	27	62
	45.6	16.4	62
	2.5	6.8	9.3
Biological Sciences (Biology, Botany, Zoology, etc)	797	303	1,100
	808.7	291.3	1,100.00
	0.2	0.5	0.6
Business Administration	513	143	656
	482.3	173.7	656
	2	5.4	7.4
Communications and Journalism	309	68	377
	277.2	99.8	377
	3.7	10.2	13.8
Computer or Information Sciences	248	64	312
	229.4	82.6	312
	1.5	4.2	5.7
Education	189	101	290
	213.2	76.8	290
	2.7	7.6	10.4
Engineering	677	132	809

Table 2.4.

Two-way Tabulation of Major Category Choice & Student Generational Status (Continued)

Major Category	Generational Status		Total
	Continuing	First Gen	
Engineering (Continued)	594.7	214.3	809
	11.4	31.6	43
English Language and Literature	113	60	173
	127.2	45.8	173
	1.2	4.4	6
Family and Consumer Sciences	40	10	50
	36.8	13.2	50
	0.3	0.8	1.1
Foreign Language and Linguistics	72	33	105
	77.2	27.8	105
	0.3	1	1.3
Health, Pre-Health, and Wellness	526	234	760
	558.7	201.3	760
	1.9	5.3	7.2
History	72	39	111
	81.6	29.4	111
	1.1	3.1	4.3
Law, Criminal Justice, and Safety Studies	77	45	122
	89.7	32.3	122
	1.8	5	6.8
Mathematics and Statistics	226	70	296
	217.6	78.4	296
	0.3	0.9	1.2
Natural Resources and Conservation	64	23	87
	64	23	87
	0	0	0
Personal, Hospitality, and Culinary Services	8	8	16
	11.8	4.2	16
	1.2	3.3	4.5
Philosophy, Theology, and Religion	33	10	43
	31.6	11.4	43
	0.1	0.2	0.2
Physical Sciences (Chemistry, Physics, etc)	178	60	238
	175	63	238
	0.1	0.1	0.2

Table 2.4.

Two-way Tabulation of Major Category Choice & Student Generational Status (Continued)

Major Category	Generational Status Continuing	First Gen	Total
Social Science and Public Administration	758	356	1,114
	819	295	1,114.00
	4.5	12.6	17.1
Visual and Performing Arts	253	70	323
	237.5	85.5	323
	1	2.8	3.8
Total	5,271	1,899	7,170
	5,271.00	1,899.00	7,170.00
	39.4	109.4	148.9
Pearson chi2(21) = 148.8612		Pr = 0.000	

A third two-way frequency table found that the relationship between student parental education level, initial major choice, and making a major change was also significant, with 76.9% of first-generation students reporting a major change, X^2 (21, N = 5,050) = 106.0171, p<.000. In particular, the relationship between first-generation student students changing from engineering to a different major accounted for 25% of reported major changes (see Table 2.5).

Table 2.5.

Two-way Tabulation of Major Change & Student Generational Status

Major Category	Generational Status Continuing	First Gen	Total
Agriculture	30	16	46
	34.4	11.6	46
	0.6	1.7	2.2
Architecture and Building Trades	38	18	56
	41.9	14.1	56
	0.4	1.1	1.4
Area, Ethnic, Cultural, and Gender Studies	19	9	28
	20.9	7.1	28
	0.2	0.5	0.7
Biological Sciences (Biology, Botany, Zoology, etc)	576	209	785

Table 2.5.

Two-way Tabulation of Major Change & Student Generational Status (Continued)

Major Category	Generational Status		Total
	Continuing	First Gen	
Biological Sceinces (Continued)	587.3	197.7	785
	0.2	0.6	0.9
Business Administration	363	99	462
	345.6	116.4	462
	0.9	2.6	3.5
Communications and Journalism	200	35	235
	175.8	59.2	235
	3.3	9.9	13.2
Computer or Information Sciences	163	48	211
	157.9	53.1	211
	0.2	0.5	0.7
Education	146	74	220
	164.6	55.4	220
	2.1	6.2	8.3
Engineering	563	103	666
	498.2	167.8	666
	8.4	25	33.4
English Language and Literature	64	36	100
	74.8	25.2	100
	1.6	4.6	6.2
Family and Consumer Sciences	22	5	27
	20.2	6.8	27
	0.2	0.5	0.6
Foreign Language and Linguistics	39	22	61
	45.6	15.4	61
	1	2.9	3.8
Health, Pre-Health, and Wellness	412	177	589
	440.6	148.4	589
	1.9	5.5	7.4
History	45	19	64
	47.9	16.1	64
	0.2	0.5	0.7
Law, Criminal Justice, and Safety Studies	48	25	73
	54.6	18.4	73
	0.8	2.4	3.2

Table 2.5.

Two-way Tabulation of Major Change & Student Generational Status (Continued)

Major Category	Generational Status Continuing	First Gen	Total
Mathematics and Statistics	144	49	193
	144.4	48.6	193
	0	0	0
Natural Resources and Conservation	37	11	48
	35.9	12.1	48
	0	0.1	0.1
Personal, Hospitality, and Culinary Services	4	5	9
	6.7	2.3	9
	1.1	3.3	4.4
Philosophy, Theology, and Religion	16	4	20
	15	5	20
	0.1	0.2	0.3
Physical Sciences (Chemistry, Physics, etc)	141	38	179
	133.9	45.1	179
	0.4	1.1	1.5
Social Science and Public Administration	490	214	704
	526.7	177.3	704
	2.6	7.6	10.1
Visual and Performing Arts	218	56	274
	205	69	274
	0.8	2.5	3.3
Total	3,778	1,272	5,050
Pearson chi2(21) = 106.0171		Pr = 0.000	

To determine possible relationships between the latent constructs a pairwise correlation for career attitudes, academic confidence, major persistence, residential environment, sense of belonging, and major-related support systems was completed. See Table 2.6 for significant correlation coefficients above the .30 trivial threshold. Intra-class correlations and hierarchical linear regression modeling examined the relationship between student generation status and predictors of career attitudes in 5 blocks. First-generation students reported average lower career attitudes than their continuing-generation peers but with a trivial effect (see Table 2.7). While the

institution in which the student reported attending was significant on the student's career attitudes (ICC = .0531, p<.000), the student's year in school was not (ICC = .0095, p=.037).

Table 2.6.

Pairwise Correlations

Variable	Career Attitudes	Academic Confidence	Major Persistence	Residential Environment	Sense of Belonging	Major-related Support Systems
Career Attitudes	1					
Academic Confidence	0.3639*	1				
Major Persistence	0.3221*	0.4524*	1			
Residential Environment	0.2646	0.1437	0.1272	1		
Sense of Belonging	0.3580*	0.2683	0.2245	0.3565*	1	
Major-related Support Systems	0.4404*	0.3021*	0.3099*	0.3374*	0.4521*	1

Note. * denotes .3 trivial effect threshold

Table 2.7.

Mixed Effects Regression Model: Career Attitudes by First-generation Student Status

Careeratt_std |	Coefficient	Std. err.	z	P>|z|	95% conf. interval	
firstgen	-0.0978727	0.0264908	-3.69	0.000	-0.1497937	-0.0459518
_cons	0.1301941	0.0785251	1.66	0.097	-0.0237122	0.2841005

Random-effects parameters schoolid: Identity		Estimate	Std. Err.	95% conf. interval	
	var(_cons)	0.052329	0.0258355	0.0198836	0.1377181
	var(Residual)	0.9397647	0.0157052	0.9094816	0.9710561

LR test vs. linear model: chibar2(01) = 396.12 Prob >= chibar2 = 0.0000

Table 2.8 provides the results of the hierarchical linear modeling analysis for blocks 4 and 5. Both academic confidence and major support systems were found to be significant positive predictors of career attitudes (B=.229 and p<.000; B=.226 and p<.000, respectively). In regard to major, Health Professions students reported higher career attitudes than their peers (B=.206, p<.000). In contrast, students in Arts and Humanities majors reported lower levels of career attitudes than their peers (B=-.239, p<.000). Being a STEM and Social Sciences major was also a significant predictor of career attitudes but with trivial effects. However, it should be noted that a large sample size can influence analysis and the findings of significant effects, as might be the case here (N = 7,170) (see Sullivan & Feinn, 2012). Student parental education level was not a statistically significant predictor of career attitudes when controlling for all other predictors. In response to question 3, since student parental education level was not a significant predictor of career attitudes, no analysis for conditional effects was necessary. Multiple two-sample t-tests for unequal variances were done to understand better student parental education level and its relationship with academic confidence and major-related support systems. Levene's Equality of variances test showed unequal variances for academic confidence and major-related support systems.

First-generation students reported significantly lower levels of academic confidence (M=-.2541, SD=1.146) than their continuing-generation peers (M = .0915, SD = .9248) t(2836.28)= 11.8236, p=.0000) (see Table 2.9). Table 2.10 includes the results of the major-related support systems t-test. First-generation students also reported significantly lower levels of major-related support systems (M=-.1398, SD=1.081) than their continuing generation peers (M = .0504, SD = .9644) t(3052.68)= 6.76, p=.0000).

Discussion

Limitations

The current study does have limitations that need to be addressed. Students from institutions across the United States participated in the survey, resulting in a geographically diverse sample. However, it is not nationally representative as some demographic groups and racial and ethnic identities are underrepresented. This may limit the ability to generalize findings across institutions that did not participate in the study. Additionally, approximately 33% of U.S. undergraduate college students are FGCS (EAB, 2018), which is higher than the percentage represented in this sample. The findings from this analysis provide a starting point for conversation regarding FCGS at public universities across the United States. The current study is also cross-sectional and not longitudinal, limiting the ability to make claims regarding changes in students' major-support systems and career attitudes over time.

Table 2.8.

Results for Hierarchical Linear Regression Analyses Predicting Career Attitudes in Five Blocks

Variable	Block 4				Block 5			
	Coefficient	SE	P	Sig	Coefficient	SE	P	Sig
Gender								
Cisgender Women	0.0087239	0.0226438	0.700		0.0062278	0.0220603	0.778	
Cisgender Men	-0.0466582	0.0245193	0.057		-0.0344251	0.0238956	0.150	
Genderqueer, non-binary, or another	0.0379344	0.0414362	0.360		0.0281972	0.0403710	0.485	
Sexual Orientation								
Bisexual students	0.0052331	0.0340752	0.878		0.0212876	0.0332085	0.522	
Gay students	-0.1334687	0.0557955	0.017	*	-0.1386190	0.0543550	0.011	*
Heterosexual students	0.0780759	0.0266160	0.003		0.0836182	0.0259295	0.001	*
Lesbian students	0.1054132	0.0709135	0.137		0.0854250	0.0690920	0.216	
Queer students	-0.0552534	0.0365362	0.130		-0.0517117	0.0355918	0.146	
Race/Ethnicity								
Asian or Asian American students	-0.1550925	0.0254329	0.000	*	-0.1600458	0.0247724	0.000	*
Black or African-American students	0.0871255	0.0415195	0.036	*	0.0685089	0.0404567	0.090	

Table 2.8.

Results for Hierarchical Linear Regression Analyses Predicting Career Attitudes in Five Blocks (Continued)

Variable	Block 4				Block 5			
	Coefficient	SE	P	Sig	Coefficient	SE	P	Sig
Hispanic or Latina/o/x students	0.0148230	0.0337087	0.660		0.0056010	0.0328378	0.865	
Students with more than one race or ethnicity	-0.0058390	0.0303236	0.847		0.0007651	0.0295449	0.979	
Students with another race or ethnicity (including Native American or Alaskan Native)	0.0120450	0.0500237	0.810		0.0352227	0.0487489	0.470	
White students	0.0469379	0.0214516	0.029	*	0.0499481	0.0208812	0.017	*
Worldview								
Students with another worldview	-0.0119613	0.0356658	0.737		-0.0114215	0.0347429	0.742	
Agnostic students	-0.0459612	0.0271827	0.091		-0.0382019	0.0264850	0.149	
Atheist students	-0.0733604	0.0298654	0.014	*	-0.0782687	0.0290972	0.007	*
Buddhist students	-0.0288740	0.0576972	0.617		-0.0375088	0.0562144	0.505	
Christian students	0.1185349	0.0231642	0.000	*	0.1000349	0.0225836	0.000	*
Hindu students	0.1184182	0.0716880	0.099		0.1115819	0.0698439	0.110	
Muslim students	-0.0280034	0.0772420	0.717		-0.0051928	0.0752608	0.945	
Jewish students	0.0203492	0.0543227	0.708		0.0130242	0.0529190	0.806	

Table 2.8.

Results for Hierarchical Linear Regression Analyses Predicting Career Attitudes in Five Blocks (Continued)

Variable	Block 4				Block 5			
	Coefficient	SE	P	Sig	Coefficient	SE	P	Sig
Students with more than one worldview	-0.0691419	0.0405596	0.088		-0.0540472	0.0395227	0.171	
Year in School								
Second	0.0498667	0.0337220	0.139		0.0519567	0.0328524	0.114	
Third	-0.0891740	0.0347853	0.010	*	-0.0842478	0.0338901	0.013	*
Fourth	-0.0673594	0.0427556	0.115		-0.0743303	0.0416475	0.074	
Fifth Plus	-0.1205531	0.1151410	0.295		-0.1132006	0.1121787	0.313	
Major Aggregated								
Arts and Humanities	-0.2398641	0.0260397	0.000	**	-0.2387064	0.0253678	0.000	**
Business Administration	-0.0200192	0.0279057	0.473		-0.0145284	0.0271839	0.593	
Health Professions	0.2249034	0.0263294	0.000	**	0.2061450	0.0256677	0.000	**
Science, Engineering, or Mathematics	0.1067291	0.0177984	0.000	*	0.0982571	0.0173378	0.000	*
Social Sciences or Education	-0.0717492	0.0186994	0.000	*	-0.0511673	0.0182472	0.005	*

Table 2.8.

Results for Hierarchical Linear Regression Analyses Predicting Career Attitudes in Five Blocks (Continued)

Variable	Block 4				Block 5			
	Coefficient	SE	P	Sig	Coefficient	SE	P	Sig
Major Persistence	0.1635370	0.0111398	0.000	*	0.1293465	0.0109920	0.000	*
First-generation	0.0141156	0.0245308	0.565		0.0271237	0.0238999	0.256	
GPA	-0.0551517	0.0112343	0.000	*	-0.0611701	0.0109465	0.000	*
Academic Confidence	0.2520490	0.0122020	0.000	**	0.2296294	0.0119425	0.000	**
Residential Environment	0.1063449	0.0105617	0.000	*	0.0645370	0.0105079	0.000	*
Campus Sense of Belonging	0.1939893	0.0109823	0.000	*	0.1251507	0.0112567	0.000	*
Major-Related Support Systems					0.2255223	0.0114875	0.000	**

Note. * denotes significance

Table 2.9.

Two-Sample T-test with Unequal Variances: Academic Confidence by First-generation Student Status

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
Continuing	5,271	0.091533	0.0127389	0.9248634	0.066559	0.116506
First-gen	1,899	-0.254064	0.0263073	1.146408	-0.3056584	-0.20247
Combined	7,170	1.11E-08	0.0118097	1	-0.023151	0.023151
diff		0.345597	0.0292293		0.2882837	0.40291
Satterthwaite's degrees of freedom = 3052.68						t = 11.8236

Table 2.10.

Two-Sample T-test with Unequal Variances: Major-Related Support Systems by First-generation Student Status

Group	Obs	Mean	Std. err.	Std. dev.	[95% conf. interval]	
Continuing	5,271	0.05038	0.013284	0.96441	0.024338	0.07642
First-gen	1,899	-0.13984	0.024801	1.08077	-0.188476	-0.091195
Combined	7,170	1.80E-09	0.01181	1	-0.023151	0.0231506
diff		0.19021	0.028134		0.135050	0.2453787
Satterthwaite's degree of freedom = 3052.68					t = 6.7609	

Data disaggregation was undertaken to understand better the experiences of underrepresented student populations in the data. Participants completing the survey could choose from a variety of racial and ethnic identities and multiple identities, as well as enter a response. Participants can choose those identities that most closely describe their racial and ethnic identities, following recommendations of critical quantitative analysis. Disaggregation of the data is not a limitation. However, due to the small number of students in some of these subpopulations, there may not have been enough statistical power to determine if statistical significance exists between the subpopulations and the average student. These underrepresented subpopulations include Black and African American students, Asian and

Asian American students, Latinx and Hispanic students, and students of another race. Because of these limitations, readers are encouraged to consider their institutions in conjunction with this data when making programmatic decisions.

Implications

This paper allows scholars and practitioners to better understand how support systems and major choices influence career attitudes before students leave campus following graduation. Institutions want students to persist to graduation, but institutions also have a vested interest in how their students are successful following college. More specifically, the findings show that continuing-generation status contributes to higher levels of academic confidence and major-related support systems, which positively influence career attitudes. The knowledge and systems that continuing-generation students bring to college help them within a school context, while underrepresented students carry knowledge that may not translate into the school context. This differential allows "dominant groups with society…to maintain power because access is limited to acquiring and learning strategies to use these forms of capital for social mobility" (Yosso, 2005, p. 78). An opportunity presents itself to help overcome institutionalized inequalities through further training career and academic resources on college campuses to help underrepresented students capitalize on the capital they are bringing to campus already (Banuelos, 2021).

These findings support that need, with student self-reporting, that institution of attendance does impact career attitudes. Reframing to focus on the assets that under-studied students bring with them into the college environment could positively impact their connections between home and the college-holding environments. Additionally, assisting students in building those relationships on campus, both curricular and co-curricular, can help students transition into

the interpersonal and institutional stages of Keegan's framework (1982) more easily. Transitioning into Kegan's (1982) interpersonal and institutional stages of development is vital for college students as it enhances interpersonal skills, critical thinking abilities, and adaptability. These stages foster leadership qualities, collaboration skills, and personal growth, preparing students for success in their future careers through participating in college experiences. Progressing through Kegan's stages equips students with the necessary tools to navigate complex social dynamics, thrive in diverse environments, and lead fulfilling lives.

In this study, first-generation students reported significantly lower levels of major-related support systems than their continuing-generation peers. This study also found that both academic confidence and major support systems were significant positive predictors of career attitudes. This reflects the findings of Martin et al., who found that while both first-generation and continuing-generation engineering students acknowledge having social capital in their undergraduate years, the ways social capital was described differed (2020). Those researchers found that first-generation engineering students described social capital as familial support that focused more on emotional support, while continuing-generation students reported that their families provided engineering-focused support and information before and after making their major choice. This provides an opportunity for institutions to assist the families of first-generation students in learning more about their student's chosen major through activities such as touring major-related research labs to help provide more major-specific information to help support their student in meaningful ways.

There are also long-term implications for first-generation students starting and then changing from traditionally more lucrative majors into traditionally less lucrative ones. The results of this study found that fewer first-generation students reported majoring in STEM fields,

with 25% of first-generation student major changes leaving engineering for other majors. According to the National Center for Education Statistics (NCES) (2022), the top 5 earning college majors are related to the engineering and computer science fields, with Electrical Engineers earning, on average, $78,700 compared to $41,400 for social science-related majors such as Psychology. Depending on the field of study, those who have earned bachelor's degrees in social sciences and arts and humanities, on average, had higher unemployment rates than their peers with engineering degrees, except for computer sciences (NCES, 2022). Building up the economic capital required to meet the status quo can take a lifetime. The salaries above demonstrate the large discrepancy that major choice dictates decades into a student's life. Many first-generation students begin their adult lives tens of thousands of dollars behind their continuing education peers. That capital does not include the already-accessible forms of capital available to continuing-education students through accumulated physical and intellectual wealth (Bourdieu, 1986). This disparity contributes to continuing-generation students experiencing the benefits of economic capital earlier in their lives. Ultimately, economic capital influences outcomes elsewhere, including healthier lifestyles and longer lives (see Xu & Jiang, 2020).

When discussing the impact of career in future economic circumstances, internships are a great opportunity when considering paths forward. Internships are critical when discussing demographic factors, majors, and future career options. Research by the National Association of Colleges and Employers (2023) shows that populations such as women, Black, and Hispanic students are overrepresented in unpaid internships and that many of those unpaid internships are significantly more common in the arts, sciences, and helping fields where these same populations tend to be overrepresented. The division between paid and unpaid internship opportunities negatively influences student outcomes and exacerbates systemic disparities. Research shows

that paid internships favor male, white, and continuing-generation students. Consequently, this group tends to secure more job offers and higher starting salaries, perpetuating and intensifying the unequal impact throughout those students' lives (see NACE, 2022).

Conclusion

Several possible further areas of study exist concerning college student career attitudes. The impact of qualitative data regarding major-related support systems and the impact on student career attitudes is one such avenue. Integrating real-life experiences from students can help further enlighten staff, faculty, and administrators about the real lived experiences of the students they are surrounded by daily. For those in these support roles, this could help when advocating for program funding. Conversations between faculty and staff could help to connect those students in majors that noted lower levels of career confidence with proactive, relationship-building interventions, such as mentoring and internships. Institutional supports, such as professors and advisors, influence first-generation students' career exploration opportunities and persistence in their engineering major (Martin et al., 2020). Proactiveness could help students better understand what types of activities would help build student confidence before graduation and advocate for those experiences. Focusing on graduate students and their career attitudes is another avenue. The impact of generational student status does not end once a student graduates with their four-year degree. This study and future studies could highlight the need for high-impact practices and useful resources and utilizing data to understand how students are impacted by their generational status. By integrating specific types of major-related support systems that can positively influence confidence in one's major, greater impact can be achieved while building the career confidence of future graduates.

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CHAPTER 3: MEASURING THE CAREER ATTITUDES CONSTRUCT: USING RASCH TO DETERMINE VALIDITY AND RELIABILITY OF PILOTED ITEMS

It is students' hope and intent to attend college to build skills, create connections, and prepare themselves to enter the workforce. College students are tasked with making significant decisions regarding major choice, lifestyles, relationships, and future careers within their time at college. Each student builds their attitude toward what they view as career successes and failures based on their support, successes, and failures throughout college. Even more, college students have widely varying views on what they consider to be the most significant moments in their professional lives. For example, Martin et al. (2022) found that what is considered a significant professional life event, such as promotion and graduating from college, was impacted by generational student status and cultural background. The Assessment of Residential Collegiate Environments (ACREO), and this dissertation, defines career attitudes for college students as their perception of how their academic and non-academic experiences impact the skills and abilities needed to succeed in careers following graduation. Career readiness, a concept closely related to career attitudes, is "a foundation to demonstrate requisite core competencies that broadly prepare the college-educated for success in the workplace and lifelong career management" (NACE, 2021). Participation in activities and experiences plays an important role in building career attitudes. These activities put students in the driver's seat regarding career exploration. Exploration within the college environment allows students to learn their likes and dislikes before full-time employment following graduation.

Previous research has shown a connection between college experiences and career satisfaction. For instance, the Gallup Purdue Index (Ray & Marken, 2014) found that students who had a strong relationship with a faculty member who was passionate about their career were

more likely to be engaged and content in their work, even years later. However, there is a lack of literature exploring the influence of mentoring, and connections on college student's perception of career attitudes, with most existing research focusing on measuring career attitudes focused on high school student populations (see Healy et al., 1985; Dorn & Welch, 1985; Kenny et al., 2003; Powell & Luzzo, 1998).

Currently, the NACE Student Skills Survey is the only validated tool for assessing career readiness in college students. However, it primarily measures students' self-reported experiences in job recruitment, career services, and experiential learning and their impact on career readiness. The other validated tools focus on the career attitudes of professionals who have entered the workforce. However, no validated instruments are specifically designed to measure career attitudes in college students. The lack of tools measuring student attitudes toward their potential career readiness limits the ability to measure this construct. The ability to better understand students' beliefs regarding their career attitudes is the basis for the implementation of evidence-based curricular and co-curricular programming at the collegiate level.

This study aims to pilot and psychometrically test new items for possible addition to the Assessment of Residential Collegiate Environments (ACREO) Perception of College's Role in Career (Career Attitudes) scale. These questions can assist scholars in better understanding how major choice and major-support systems influence college students' persistence. The following research question guides this proposed study: To what extent do the piloted items on the Perception of College's Role in Career scale accurately measure the validity and reliability of the career attitudes construct?

Before instrument discussion, I will discuss existing career-related frameworks and current Social Cognitive Career Theory research. Following a positionality statement, I will lay

out the proposed instrument and methods for analysis. Lastly, I will discuss methods, results, and the implications of the analysis.

Career-Related Theoretical Frameworks

Five career-related theoretical frameworks address career development across the lifespan. The frameworks are (1) the Theory of Work-Adjustment (see Dawis & Lofquist, 1984), (2) Holland's Theory of Vocational Personalities in Work Environment (see Holland & Asama, 1993), (3) the Theory of Vocational Development formulated by Super (1953) recently, the Life-Span, Life-Space Theory (Super, 1980), (4) Gottfredson's Theory of Circumscription, Compromise, and Self-Creation (2002), and (5) Social Cognitive Career Theory (see Lent et al., 2002). While a brief introduction to each framework is below, Social Cognitive Career Theory is the foundation for this research.

Theory of Work-Adjustment

The Theory of Work-Adjustment, introduced by Dawis and Lofquist in 1969, focuses on the reciprocal relationship between individuals and their work environment. This relationship, referred to as *correspondence*, emphasizes that individuals strive to establish and maintain a compatible connection with their work environment. This relationship is built and maintained to achieve success, such as promotions, salary increases, and prestige. The satisfaction derived from this relationship measures an individual's success and mutually benefits both parties involved (University of Minnesota, 2023).

Theory of Vocational Personalities

Holland's Theory of Vocational Personalities in the Work Environment, last revised in 1997, explores how an individual's personality traits influence their satisfaction with daily work tasks and relationships. By categorizing individuals into specific personality types using

RIASEC (Realistic, Investigative, Artistic, Social, Enterprising, Conventional) codes, this theory helps individuals gain insights into their preferences, strengths, and how their personality may impact their satisfaction in particular occupations. Due to its connection to self-knowledge, Holland codes are commonly utilized in career counseling to help individuals understand perceived educational and career barriers (Nauta, 2010). For example, Lindley found that "women who chose an investigative or a conventional occupation perceived significantly more career barriers than women who chose a social occupation" (2005, p. 281). Career counseling can assist individuals in understanding how their likes, dislikes, goals, and personality traits can change as they develop, influencing their happiness in a potential future career.

Theory of Vocational Development

Career choice does not spontaneously occur at a predetermined point in one's life. Development throughout the lifespan is a factor in career choices, motivating students to seek out specific experiences that fit well with who they are. The following two theories discuss occupational development through self-concept, or identity, from early childhood through adulthood. Developed in the 1950s, Super's Theory of Vocational Development focused on five main stages in the development of self-concept: Growth, exploration, establishment, maintenance, and disengagement. Each stage has developmental milestones influenced by factors such as maturity and experiencing reality (Super, 1953). Super believed that self-concept, or knowledge about oneself and its relation to one's career, was an ever-evolving process throughout the human lifespan.

Rather than choosing one career path and staying on that path, new experiences could significantly influence our identities, pushing individuals into different stages at various times, in what Super (1980) called the life-span, life-space process. The life-span, life-space concept

played such a significant role in the continued development of the theory that Super (1980) developed the Life-Span, Life-Space Theory, focusing on life spaces, lifestyles, life cycles, and career patterns. Through utilizing the Life-Career Rainbow, Super (1980) argues that there are nine major roles that individuals may occupy regardless of gender throughout their lifetime across four principal theatres (a) the home; (b) community; (c) school; and (d) the workplace. These roles may often be played simultaneously and are influenced by social, personal, and cultural factors within the theatres or life spaces (Super, 1980, p. 287). The Life-Span, Life-Space approach is intended to provide a wider perspective on the influence of various roles throughout the lifespan and how roles can influence one another.

Theory of Circumscription, Compromise, and Self-Creation

The idea of self-concept was also a foundational piece for Linda Gottfredson's Theory of Circumscription, Compromise, and Self-Creation. First published in 1981 and later revised in 1996 and 2002, the theory explores how children age three through adolescence develop and internalize interests, values, and societal expectations to build self-concept. In building self-concept, Gottfredson argues that individuals choose careers that match their understanding of themselves and how they understand those careers at different stages of childhood (2002, p. 93). Related to self-concept is self-efficacy, the foundation of Social Cognitive Career Theory, the guiding framework of this analysis.

Social Cognitive Career Theory

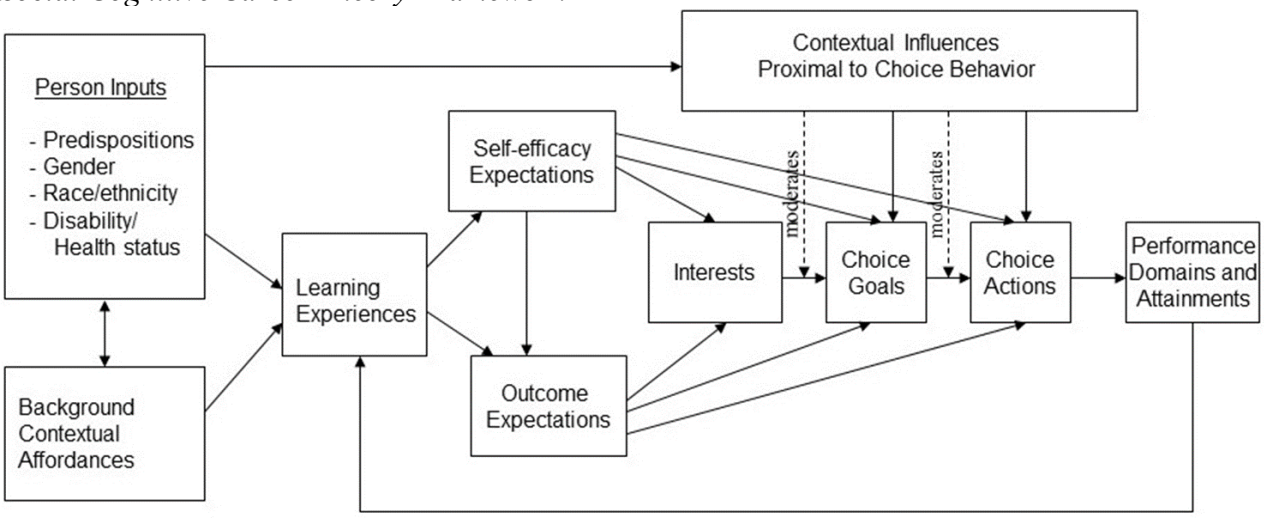
Social Cognitive Career Theory (SCCT) contends that individuals are active agents in their career development (see Figure 3.1). SCCT focuses on understanding how inequities like age, gender, and economic status influence students' career choices and ability to be successful in school and the workplace (Hardin et al., 2021). Bluestein et al. (2002) found that young adults

from lower socioeconomic backgrounds were more likely to view career choices regarding work as a means to survive and make money than their peers from higher socioeconomic backgrounds, who view happiness as a primary factor in their career choices. These decisions have a lasting impact on experienced well-being, or feelings during specific moments in life, as well as evaluative well-being, or people's evaluation of their lives (Killingsworth, 2021). While older research shows that income above $75,000 does not correlate with improved well-being, newer research contradicts those findings. In a study of over 33,000 employed U.S. adults, Killingsworth (2021) found that the higher the income, the more likely participants were to respond with higher levels of both experienced and evaluative well-being. However, more than income, relationships really determine happiness throughout life. In fact, research shows that interpersonal relationships determine overall happiness more than any other variable (Veritasium, 2023).

A concept included within SCCT is self-efficacy, where an individual's actions and choices are influenced by their confidence in their abilities to complete tasks to attain specific goals (Bandura, 1997). According to self-efficacy theory, "people acquire information to evaluate efficacy beliefs from four primary sources: (a) enactive mastery experiences (actual performances); (b) observation of others (vicarious experiences); (c) forms of persuasion, both verbal and otherwise; and (d) 'physiological dysfunction'" (Artino, 2012, p. 78). Identity development, when influenced by factors such as environment and experiences, leads individuals to build confidence in their ability to be successful in a career path (Hardin et al., 2021). These beliefs shift and change as we grow, creating more interest regarding career choices (see Lent et al., 2022, p. 255).

Figure 3.1.

Social Cognitive Career Theory Framework



Note. Lent & Brown, S. D. (2019). Social Cognitive Career Theory at 25: Empirical Status of Interest, Choice, and Performance Models. *Journal of Vocational Behavior*, 115, 103316-. https://doi.org/10.1016/j.jvb.2019.06.004

In the case of college students, self-efficacy can influence what major a student chooses (Betz, 2007). Students may avoid a particular major based on their notions of what they can be successful at while trying to avoid barriers. The inability to participate in experiences that encourage exploration within that major and encountering barriers can influence career development, leading to career distress. When struggling with career distress, students can feel anxiety, depression, and other mental health concerns that can negatively influence career development processes, such as major and career exploration (Creed et al., 2016). Barriers, such as first-generation student status, working, or being a parent, can play a role in whether or not a student can participate in confidence-building activities. The role of academic and non-academic support systems, such as friends and family, has been increasingly recognized as having a significant impact on student's career exploration and goals.

Student activities, such as major-related organizations and experiential learning, can influence the development of career attitudes. Students can connect to potential career-

preparedness activities through academic and co-curricular activities, and participation in these activities can lead to meaning-making. Meaning-making recognizes the significant role that community, programming, and resources play in the success of students (Magolda, 2009). Meaning-making activities can provide a foundation for building a sense of belonging on college campuses. Activities that contribute to a sense of belonging integrate opportunities for connection and can significantly impact students personally and professionally (Chickering & Reisser, 1993). One such example is mentoring. Previous studies (Raymond et al., 2021) have found that integrating student/employer mentoring into the student experience makes students feel more career-ready and prepared to enter the workforce following graduation. Institutions can provide experiences that contribute to students' understanding of their identity. Students have to actively engage in identity-building by seeking out first-hand experiences and professional organizations (Daniels & Brooker, 2013). When participating in such activities, college students explore connections, build knowledge, and networks that can influence career choices.

Career exploration and experiential learning, such as career courses, internships, and job shadowing, provide valuable opportunities for building self-efficacy, especially when combined with good mentorship (see McDonald & Wilson-Mah, 2022). Previous research has shown that connecting students in the classroom can positively impact their willingness to explore different majors and careers (Fouad et al., 2016). While Lent et al. (2016) found that exploration can positively influence decisional self-efficacy concerning career, more research is needed to understand how exploration influences students' confidence in making career decisions (also see Chen et al., 2022). Exploration and experiential learning also allow students to get feedback from peers and supervisors. In some cases, these activities also allow students to witness how their peers interact within their workplace environment. Students can then better understand how their

perception of their level of skills compares to the feedback gathered from others, known as calibration (Artino, 2012). This feedback is particularly impactful as current research by the National Association of Colleges and Employers shows different perceptions of skill competency of students following graduation. Students consistently report high confidence in using transferable skills, such as collaboration, communication, problem-solving, and critical thinking (NACE, 2022b). However, employers consistently rate students' ability to succeed using these skills as lower than student rankings of the same skills (NACE, 2022a). While not necessarily negative, this disconnect shows that further research is needed to understand how students can understand how their academic and non-academic experiences build valuable workplace skills.

Positionality

Having previously worked in higher education in a role that integrates career exploration and readiness, I see career development as an integral part of building identity in college. I am also part of the ACREO research team and am invested in continuously improving a tool that I have helped bring to various college campuses across the U.S. This role enables me to understand how collegiate environments impact students' sense of belonging and I firmly believe that research and the resulting data should drive positive change and improve the overall student experience. As a first-generation college student (FGCS) who attended an out-of-state university, I am particularly interested in how students of different backgrounds navigate college and available resources. As an FGCS, I did not know how activities such as networking and internships can impact a student’s ability to find a job after graduation. There was a level of initiative that was required to be prepared for a job after graduation that I was unaware of. Part of this was influenced by having never seen a college graduate navigate the job market, and I had

no prior relationships or connections to the campus I attended. This lack of connection left me even less prepared to reach out to professionals in the areas I was interested in finding jobs.

I also identify as a white, agnostic, and heterosexual female. Two of those identities, being white and heterosexual, mean that I will never experience some of the barriers that other students face. As an agnostic living in a state that values religion, it can be challenging to connect with others in an area where many do connect based on religious affiliation. These identities influence how I view my research, especially when gathering student success and persistence data. I recognize that my experiences and career so far impact how I believe students should build career attitudes while in college.

Methods

Data

This study utilizes data from the Spring 2023 Assessment of Residential Collegiate Environments (ACREO) administration. The survey was sent to 4985 students at one public university in the Far West of the United States. The overall response rate was 12.3% (N=611). Data cleaning, which removed respondents who responded to less than 80% of the survey, and a listwise deletion yielded a final sample of 229 student respondents (37.5% usable data rate). See Table 3.1 for demographic data. ACREO, first administered in 2015, focuses on "assessing the influence of the varied residential environments on the academic, intellectual, and social development of college students" (Dahl et al., 2022, p. 7).

ACREO uses Astin's (1993) Inputs-Environments-Outcomes framework. Astin's I-E-O framework posits that pre-collegiate characteristics such as generational status and race, as well as environments like residential environment and campus climate, influence student outcomes, like career attitudes (Dahl et al., 2022). The intended respondents are students living on the

college campus where the survey is administered. The tool is updated regularly to address significant trends relating to higher education and popular culture that impact students. The survey is multi-institutional, and the data collected is generalizable.

Table 3.1.

Student Demographic Information (N = 229)

	N	%
Gender (Aggregated)		
Cisgender man	58	25.89
Cisgender woman	129	57.59
Genderqueer, non-binary, or another	35	15.63
Transgender man and woman	2	0.89
Social class		
Poor	8	3.57
Working class	25	11.16
Lower-middle class	31	13.84
Middle class	87	38.84
Upper-middle class	70	31.25
Upper class	3	1.34
Undergraduate Class Year		
First-year	176	78.57
Second-year	35	15.63
Third-year	9	4.02
Fourth-year	3	1.34
Fifth-year plus	1	0.45
Major Category (Aggregated)		
Arts and Humanities	46	20.09
Business Administration	33	14.41
Health Professions	20	8.73
Science, Engineering, or Mathematics	49	21.4
Social Sciences or Education	57	24.89
No Major Selected	24	10.48

ACREO has three primary guiding questions that examine how student experiences and outcomes differ by residential environments (Dahl et al., 2022). The instrument includes approximately 259 items grouped into scales and takes approximately 20 minutes to complete. While ACREO does ask questions about curricular and co-curricular experiences, which can

include activities like internships, it does not ask specific questions about whether students have had an internship or career experience. ACREO also does not ask about the quality of career-related activities, like internships.

ACREO Career Attitudes Scale. The Career Attitudes scale, used by ACREO (2021), is a 5-item index intended to measure students' perceived confidence in their ability to find a well-paying job following graduation as well as a job that aligns well with their major skills (alpha=.890). Originally, two scales were developed as part of the National Study of Living Learning Programs (Inkelas & Associates, 2006).The first attempt at a combined scale to measure career outcome expectations used a Likert scale from *strongly disagree* to *strongly agree* (see Dahl et al., 2019; Table 3.2). The scale was updated in 2021 to reflect career attitudes as confidence by changing the response options to 1-*Not Confident At All* to 5-*Confident*.

Table 3.2.

Current ACREO Career Attitudes Items

Item Prompt: How confident are you in your abilities to	Item Label
Receive a good job (or graduate school) offer after graduation	A
Find a job with a desirable salary	B
Find a job that you would find satisfying	C
Find a job that can "make a difference" in people's lives	D
Apply skills developed in my major to my job	E

Pilot Items. The survey also included 18 new items and three Vocational Identity Scale items in addition to the original ACREO items. The pilot items (see Table 3.3) integrate the significant themes of exploration, community, wonder, and vulnerability. Piloted items can be written to reflect significant concepts found in literature reviews, topic-related theories, and best practices related to the construct of interest (Robinson, 2018). Knowledge gathered from career-related research, career theories, publications, training, conferences, and real-life experience as a Career Coach were all influential when creating the piloted items. All current and pilot items

used a 5-point Likert scale (*1-Not Confident At All to 5-Confident*). The items were presented in the same order in the survey sent to students, from perceived least difficult to most difficult. Specific terminology that may be unfamiliar had a definition provided.

Table 3.3.

Proposed Career Attitudes Items

Item Prompt: How confident are you in your abilities to	Item Label
Understand how my courses contribute to my job interests	F
Find an internship that will help me explore job options	G
Explore new major-related career paths	H
Make connections with students interested in similar careers	I
Know how to make professional connections with potential employers	J
Network successfully with professionals in my field	K
Wonder about the possibilities of my future career	L
Implement feedback to improve job skills	M
Seek out assistance to learn about career options following graduation	N
Understand the impact of my work on my mental health	O
Explore professional opportunities outside of my comfort zone	P
Recognize personal values that would benefit me in my career	Q
Recognize desirable, transferable skills for a job	R
Find a job that provides work/life balance	S
Find a job that I feel proud of	T
Reach out to others if I need career help	U
Discuss mistakes I have made to help improve my career skills	V
Advocate for opportunities in my job	W

The Vocational Identity Scale. The Vocational Identity Scale combines two previously validated scales, the Vocational Decision-Making Difficulty Scale and the Identity Scale (APA, 2023). The scale, administered to high school and college undergraduates, was found to have a high reliability of alpha =.96 (Gupta et al., 2015). Five of the items measure career attitudes. For this study, the tool sent to students included three items to test construct validity (see Table 3.4). Two of the items lacked clarity due to double barreling and negative direction. Double-barreled items ask respondents to respond to two ideas within the same items, leaving no space for

researchers to know which idea the response applies to (DeVellis, 2012, p. 82). While negatively directed items can help to mitigate agreement bias, these items can also run the risk of being confusing to respondents (DeVellis, 2012, p.84). Three negatively worded items were removed to improve the survey clarity and experience. The VIS items were compared to the piloted items to determine construct validity. Construct validity is an appropriate choice as this analysis focuses on measuring a construct unobservable to the human eye.

Table 3.4.

Vocational Identity Scale Items

Item	Intertotal Correlation
I can readily envision what kind of work I want to be doing when I graduate	0.84
I could easily describe my ideal job to a recruiter	0.72
I know what kind of work suits me best	0.73

Specific ACREO Scale Inclusion. The analysis also compared items from each scale below to determine construct validity. These scales were validated using exploratory factor analysis and Rasch analysis as part of the ACREO survey. Each scale includes items that ask students about their career-related experiences in and out of the classroom.

The scales and their descriptions (ACREO, 2021) include:

Discussed Learning with Peers (alpha=.959): Students reported when they discussed classroom learning outside the classroom with peers.

Non-Course Related Faculty Interaction (alpha=.916): Students report their discussions relating to non-classroom activities such as career, interests, and other non-course related topics, as well as their courses with faculty.

Co-Curricular Programming Engagement (alpha=.903): Students living on-campus report their participation in programming associated with their living environment, including career workshops.

Major Related Support Systems (alpha=.851): Students report their perceived support from peers, mentors, family, and within chosen majors.

Analysis

The analysis uses exploratory factor analysis (EFA) and Rasch modeling to assess internal consistency reliability and construct validity. EFA limits the items from loading onto multiple latent constructs and is appropriate for measuring a construct that is internal to the individual. Career attitudes are considered a latent construct in this context. Latent constructs are measures that cannot be visually measured, "such as attitudes, satisfaction, motivation, self-efficacy and acceptability" (El-Den et al., 2020, p.327).

This analysis uses Wolfe & Smith's (2007) conceptualization of Messick's (1995) unified construct validity framework. Messick (1995) described determining validity as gathering evidence and the resulting argument supporting the researchers' inferences and findings (p. 747). According to Messick (1995, p. 474), "both meaning and values are integral to the concept of validity…" Six areas of construct validity are examined to support validity arguments concerning instrument development: content, substantive, structural, generalizability, interpretability, and consequential. The content aspect of validity pertains to how well the content of a test or assessment instrument aligns with the specific construct or trait it is intended to measure. This aspect of validity examines whether the content of the survey is a valid reflection of what the survey is designed to measure, ensuring that it accurately measures the intended construct. The substantive aspect of validity assesses whether the theoretical underpinnings of a test accurately

explain the observed responses, ensuring that the survey is a valid measure of the intended construct or trait. The structural aspect of validity assesses how well a survey's structure matches the theory it aims to measure, ensuring that the survey is a valid measure of its intended construct. The generalizability aspect of validity examines how items and surveys are generalizable across different populations. The external aspect of validity focuses on the extent to which the scores on the assessment relate to other measures and behaviors as predicted by relationships between constructs and the theory of the construct being assessed (see Messick, 1995). The piloted items will not be used to create testing standards or scores; therefore, this analysis did not examine the consequential aspect of validity.

Rasch modeling "is built on the assumption that the most parsimonious and effective predictor of a trait is the relationship between the difficulty of an item and the ability of the person" (Columbia University, 2023). Rasch modeling allows for examining if items are too easy or hard for students to answer based on their responses by comparing the collected data against an idealized Rasch model. Using a linear interval scale ' logit ' unit of person measurement, Rasch modeling also helps address unequal Likert scale ratings for and between individual responses on items (Boone & Noltemeyer, 2017). The creation of "linear person measures… allow researchers to use a respondent's raw test or scale scores and express the respondent's performance on a linear scale that accounts for the unequal difficulties across all test items" (see Boone, 2016, p.3). Combined with the empirical data, the idealized model illustrates where items and person outliers occur and should be evaluated to fit the data to the idealized Rasch model (Columbia, 2023).

Rasch modeling fits appropriately with Social Cognitive Career Theory and is an analytical model that can assess latent constructs, including career-related ones (see Nam et al.,

2011; Creed et al., 2016). Additionally, Rasch measures fit, floor, and ceiling effects. Fit statistics help determine if items should be removed, reworded, or maintained. If the analysis shows that there are floor or ceiling effects, that will demonstrate that easier or harder items could be added to help improve the range of difficulty of the measure (Granger, 2008). Because preceding items can influence responses to later items, the items were analyzed to determine an appropriate item order to obtain reliability and validity as accurately as possible (Pew Research Center, 2022).

Results

The results follow Wolfe & Smith's (2007) conceptualization of Messick's (1995) Rasch construct validity processes. Rasch modeling analysis was done using Winsteps (version 3.92.1) software. All methods of this analysis were conducted using the Rating Scale Model (RSM), as all of the items use the same response format. Each item has more than ten observations (see Linacre, n.d.d). Table 44 in Winsteps software was used to determine global fit statistics, which helps to answer if the data fit the model usefully (Linacre, n.d.c). The global fit statistics for items B, C, and E were determined to be .4996 with an expected value of .5107, indicating a better fit or overfit to the model. The global fit statistics for items H-K was determined to be .5292 with an expected value of .5464, indicating a better fit or overfit to the expected model. The global fit statistics for items Q, R, and W were determined to be .4562 with an expected value of .4741, indicating a better fit or overfit to the expected model (see Table 3.5).

Step 1: Structural Aspect of Validity

Polychoric Exploratory Factor Analysis and parallel analysis were used to assess unidimensionality. Any factor loadings smaller than .3 were removed from the analysis (Field, 2013). The initial rotated factor analysis confirmed three-factor loadings for 23 items (see Table

3.6). To ensure the items met the assumption of unidimensionality for Rasch analysis, a secondary EFA was run, separating the items into three groups, with each group loading onto a singular factor. The three groups were Items B, C, and E; Items H-K; Items Q, R, and W. Items were removed first based on the level of uniqueness, then by lower factor loadings (see Table 3.7). All item uniqueness was less than .6, demonstrating that all items were explained by the retained factors (Al Amin & Qin, 2023). Parallel analysis also confirmed the need to run each group independently (see Figure 3.2). The remaining items are unidimensional and were run in their respective item groups in Winsteps to retain unidimensionality.

Table 3.5.

Global Fit Statistics for Rating Scale Model (RSM)

Items H-K		
Model	Log-likelihood chi-squared	d.f.
RSM	1342.8384	1384
Items B, C, & E		
Model	Log-likelihood chi-squared	d.f.
RSM	914.5289	954
Items Q, R, & W		
Model	Log-likelihood chi-squared	d.f.
RSM	801.6856	859

Figure 3.2.

EFA Final Parallel Analysis: Remaining Items

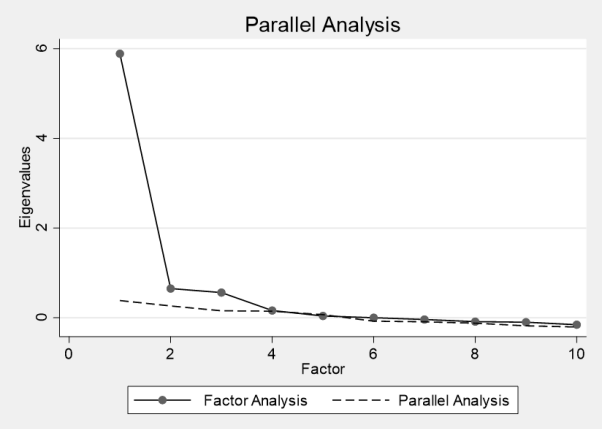


Table 3.6.

Exploratory Factor Analysis: All Items

Variable	Factor1	Factor2	Factor3	Uniqueness
career_att~a		0.5857	0.616	0.2636
career_att~b		0.6307	0.5445	0.297
career_att~c		0.7929		0.2042
career_att~d		0.6017		0.4686
career_att~e		0.7251		0.2987
career_att~f		0.6768		0.3996
career_att~g		0.4565	0.5188	0.4605
career_att~h		0.4741	0.4997	0.3802
career_att~i			0.5203	0.4437
career_att~j			0.7659	0.2271
career_att~k			0.8299	0.1502
career_att~l	0.4985	0.4479		0.4604
career_att~m	0.5352			0.5677
career_att~n	0.5667		0.477	0.4388
career_att~o	0.6231			0.5037
career_att~p	0.4726		0.5004	0.4716
career_att~q	0.7765			0.2276
career_att~r	0.6763			0.3424
career_att~s	0.5255			0.4951
career_att~t	0.543	0.5957		0.3101
career_att~u	0.5594		0.5805	0.3258
career_att~v	0.64		0.4543	0.3502
career_att~w	0.6567		0.4709	0.2972

Table 3.7.

Final Exploratory Factor Analysis: Remaining Items

Variable	Factor1	Factor2	Factor3	Uniqueness
career_att~h	0.4932			0.4094
career_att~i	0.6295			0.3426
career_att~j	0.8367			0.1428
career_att~k	0.8480			0.1216
career_att~b			0.7188	0.2844
career_att~c			0.7706	0.207
career_att~e			0.5459	0.3685
career_att~q		0.8101		0.1875
career_att~r		0.7710		0.2322
career_att~s		0.4899		0.4673
career_att~w		0.5832		0.3293

Step 2: Content Aspect of Validity

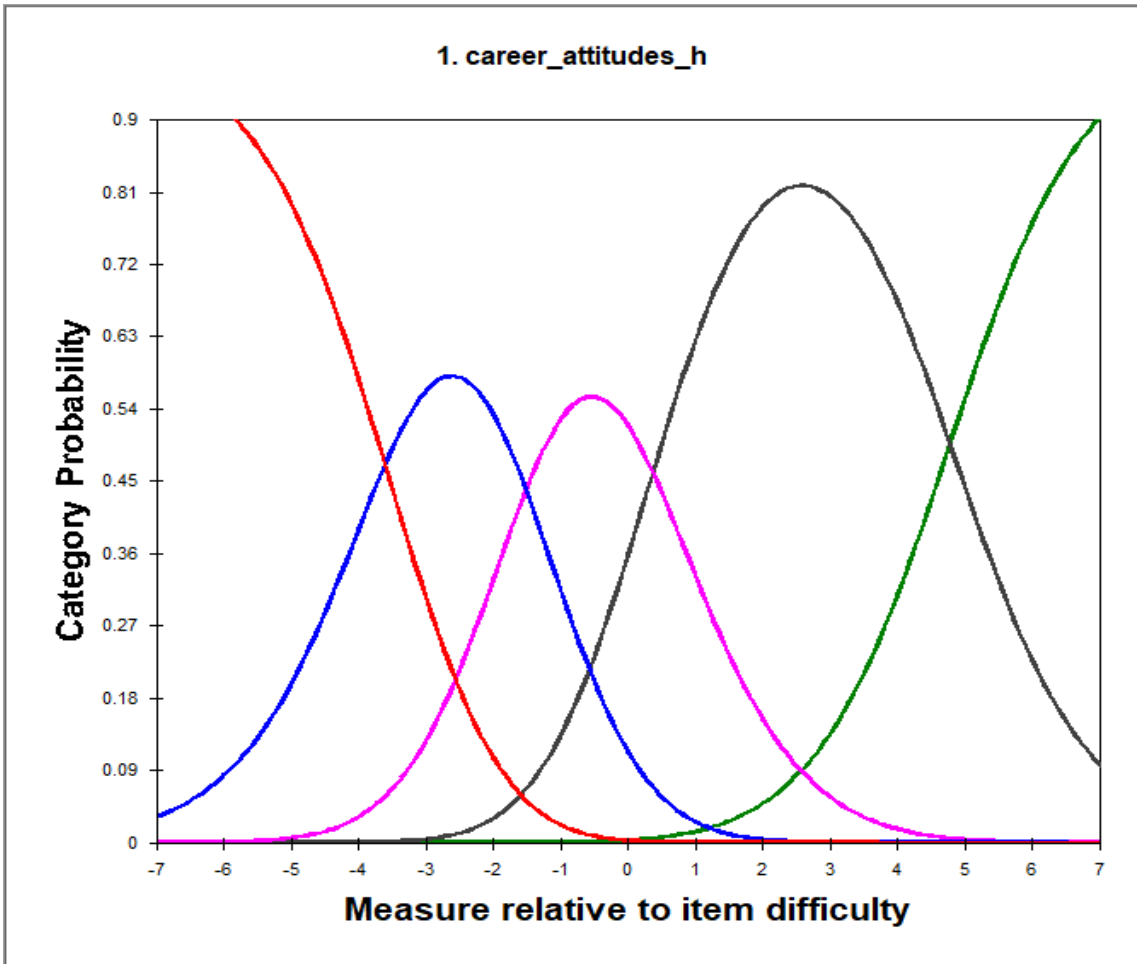
In Rasch models, items and persons are fit to the model. Those items that are determined to be misfitting are removed. Using Table 10 in Winsteps, item fit statistics were examined to understand how well the piloted items fit the model. The outfit mean-square values (MNSQ) were examined using the standard range of .5 to 1.5 logits to determine productive measurement. All items fall below the 2.0 logit threshold recommended for samples of less than 1,000 (Wolfe & Smith, 2007). Additionally, all items have a biserial correlation larger than .30, and no items exhibit a biserial correlation difference of greater than .15, indicating consistency across average scores between each specific item and the remaining items (Wolfe & Smith, 2007).

Figure 3.3 presents the category probability response curves for each respective group, which help to depict the likelihood of an individual with a specific latent trait level choosing a particular category (see Khadka et al., 2012). All category probability curves look normal, with all item responses peaking where that response is the most probable (Boone & Noltemeyer, 2017). The statistics demonstrate that the items are reliable and valid. Table 3.8 presents the Item

Misfit Statistics for all items. However, two of the examined scales, B, C, and E, as well as Q, R, and W, only included three items. Convention recommends that a scale consist of a minimum of four items to test internal reliability (Robinson, 2018) more accurately. Because of this, items B, C, E, Q, R, and W were removed from the analysis. Removing those items left items H-K for the remaining analysis and maintained unidimensionality since those items all loaded onto the same factor.

Figure 3.3.

Category Probability Curve



Note. Rasch Model Category Probability curves for Item Groups illustrating item response in relation to item difficulty across five categories (*1-Not Confident At All to 5-Confident*).

Table 3.8.

Item Statistics: Misfit Order

Item Label	Score	Count	Measure	Model S.E.	Infit MNSQ	Infit ZSTD	Outfit MNSQ	Outfit ZSTD	Observed Point-Biserial Correlation	Expected Point-Biserial Correlation	Estimated Discrimination
Find a job with a desirable salary	491	203	0.87	0.13	0.97	-0.20	0.97	-0.2	0.85	0.86	1.03
Find a job that you would find satisfying	535	203	0.15	0.13	0.73	-2.80	0.68	-3.1	0.88	0.84	1.29
Apply skills developed in my major to my job	599	203	-1.02	0.14	1.31	2.60	1.34	2.6	0.78	0.82	0.72
Explore new major-related career paths	545	203	-0.50	0.13	1.34	3.10	1.29	2.5	0.75	0.81	0.66
Make connections with students interested in similar careers	566	203	-0.84	0.13	1.12	1.10	1.09	0.9	0.79	0.80	0.84
Make professional connections with potential employers	478	203	0.50	0.12	0.72	-3.00	0.69	-3.1	0.88	0.84	1.28
Network successfully with professionals in my field	454	203	0.84	0.12	0.73	-2.90	0.78	.-2.1	0.89	0.85	1.23
Recognize personal values that would benefit me in my career	538	188	-0.39	0.15	0.77	-2.20	0.72	-2.3	0.85	0.83	1.16
Recognize desirable, transferable skills for a job	542	188	-0.48	0.15	0.98	-0.10	0.88	-0.9	0.82	0.83	1.03
Advocate for opportunities in my job	475	188	0.88	0.14	1.17	1.40	1.18	1.4	0.86	0.86	0.84

Step 3: Substantive Aspect of Validity

The substantive aspect of validity assesses how well theoretical explanations explain consistent item responses related to content and cognitive processing models (Wolfe & Smith, 2007). Person fit and monotonic functioning were examined to determine substantive validity. Person fit of the 229 participants was examined using Table 6.1 in the Winsteps software. For items H-K, 70 persons were removed for underfitting the model (Outfit MNSQ values below .50). Seventy-three persons were removed with Outfit MNSQ values greater than 1.50. After the final person removal, the final item and person reliability values were .99 and .98, respectively.

Two indicators, item polarity and rating scale analysis, were used to determine monotonic functioning for items H, I, J, and K. Monotonic functioning refers to the consistent directional relationship between variables; As one variable increases or decreases, the other variable does as well (Monotone Functions, 2023). Item polarity was ascertained using Table 26.1 in Winsteps software. All items demonstrated positive polarity, meaning higher-valued responses to the items correlate positively with the latent variable, and no misordering is present (Linacre, 2011).

The piloted items utilized a Likert, or polytomous, response scale. Rating scale analysis, Table 3.2 in Winsteps, was used to determine substantive validity (see Table 3.9). All items have positive biserial point correlations, meeting the required preliminary guideline to do a rating scale analysis. Rating scale analysis "provides evidence to confirm that the responses to the rating scale behave in a manner consistent with the intentions of the item developers," using four primary guidelines (Wolfe & Smith, 2007, p.209). Each of the five categories had a minimum of 10 samples, meeting the first guideline. The scale distribution is unimodal and smooth regarding the second guideline. The observed average for each category within each group increased, and no category thresholds were disordered, demonstrating that the respondent rating scale is

consistent across items meeting the third guideline (Wolfe & Smith, 2007). However, as the model is polytomous, disordering is not considered an issue (Linacre, n.d.b). No Infit MNSQ and Outfit MNSQ values were above 1.5.

Table 3.9.

Items H-K: Response Category Structure: Person Fit

Category		Observed		Observed	Sample	INFIT	OUTFIT	Andrich	Category	
Label	Score	Count	%	Average	Expected	MNSQ	MNSQ	Threshold	Measure	Response
1	1	20	6	-13.52	-13.40	0.83	0.73	NONE	(-12.64)	Not Confident at All
2	2	54	16	-6.00	-6.01	0.98	0.94	-11.54	-7.99	2
3	3	90	27	-1.48	-1.49	1.00	0.88	-4.44	-1.11	3
4	4	62	19	5.06	5.04	1.01	0.98	2.22	7.99	4
5	5	106	32	15.00	15.10	1.03	0.72	13.75	-14.85	Confident

Step 4: Generalizability Aspect of Validity

Differential Item Functioning (DIF) was tested to determine if specific groups of respondents, or person classes, scored better than other respondents, helping to examine if one group is biased over another based on the items asked (Linacre, n.d.a). DIF is generally described as the change in item difficulty for persons rather than a change in a person's abilities (Linacre, 2018). Sample size greatly affects DIF; a minimum of 30 for each group is recommended, and false positives are common (Linacre, 2018). For this analysis, DIF was determined using gender as a person class using Table 30.1, which assumes that each piloted item has the same difficulty for a majority reference group and the remaining focal groups. DIF size in logits and the Mantal chi-square test for polytomous data were used to determine if DIF was significant ($p<.05$).

Significant DIF was detected for career attitudes item I, “Make connections with students interested in similar careers” (Cisgender men: $p =.0474$; Cisgender women: $p=.0474$). Further examination showed DIF contrasts in opposing directions with DIF contrasts for cisgender men

and cisgender women at 2.05 and -2.05 logits, respectively (Hambleton, 2006). However, as each of the classifications does not have a minimum of 30 samples, the analysis is likely influenced by variances within the data (Linacre, n.d.a). A Bonferroni correction was done to adjust for the familywise error rate. This was appropriate as multiple tests were done in this analysis. The adjusted significance level is .01. With the Bonferroni corrected alpha, DIF was no longer significant for career attitudes item I.

Step 5: External Aspect of Validity

To determine external validity, Table 1.7 in Winsteps, a person-item map with Andrich thresholds was examined to determine item distribution along the scale. Andrich thresholds denote the point of probability in which a participant could get one of two scores, depending on the item's difficulty and the participant's ability (Andrich, 2011). Those students with the greatest ability are at the top of the map, while those with lower ability are at the bottom. Items are similarly distributed, with the hardest at the top and the easiest at the bottom. Figure 3.4 shows that the participants were somewhat evenly distributed along the Wright map, with more people in the middle. The person-map shows that items H - K align well with the participant distribution, with most participants at the mean and 0. However, there are ceiling effects, demonstrating a need to add new, harder items to measure changes in student abilities more accurately.

Figure 3.4.

Person Wright Map with Andrich Thresholds

MEASURE	PERSON	- MAP	*- ITEM	Andrich thresholds	
		<more>|< rare>			
18	###########	+			
17	.	+		Know how .5	
				Network s .5	
16		+			
15		+			
14		+			
13		+			
12		+			
11	.###	T+		Explore n .5	
				Make conn .5	
10		+			
9		+			
8		+			
7		+			
6		+T		Network s .4	
5		S+		Know how .4	
4		+			
3		+S			
2		+			
1		+			
0	######	+M			
-1	.###########	M+		Network s .3	Explore n .4
				Make conn .4	
-2	.#	+		Know how .3	
-3		+S			
-4		+			
-5		+			
-6		+T			
-7	.#	S+			
-8	###	+	Network s .2	Explore n .3	
				Make conn .3	
-9		+	Know how .2		
-10		+			
-11		+			
-12		+			
-13		T+			
-14		+			
-15	##	+	Explore n .2		
			Make conn .2		
		<less>|<freq>			

EACH "#" IS 2: EACH "." IS 1

Discussion

Limitations

There are limitations that should also be addressed in the current study. While the ACREO survey is generalizable and multi-institutional, one limitation of the current study is that the responses to the piloted items are limited to one university's undergraduate students. The findings can only be inferred with students from similar institutions. The other limitation of this study is the inability to do cognitive interviewing or expert review of the piloted survey items before testing. This was due to time limitations, such as training interviewers to conduct think-aloud interviews (Presser et al., 2004). These limitations should be considered when using these findings to inform scale development, program functions, and improvements to the student experience during and after college.

Implications

The initial rotated exploratory factor analysis shows that the items measured three different latent constructs rather than the intended singular construct. The piloted items asked questions about building skills and knowledge that are significant in career attitudes. These items are also related to activities that help to build complex concepts like reflection, self-efficacy, agency, and self-authorship. Considering the predominantly freshman demographic in the sample (N=176 of 229), it is important to acknowledge the potential impact of age, developmental stage, and exposure to career opportunities on the ability to respond to items that relate to these complex concepts. Overall, freshman students tend to respond to ACREO more frequently than older students, with 3,188 freshman respondents out of a total of 7,170 respondents from the 2019, 2021, 2022, and 2023 administrations (Dahl, 2023). This is not unexpected as the intended respondents of ACREO are students living on their respective campuses.

As freshmen, many of these students are just entering Kegan's (1982) interpersonal stage, which allows them to begin widening the influences that impact their self-identity as they mature. These students focus more on identities framed by the influence of authorities rather than building a sense of self-identity built from their own beliefs and experiences (Barber et al., 2013). These complex concepts, like agency and self-authorship, result from meaning-making, which these students are just beginning to understand in the interpersonal stage of development. Additionally, research has shown that most undergraduate students do not demonstrate self-authorship before graduation (Barber et al., 2013). An exception to this is the development of students from marginalized populations, who tend to demonstrate self-authorship earlier than those students from non-marginalized groups (see Pizzolato, 2003 & Torres and Hernandez, 2007). The interpersonal stage emphasizes active participation in relationships yet also entails asserting independence (Kegan, 1982). At this point in the student's education, they may not have had adequate experience to really apply the concepts the questions were referring to in their own experiences. Additionally, these students may not have had a real opportunity to participate in meaning-making experiences related to career attitudes, leading them to self-report responses inaccurately. Tailoring questions to address younger respondents' unique challenges and aspirations, such as their expectations versus realities regarding internships, could provide deeper insights.

Future administrations could focus on recruiting a more varied demographic of students to help better understand how students at different points in their programs report their career attitudes. These administrations could also focus on a better understanding of how students from various demographic groups respond to the items. To refine the survey's effectiveness and add harder items, it is important to introduce items dedicated to gathering insights on networking and

exploration, including internships and career experiences. Furthermore, the items should emphasize inquiries regarding the quality and relevance of these professional experiences, such as internships or other high-impact practices, like mentoring. This may involve exploring the level of mentorship received, the skills acquired, and how these experiences align with academic goals. By adjusting the survey to incorporate these considerations, researchers can obtain a more nuanced understanding of the impact of networking and exploration on college freshmen's career attitudes.

While items H-K performed well collectively more items are needed to better measure participant abilities. Cognitive interviewing is a recommendation prior to testing new items. Item examination by a larger group of individuals would create an opportunity to understand better how the items could be reworded to ensure that they address career attitudes. This would help to make sure that the items are unidimensional. Improving item distribution along the tool would result in better measurement of student abilities (Boone & Noltemeyer, 2017). The addition of harder items would also open new possibilities for future research. Further studies could focus on running a pilot with graduate student participants to help understand how those students perceive their career attitudes and identity growth as they continue their education.

Conclusion

Measuring latent constructs, such as career attitudes, gives researchers and practitioners a greater understanding of an abstract phenomenon. By gathering this knowledge, students can be provided opportunities that more accurately represent their experiences and growth needs. Supporting students in fostering connections between education and school can also help students shift from the imperial to interpersonal and institutional stages of Kegan's framework. This time frame poses an opportunity to learn about one's career likes and dislikes, away from

the relationships established during the imperial stage (Kegan, 1982). Understanding how students use curricular and co-curricular experiences to build career attitudes builds a starting point to help explore how this construct changes as students move into their professional lives.

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CHAPTER 4: WELCOME TO A NEW PLANET CALLED DOCTORAL RESEARCH: THE IMPACT OF WONDER PEDAGOGY ON CAREER ATTITUDES

Students can experience both extraordinary accomplishments and significant turmoil during their doctoral studies. A common discussion on college campuses in the U.S. is the issue of undergraduate attrition, with administrators, faculty, and staff implementing programs to help students persist. Higher education institutions conferred approximately 197,400 doctoral degrees in the United States in 2021-2022 (National Center for Education Statistics, n.d.). Attrition rates for doctorates are consistently high, but programming solutions are rare. For some time, U.S. doctoral attrition rates have been estimated to be between 40% to 70% and have been steady for almost 50 years (see Litalien & Guay, 2015; Zahl, 2015; Gardner & Gopaul, 2012; Terrell, 2016). These statistics demonstrate that an issue does exist within the system doctoral students learn and work in. For those who are not successful, questions remain about how they make decisions about their career trajectories.

Doctoral students' backgrounds, values, career trajectories, and desires to seek an advanced degree impact their interactions with classmates and faculty. While not the focus of this research, this paper would be remiss if it did not address the current gamut, which is the ultra-competitive nature of academic positions and the influence of doctoral program experiences on career choice. The issue of over-saturation of post-doctoral graduates vying for a limited number of academic roles is prevalent in both the United States and the rest of the world. Much of the research of the past 20 years focuses on countries outside of the United States. However, more research is needed to understand how doctoral students' career attitudes are impacted by their programs. This research examines how wonder pedagogy impacts doctoral student identity regarding career attitudes and persistence in the doctoral journey.

Identity, Career, & the Doctoral Journey

Significant differences exist in how students experience their doctoral journeys depending on their chosen study area. These differences have impacted how students view potential career pathways throughout their programs for decades. For example, Zebelman and Olswang (1989) found that students seeking a Nursing PhD were more likely to switch from the desire to pursue a faculty position into roles such as consulting one year after beginning their doctoral program compared to students working toward an Education Doctorate or a professional Doctorate of Nursing degree. This was due to a variety of reasons including a desire to do research, perceived workload, and family commitments. Additionally, institutional and life barriers can influence a student's ability to persist to graduation when considering demographic and pre-collegiate characteristics such as gender, race, and ethnicity (see Rost & Krahenbuhl, 2023). Students whose parents obtained a college degree are significantly more likely to enroll in a doctoral program than students whose parents have no college education (Mullen et al., 2003). Mirick and Wladkowski (2020) found that the availability of program support, such as funding to attend child-friendly conferences, could improve a mother's persistence to graduation. Regardless of degree chosen, the availability of various forms of support helps doctoral students persist, while lack of support in overcoming challenges can lead to attrition.

Perception of competency is one of the most significant predictors of doctoral student persistence (Litalien & Guay, 2015). A student's belief in their ability to persist to graduation can be influenced by many factors, such as faculty relationships and community (see Lively, 2022). Hoskins and Goldberg (2011) found that student-program matches between student expectations and program realities and social-personal matches, or connections with faculty and peers, significantly impacted whether students in counselor education doctoral programs discontinued

their studies. According to Holbrook et al. (2014), doctoral work without these connections can lead to students feeling overwhelmed, lonely, and "on their own" (p. 337). Even more, these pieces of the doctoral journey influence career attitudes. Horta (2018) found that, in China, doctoral students' self-perception of skills was strongly associated with career choice following graduation. Authoring identities were influenced by program connections and experiences while moving through their doctoral programs, which then impacted students' career choices after graduation.

An atmosphere of competition, unrealistic expectations, and overwork limit the ability of students, staff, and faculty to participate in environments that exacerbate feelings of inadequacy, leading to imposter syndrome (Parkman, 2016). Imposter syndrome, first coined as imposter phenomenon by Clance and Imes (1978), affects graduate students differently. Imposter syndrome, or imposter phenomenon, "describes high-achieving individuals who, despite their objective successes, fail to internalize their accomplishments and have persistent self-doubt or fear of being exposed as a fraud or imposter" (Bravata et al., 2019, p.1252). Cohen & McConnell (2019) found that doctoral students self-reported more significant levels of imposter syndrome than students in master's programs. Additionally, imposter syndrome has also been linked to greater levels of depression and other mental health concerns in doctoral students, affecting drop-out levels (Sverdlik et al., 2020).

Studies have found that imposter syndrome does vary significantly between areas of study, with students in the humanities and fine arts self-reporting higher levels of imposter syndrome than their peers (Cohen & McConnell, 2019). In this same study, imposter syndrome was reported across all areas of higher education, demonstrating that a more significant issue is at play when considering doctoral attrition. While imposter syndrome affects individuals, it is the

systems and cultures in which humans operate that perpetuate such feelings of inadequacy, in schooling and in the workplace. Marginalized individuals, particularly women, are seen as suffering from imposter syndrome more frequently than their white, male counterparts. Imposter syndrome is a by-product of long-standing cultural norms and biases created by a society that normalized the actions of white males while degrading the skills and actions of women, particularly women of color, who gain power in such spaces (see Tulshyan & Burey, 2021). Addressing and changing such systems, both in higher education and in the workplace, helps lessen the biases that are prevalent in creating spaces where imposter syndrome is happening.

Integrating social belonging into the doctoral experience is one way to help students feel connected with their program. Rost & Krahenbuhl (2023) found that combining directed Zoom meetings, mentorship, and interactive group activity embedded in coursework positively impacted the persistence of Education Doctoral Program (EdP) students enrolled in an online doctoral program. The exercises of many doctoral students are isolating in nature, especially those students who also have other competing responsibilities. The pervasive competition and power dynamics push students to see each other and faculty as adversaries, stymying hope for love, connection, and community building in the graduate-level classroom (hooks, 2003).

Research on factors contributing to improved doctoral persistence has recommended integrating community-building activities into the traditional doctoral study environment. Going beyond traditional systems to build community in doctoral programs has been shown to positively affect doctoral student well-being and quality of work. The intention is that such activities help lower the effects of imposter syndrome on student well-being. While anxiety does reflect a desire to do well in one's program, there is a need to combine it with various support systems to help build hope. The inclusion of community-building promotes a connection

between peers, alums, and faculty. Integration of relationship-building activities, such as writing groups, helps students create a platform for asking one another questions while also supporting successes and struggles (Wilson & Cutri, 2019). The available support also affects persistence, with mentorship and lower perceived competition among students noted as lowering feelings of imposter syndrome (Cohen & McConnell, 2019). Integrating community and belonging into the doctoral experience exposes graduate students to the fact that all professionals feel inadequacy and fear failure at some point in their conversations, normalizing their experience (Blake-Hedges, 2018). These connections help to guide self-reflection and growth while also providing a support system to help persist to graduation.

Wonder Pedagogy, Imposter Syndrome, and Doctoral Students

Wonder pedagogy encourages individual and collaborative activities involving critical thinking and creativity. The practice of wondering about ourselves and those around us grounds wonder in acts of empathy and critical reflection. Wondering evokes the possibility of approaching other people, places, and things with compassion and a willingness to look beyond initial assumptions and beliefs (Kearns, 2015). Wonder pedagogy has the potential to help increase the critical reflection necessary to connect with other students through activities like mentoring and building those support systems, and, ultimately, positively influencing attrition. Gilbert and Byers (2017) found that when used with adult science learners, wonder pedagogy helped promote a connection between the natural world and the desire to learn more about the topics they were learning. Gilbert and Byers (2017) also found that wonder pedagogy helped increase interest in students' research agendas while demonstrating that there is no right way to undertake science. Even more significant was the role of question asking between the teachers and their students within elementary students' science classrooms, which positively impacted

building community in a class elementary students may feel uncomfortable in (Gilbert & Byers, 2017). Feeling more comfortable and confident in their roles as science teachers made them feel more connected to science. This comfortability influenced their willingness to take risks in the classroom, such as allowing students to focus on problem-solving rather than memorization, demonstrating a positive effect on imposter syndrome.

In today's world, wonder provides opportunities to explore, question, play and learn without fearing judgment or being wrong (Schinkle, 2017). The process of wondering leads to pushing the boundaries of what one currently knows. However, a singular definition for wonder would not do justice to the process of wondering, and scholars researching wonder have not agreed on a singular definition. Schinkle defined two types of wondering, active, which "involves a drive to explore and a desire to know or understand the why or how of something…" In contrast, in deep wonder, "we sense the utter mysteriousness of what it is we are contemplating" (Schinkle, 2017, p. 543-544). Schinkle's notion of mysteriousness compels us to recognize significant mysteries that may never be explored.

The orientation taken by this project is that wondering is an active, ingrained process that is a part of our everyday lives, whether we recognize it or not. According to Byers (2022), "Wondering in this orientation, then, becomes understood as the attunement to and with this relational emerging ecology that is always and already ongoing in the world, and is the felt process of one's belonging and becoming with/in it" (p. 59). This orientation addresses the presence of wonder in our everyday lives, whether we are actively wondering or not. Contributing to the work of previous scholars, Byers also examines the many facets of wonder and what it may or may not be. Byers found that preservice elementary education teachers in their first semester of graduate study who had experienced wonder pedagogy themselves and

then implemented wonder pedagogy in their classrooms "expressed feeling more aware (of wondering), more open, more confident, more capable, and more in tune with nature, science, and themselves." (2022, p. 111). In many contexts, education does not promote the concept of wondering within the classroom environment. Gilbert and Byers (2017) explain that wonder "drives the desire to know more, the courage to enter into the unknown and work toward deeper understanding" (p. 910). This desire to be inquisitive is lacking in current educational practices. Elementary and higher education focuses on the traditional "banking system of education," where priority is placed on the memorization of content to be dispensed by the teacher and deposited into students' minds (Freire, 2018). This system leaves little room for excitement or passion for developing. The same system does not always allow for the flexibility for students to wonder about interests and ideas that do not align with traditional classroom instruction, alienating those students from their environments and increasing attrition.

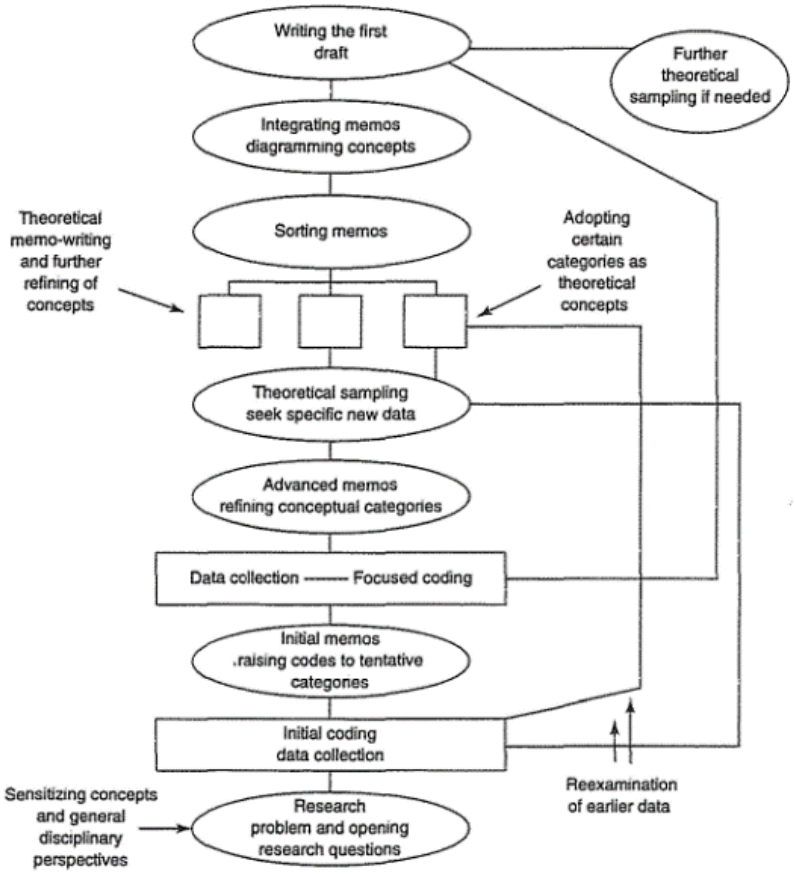
Grounded Theory

Previous research and anecdotal findings support the use of constructivist grounded theory in this proposed study and this researcher's lived experience. Research into wonder pedagogy is a relatively new field of research, especially when connecting wonder pedagogy with career attitudes. Currently, there is no fully articulated framework focusing on wonder pedagogy. Charmaz's (2006) constructivist grounded theory provides a flexible method used when little is known about a phenomenon. Its main goal is to develop an explanatory theory by directly deriving it from the data, ensuring a strong link between theory and empirical observations in the studied area (see Chun et al., 2019). While various camps exist concerning the approach researchers should take when using grounded theory, Charmaz's (2006) theoretical underpinnings encourage researchers to acknowledge their biases, such as language and

background, impacting research processes (see Figure 4.1). This work aims to move toward creating a theory that explores how wonder pedagogy influences career attitudes and fosters a greater sense of connection to doctoral identity, pointing to constructivist grounded theory as the appropriate methodology over other options, such as phenomenology or ethnography.

Figure 4.1.

Grounded Theory Framework



Note. Charmaz, K. (2006). *Constructing Grounded Theory: A Practical Guide through Qualitative Analysis.* Sage Publications LTD.

Charmaz's (2006) constructivist grounded theory process recommends a preliminary literature review to build a foundation and situate oneself within the field. Through the literature review, the researcher should understand how their work will add to the field without stifling

creativity (El Hussein et al., 2017). As data are gathered and analyzed, the literature is revisited to understand emerging concepts (Charmaz, 2014). For these reasons, a more extensive literature review was conducted throughout the research process as significant concepts and themes emerged from the data. Literature then became part of the data and research process.

As an interactive process, gathered data is compared against itself, allowing important topics and themes to present themselves through the participants' storytelling (Mills et al., 2006). Coding focuses on processes and actions grounded in the data, with codes emerging and potentially shifting throughout the analysis. In other words, how one interprets the data leads to why, how, and what is happening throughout the participants' lived experiences (Charmaz, 2006). The researcher questions what factors may be impacting or influencing the processes undertaken by the participants to theorize more significant phenomena (Strauss & Corbin, 1994). Line-by-line textual analysis was used for the reflection papers and the participant interview data.

The grounded theory process is particularly suited to the experiences of doctoral students experiencing shifting identities within their first semester of doctoral study. This study uses Gee's four ways to view identity: nature-identity, institution-identity, discourse-identity, and affinity-identity (2000). All four ways to view identity coexist in our lives and exist due to Discourse, or the process in which a trait is associated with being a specific "kind of person" (Gee, 2000). Different power sources, such as educational institutions, influence these identities. Affinity-identity is an identity that occurs when one joins a group of people with whom they share experiences or interests (Gee, 2000). In enrolling for a doctoral degree, doctoral students also choose to join an affinity group of other doctoral students, even when those students are separated by time and geographic location. While joining an affinity group was not an intention

of mine when I began my doctoral journey, I did find myself in a supportive affinity group. The affinity group I joined grew to include other cohort members. Those relationships helped to strengthen my commitment to my identity as a doctoral student.

The reflection assignments utilized for part one this study help to demonstrate how each student's identities influenced their thoughts and actions throughout the course. When researching identity in a setting such as this, reflection, memory, emotion, and knowledge were all present in the data. Grounding oneself in the data is also imperative when utilizing reflection assignments, a written form of memory, and the emotions of those experiences. Grounding allowed for the data analysis to focus on the rich experiences of the participants (Charmaz, 2006). In grounded theory, students bring to the surface the impact of their experiences and their perspectives on how their various identities may or may not have shifted through their own words.

This research used data analysis to build a social practice theory of identity that helps explain doctoral students' experiences in an education doctorate program. Social practice theory (see Holland & Leander, 2001) focuses on the productive society processes that build various identities through lamination. According to Holland and Leander (2001), lamination "allows for the continuing heterogeneity of materials. Characteristics of the original components can remain," leaving pieces of former identities and backgrounds, such as feelings, memories, and much more. The researcher gathers participants' background information during the interview to help the researcher "enter the research participant's world" (Charmaz, 2006, p. 19). Conducting intensive interviewing through a semi-structured interviewing protocol better examines significant experiences and lasting impacts. Follow-up questions probing the participants' responses regarding the application of wonder in the classroom and their actions, reflections,

experiences, and thoughts were used throughout the interview to help better uncover participants' connections to their career attitudes through the impact of wonder as a pedagogical tool (Charmaz & Belgrave, 2012). Such a theory, using the participants' own words, could assist in identifying the role of wonder in doctoral students' career attitudes and program persistence.

While recognizing that bias cannot be removed entirely from the research process, bracketing my experience, emotions, and biases before the interview process and re-evaluating as the process continued helped to analyze the data accurately. I have connections to the population I studied. I have probably been a student in the same courses as some participants doing the same wonder assignments. It is also probable that I worked at the same institution as some participants. I may know the participants reasonably well. My experience and relationships give a unique insight into the process each of these students experienced and influence how I view the process of wonder in the classroom. Bracketing, a process first connected with phenomenology, has become a tool within many methodologies in qualitative research. In the grounded theory approach, bracketing is a process visited throughout the research process (see Tufford & Newman, 2012). Through memoing, I identified how my background, beliefs, emotions, and experiences impacted how I view participant experiences. This consistent self-reflection helped me to stay as grounded in the data as possible.

Positionality

My experience as a doctoral student and a full-time Academic and Career Advisor at the institution impacts how I see the doctoral experience impacting identity development as a scholar. I spent much of my time in my twenties exploring jobs, schooling, and life. I had no idea what to do with myself. I could not find the path that would allow me to be myself while providing opportunities for career growth. My career struggles led me to become an adult learner

in my thirties, seeking a doctoral degree while working full-time. While I wanted to experience everything a doctoral program offered, I knew I could not participate in everything. Despite that, I was still in a position of privilege. Nevertheless, I was still willing to put myself out there and try but sometimes questioned my ability to do my best and complete the degree.

My experience throughout my program pushed me to recognize that my feelings of being an imposter were unfounded. For me, wondering assisted in building relationships with other students, who I realized were wondering about topics and problems that they thought were silly, just like me. Wonder helped play a role in pushing me to be vulnerable in and out of the classroom. I discovered that actively wondering can help me to improve my confidence and increase my connections with other students. Wondering created the pathway to the recognition that I was a scholar, even though I did not think I looked like what is viewed as the traditional scholar. Actively wondering allowed me to feel safe, acknowledging that I could be, and now am, a researcher. I also believe that wonder pedagogy created the desire to question the world around me, especially in my career. Following the course, I recognized this undeniable urge to question why things were done the way they were and put myself forward to help make change at my institution. Eventually, I became disappointed in the way that my potential contributions were stymied by those whom I felt could benefit from some of the knowledge I was gaining in my courses and doctoral experiences. All of this led to my eventual departure, at least partially, from higher education.

As a researcher and a scholar, I also have beliefs about how I hope students are experiencing the beginning of their doctoral journey. Other factors also influence my identities. As a white, middle-class, heterosexual female, my experiences of higher education and life have not been difficult. I will never experience some barriers to success as my classmates. Because of

my privilege, I will never be able to truly understand the work it takes to overcome some of the obstacles my classmates will experience.

As a student in the same doctoral program I intend to study, I am close to the research I am undertaking. I completed the reflection assignment I am analyzing as part of this research. The analysis did not include my reflection paper. My interests in identity, persistence, imposter syndrome, and wonder all influence how I gather, understand, and analyze data. This project is also not the only research I am currently a part of relating to wonder. The concepts of permission to play, self-determination, and vulnerability emerged from another wonder research study currently in progress. Permission to play refers to the action of students participating in activities, such as research and conference poster presentations, which help students build their own scholarly identity. This research influenced my initial understanding of wonder pedagogy in foundational doctoral study courses.

Methods

This research aims to examine the impact of wonder pedagogy on doctoral students' career identity development through qualitative research interviewing and textual analysis utilizing grounded theory. Education doctoral students who completed a course with wonder as a pedagogical tool as part of their course curriculum were the intended participants in this study. Two types of data were analyzed. A preliminary textual analysis of reflection assignments was done to inform the interview process. Following data collection, the reflection papers and interview transcripts were compared against one another to understand similarities and differences in participants' experiences. Additionally, the impact of those experiences on career attitudes over time was analyzed.

Data Sources

I used purposive sampling to recruit participants within one education doctoral program in which wonder pedagogy was used. This sampling process helps to determine participants by including those who have shared similar experiences, values, or other characteristics to obtain information-rich data for in-depth analysis (see Patton, 2002). Following the tradition of grounded theory, purposive sampling encourages recruiting individuals with experiences connected to the initial research interest. Purposive sampling differs from theoretical sampling in that the participants for this study were recruited before data collection rather than during the analysis process (Charmaz, 2006).

The criteria for selection for recruitment in the study include currently enrolled, previously enrolled, or graduated from an Education Doctorate program. All participants attend or attended courses as part of a doctoral program at a public 4-year university in the United States. The participants vary by program format, age, background, professional career, and intention to seek out further study. For example, while each student took the same course, some attended in person, while others attended synchronously. Some students worked full-time, while others were full-time; some had families, and others did not. Additionally, most were adult learners. While each cohort may have experienced wonder as a pedagogical tool in the classroom differently, gathering and analyzing data through reflection provides the opportunity to understand the impact of wonder pedagogy on a specific population. One factor to note is that a larger number of students identifying as female enrolled in the doctoral program than male students. However, this enrollment disparity is common in education doctoral programs. For example, the National Center for Science and Engineering Statistics Survey of Earned Doctorates (2021) found that 70.8% of females and 29.1% of males earned research education

doctoral degrees that year. In 2021, women also accounted for 56.8% of the first-time enrollment in U.S. doctoral programs, demonstrating a continuing trend (Zhou, 2021).

A recruitment email was sent in October 2022 following IRB approval (see Appendix B) to all education doctoral students who had completed a reflection assignment for a course that integrated wonder as a pedagogical tool. The email included a Qualtrics link to a recruitment form. The form was available for four weeks. This form included informed consent. Participants submitted their reflection assignments and provided contact information for a follow-up interview. All participants either chose a pseudonym or had one assigned to them. Eight reflection assignments submitted from eight participants were used as preliminary data to inform the interview protocol utilized in the interviews. The primary purpose of this reflection assignment was not to address how wonder influenced identity and connection. Instead, the students in each year, except for 2017, were assigned an open reflection about their experience throughout the course. The 2017 cohort course wrote an open reflection that also required the addition of each student's wonderments from their wonder assignment. The assignments provided a platform for understanding the holistic experience and impact of the course on doctoral students. The reflections were submitted toward the end of the course, meaning that the students' recognition of their identity and how it may or may not have shifted over the course was fresh in their minds. All reflection papers and video recordings submitted were part of the preliminary analysis. The data was first de-identified. The initial coding analysis was completed to help inform the modified interviewing protocol for the semi-structured interviews.

Nine semi-structured participant interviews were conducted in the Fall of 2023. All participants chose a pseudonym. If the participant had also submitted a reflection paper for analysis, their chosen pseudonym was different from the pseudonym associated with the

reflection paper. All interviews took approximately 45 minutes and were transcribed by Rev.com. An initial interview protocol, modified for this study, was developed for a previous study examining wonder pedagogy. The preliminary data findings from the reflection assignment analysis informed the initial interviewing protocol changes. Specifically, I added questions to focus on the impact of exploration, wonder, and community on participants' identity development, especially relating to career, during and after course completion (see Appendix B). As the interviews progressed, additional questions were added to help dive deeper into how community influenced career identity during their time in the program.

Data Analysis

As grounded theory is an iterative process, data collection shifted as new data was gathered and analyzed. Continual comparison between the data and new, emerging codes refined the categories in the final coding process as additional data was gathered throughout interviews. Previous and new interviewing transcripts and reflection papers were examined to guide modifications to the interview protocol, understand emerging codes and categories, and determine if saturation has been reached. Saturation is reached once new codes, theories, and relationships no longer emerge from continually comparing the participants' experiences (Charmaz & Thornberg, 2021).

The data collected provided insight into significant concepts and themes in the lived experiences of education doctoral students. After conducting line-by-line analysis in the first-round initial coding exercises, several codes emerged prominently. Multiple concepts emerged from the reflection paper's second-round axial coding processes, including research as a process, community, acceptance, confidence, vulnerability, exploration, and identity. The preliminary codes from the analysis of the reflection papers were further refined throughout the interview

coding process. Regarding values coding, participants consistently reflected on ideas such as creativity, willingness to try, dedication to scholarly growth, questioning, fear, and meaningful contributions to the cohort. While values coding is not a typical step within grounded theory, the influence of value systems on adult learners is essential to examine, especially in the context of career attitudes.

Findings

As doctoral students, the participants each experienced imposter syndrome in their own unique ways. A common thread was the consistent act of comparing themselves to their peers, a common source of imposter syndrome in graduate students (Blake-Hedges, 2018). For many, their professional working years had been filled with job responsibilities, family, and other things that left little space for questioning or wonder. In fact, prior to being re-introduced wonder during a course that integrated wonder as a pedagogical tool, wonder was not a process that any of the participants had participated in within their recent memory. The project provided a jumping point for taking the time to question and wonder again, a trend that continued throughout their doctoral programs. Wonder, according to previous research by Gilbert (2013), can create a space for graduate students to ask more questions and identify topics they are passionate about. More specifically, they began wondering about ideas or topics they had left behind to make space for adult responsibilities.

For some, wondering pushed them to identify new areas of interest to explore, but these new interests did not always align with their current careers. The doctoral program and the course where they were introduced to wonder served as a holding environment. A holding environment integrates its participants, accepting us as who we are while creating space to grow out of (see Kegan, 1982). The students' holding environment provided the space needed to

consider new ideas. Dolly remembered feeling confused when their supervisor questioned why they were wondering about a wide range of ideas, rather than wondering about topics more closely related to their job. They remembered, “I was sharing them with my corporate supervisor. We [were] more focused on prevention and treatment in an acute care psychiatric facility. It struck them funny or odd that I wasn't looking at wonderments about treatment in that level of care.” There was a true disconnect between their interests and their employer's mission. They began to recognize that their own desires and thoughts were separate from the expectations of those around them, including their supervisor.

Reflecting on Kegan’s developmental stages, Dolly demonstrated moving from the socialized mind to the self-authoring mind and, finally, the self-transforming mind. To protect their anonymity, their words here are paraphrased. They recognized the risk they were taking in changing careers at this point in their life and doctoral program. Dolly recognized that if they wanted to have a greater impact on the wider world, it was up to them to take the steps to move into a role that allowed them to do so. For Dolly, this was a turning point in their thoughts regarding their true passions, and they began questioning why they were in the role they were. They began focusing on finding a role that would allow them to fulfill their desire to impact others positively. More specifically, they recognized their ability to impact youth through curriculum and, in turn, the lasting impact that could be made on the world. However, the shift to self-authorship and then self-transformation did not happen without the influence of several different factors. The shift, seen in several participants, resulted from factors such as recognizing imposter syndrome, the wonder project, and building community within their doctoral program.

Wonder Pedagogy & Reframing Imposter Syndrome

Participants felt like imposters at the beginning of their programs due to being new to the field they were studying. The participants described feeling inadequate when comparing themselves to peers whom they thought were smarter, more prepared, or in more prominent career roles than themselves. These feelings of inadequacy manifested in a disconnect between themselves and the wonder project they were asked to complete. Before the wonder project, many of the participants had never considered the view that being a researcher and undertaking research was achievable. Several remembered being vehemently against doing research based on previous experiences. These findings echo previous research by Gilbert (2013), which showed that the influence of previous negative experiences tainted graduate students' interests in specific areas of their field.

The concern of doing something wrong was prominent in several participants' memories. The pressure of others' expectations weighed heavily on them, signifying that at the beginning of their programs, the participants were straddling Kegan's (1982) interpersonal and institutional stages. The doctoral program served as a holding environment, providing a space for participant acceptance while embracing change and growth (Saunders, 2017). For Lisa, whose work focuses on student affairs, they consistently worried that someone would call them out for doing a PhD, rather than an EDD. They remembered, "I felt like an imposter in a lot of ways because it's just like somebody's going to wake up one day and look at you and be like, 'Why don't you just do the damn EDD? Why are you here?'" The wonder project helped them to move beyond their fear and pushed them to explore areas of interest they had disregarded. Wondering, as a pedagogical tool, helps students to work through the "strange, confusing, and amazing things students might be noticing without worries of being 'correct' or trying to know the answer before the

investigations begin." (Gilbert & Byers, 2017, p. 915) The process of wondering elicits emotions, both positive and negative (van de Goor, J et al., 2020). Emotions are an integral part of recognizing and moving away from imposter syndrome. For Lisa, the process of designing their wonder poster was the pivotal moment where they felt the shift away from imposter syndrome to truly believing they could positively contribute to student success through research. As they were designing their poster, they realized that research was a way for them to use their creativity and love of design. While choosing colors and arrangements for their poster, they felt themselves move from vulnerability and fear to excitement and anxiety to share their wonderment with the program community. They described this as a spark in their journey from perceiving themselves as an imposter to focusing on actively contributing to the student affairs field.

Wonder pedagogy provided an open door to recognize that growth could still happen as an adult learner regardless of each participant's personal and professional background. Like Dolly, participants noted a shift from the institutional identity that had been placed on them by their current job roles and supervisors (Gee, 2000). Wonder can be a catalyst, disrupting current values and beliefs and leading to a shift in how individuals view meaning (van der Goor et al., 2020). Before participating in the wonder project and sometimes afterward, there was clear resistance to claiming a researcher's identity. The participants talked about being students, practitioners, parents, lecturers, administrators, and other identities as separate figures from one another. Compartmentalizing these identities echoes the doctoral students' use of 'figured worlds,' where each identity was kept separate from the others (Gee, 2000). These 'figured worlds,' influenced how participants shared their doctoral journeys with others, such as family members. Some participants noted that family served as a driver to success, while others feared

disappointing family if they were to fail at achieving their doctorate. This fear is also reflected in several participants' decision not to tell their families or other significant individuals of their pursuit of doctoral studies. This omission lasted for over eighteen months for Rachel, until they felt they had persevered enough that failing was no longer an option.

Participants described a level of persuasion from external motivators to obtain a terminal degree. Outside forces, such as supervisors and coworkers, greatly influenced participants in pursuing a doctoral degree in the first place. For others, like Rosie, it was made clear to them by supervisors that they were being "passed up for opportunities because I didn't have my doctoral degree and I was told that if I want to do more with my career there, the reality is that I need my doctoral degree." As an external motivator, this demand for career advancement can negatively affect doctoral students' program persistence (Nyunt et al., 2023). Overall, participants remembered reluctance to begin a doctoral program and the desire to pursue further education was, many times, not a driving factor to beginning the program. They saw the program as a means to career advancement rather than an introduction to possible new identities. Rachel described the first semester of doctoral work as focusing on survival, stating, "When I first started the graduate program, my role was survival. That was strictly it. And I really questioned whether I had made an error…because I felt like a fish out of water." Because their focus was on survival, their ability to widen their horizons to explore new identities and connect with other cohort members was limited in that first semester.

As doctoral students, each had preconceived notions of who they believed a scholar to be and what scholars did. There was a fear of the unknown concerning a scholarly identity. For example, Ash did not always see the role of a scholar as an option, reflecting,

> I was a little put off by the term "scholar," probably because I thought only really smart people became scholars, not normal people like me! I went through a little bit of an identity crisis, mostly because I did not know how to become a scholar.

Rachel discussed how the scholar identity, more specifically the research, made them uncomfortable but recognized it was something that could be achieved with time and experience, writing at the time, "I think the most important step to becoming a scholar is to start being a scholar. I realize that I know about a speck of information regarding educational research in the whole scheme of things. I have no business calling myself a scholar today." Despite being a college instructor and participating in academic endeavors on a daily basis, Rachel felt as though they could not connect a scholar identity with their primary practitioner identity. They felt like an imposter by attaching themselves to the scholarly identity despite their academic successes, already telling themselves at the time, "I'm not an academic. I'm not smart enough." Exposure to becoming a scholar in conjunction with the wonder project pushed them to rethink who scholars are and do. Their sense of self grew following the wonder project, turning more toward intrinsic motivators, like creativity and personal interests (Nyunt et al., 2023). In the following years, Rachel described becoming more comfortable taking on a scholarly identity but still not identifying as a researcher, still holding on strong to their practitioner roots.

Doctoral Work, Wonder Pedagogy, & a Larger Ecosystem

Through the participants' stories, it became clear that a larger ecosystem existed that integrated wonder and community. Wonder served as one piece of a larger ecosystem of support that spanned both in-person and online learning. Learning from others, such as peers and Wonder pedagogy, helped connect students with their cohort through discussions, Flip recordings, connections to other students, and presenting wonder posters to the university community.

Community was an overarching concept influenced by the classroom and connection with faculty and classmates outside the classroom. Feelings of happiness, loneliness, and fear or discomfort accompanied feelings of acceptance. Acceptance was seen in the forms of the work required for doctoral study, acceptance of one's own experiences as impactful in the doctoral journey, and acceptance of discussion and feedback from peers as helpful in growth. The participants talked about how the community was not just strictly students but also included other students, faculty, and co-workers. Faculty played a role in introducing students to the larger scholarly community through activities like research and conferences. Darla explained, "...I was in my 30s when I started. And so, my advisor never treated me like as student. He treated me like a colleague. And they all did, all of the faculty. And so, I never felt like I wasn't able to do the 'things.'" The belief that Darla's advisor had in their abilities helped them recognize their trust in themselves, even from the beginning when they felt they may not have earned that trust yet.

In one case, a student felt their relationship with the faculty grew strong enough throughout their interactions to tease them in their reflection, stating, "Too many bullet points defeat the purpose of using them in the first place. So there. I finally got that off my chest!" Collaboration and group discussion consistently present significant interactions in building confidence and lessening the burden of loneliness and imposter syndrome. Several participants acknowledged that group work provided an avenue for connection to assist in learning complex concepts. For example, one participant, Bri, explained:

> Open dialogue, critique, and small and large group work illustrated how concepts could begin one way but end in a very different pattern. Complex systems cannot be understood in terms of the parts alone- in the flight of the starling, from a distance, a pattern emerges, distorts, and emerges again.

Each participant experienced these concepts within the classroom setting amongst their peers. However, it is important to note that several of the interview participants were greatly impacted in their education and work by the COVID-19 pandemic. The COVID-19 pandemic impacted the doctoral programs of over half of the participants. The pandemic also happened concurrently with other major life events, including career moves. The shift from in-person courses to an online learning environment caused much uncertainty for participants. For Zander, COVID-19 felt like it limited their ability to connect with others in ways that were important to them. Flip, an online learning discussion board, was used before the pandemic for activities like discussions and sharing wonderments. In place of in-person discussions during the pandemic, students used Zoom to connect as a larger class and in small groups. Connecting with one another and providing an environment to be vulnerable provided an outlet for stress during the pandemic. It also created a safe space to share thoughts and ideas. Zander stated, "When you're trying to talk to computer screens and build relationships, it's hard. But then we get together over Zoom later, right, with like small groups of us…it did work out."

During and following the pandemic, the students used an online platform to present their wonder posters at a program-sponsored conference or in a Zoom-based poster session to the larger program community and campus stakeholders. The virtual setting played a big role in Zander's connecting with other scholars with similar interests. This connection with a scholar from Virginia was missing during classroom discussions via Zoom. They explained that their cohort always supported their project, asked insightful questions, and had a genuine interest in their topic. However, none had the same zeal for sports as the scholar who visited their poster presentation. The conversation helped them to realize they could do research related to topics that they were passionate about.

Self-reflection, an act leading to self-authorship, significantly impacted how the students' perspectives changed following the wonder project (see Kegan, 1982). Zoey described the process as being vulnerable in ways that meant, "You really have to look at yourself…Vulnerability was really a lot of self-reflection…It started to lead down other rabbit holes of, you know, implicit bias and you know some things that may affect the way I look at things." Almost all participants had a moment in their reflection papers and in their interviews where they switched from a more individualistic point of view to using a 'we' mindset while reflecting on their journey throughout the course and program. One participant, Bethany, described their journey as "We walk our scholarly walk, and we talk our scholarly talk. We stayed connected throughout the week using Flipgrid, sharing our ideas, our thoughts, our wonderment, our concerns." This connection throughout the first semester's journey seemed deeply intertwined with the emergence of confidence throughout the semester and the program. The sense of community in the classroom moved many participants from fear, aloneness, and vulnerability to feeling they had permission to play at scholarly endeavors. Lisa described the shift as vulnerability in that, "You have to be so open with these people who are in that space with you. It's impossible for you not to create those bonds because a lot of times, vulnerability and having those moments together is what creates community." The analysis provided a picture that followed each participant's journey from questioning what a scholar does, who a scholar is, and how the willingness to scholar by participating in research activities helped.

This positively influenced their identity development and self-belief in the ability to move forward in their program. Another participant, Cassie Rose, recognized a shift in their self-belief as the semester progressed, writing in their reflection, "Scholarship is part of my job description. However, I have never embraced that part of my role until this semester. Writing and

sharing my knowledge with others excites me again." This shift to excitement denoted a desire to explore and try to connect with research in the doctoral journey. Additionally, the Wonder Project served as a platform in which they began to develop thoughts about how they could research what they were passionate about. This was common throughout the interviews, with the wonder project serving as a springboard to realizing research could be done in many ways.

My experience with the wonder poster presentation seemed to differ significantly from that of the participants. The anxiety I felt before and during that presentation is still incredibly prominent in my memory. Anxiety and fear are just a few of the emotions that are evoked during the doctoral process. However, the participants did not recall feeling anxiety or fear before their presentations in the same way that I did. It is possible that this difference in memory recall could be due to time, that the participants are far enough removed from the experience to view it in a more positive light. In contrast, I am still very much involved with researching wonder as a pedagogical tool, causing those memories to be more at the forefront than the participants.

Impacting Identity, Development, & Career Decision-Making

Exploration emerged as a catalyst for students to recognize their biases and the impact of previous experiences, such as career, life, and schooling. In their reflection, Bonnie explained, "Before this course, my understanding of research methods was pretty much black and white and consisted mainly of quantitative, qualitative, and mixed-method study designs. As we dove into our analysis of research, it became evident that there was a whole new world of research just waiting to be explored." Bonnie realized there were no constraints on their interests and how they could learn more about them. The process of wondering can help students realize that research has many different layers that can be explored from different perspectives without limits. (Gilbert & Byers, 2017). The wonder project allowed participants to explore the passions

of other students and exposed them to new ideas, which they then used to help push themselves to consider the world around them.

The desire to set their own path despite the expectations of others and find career paths more suited to their interests signals that the participants began to self-author their futures (Kegan, 1982). For Barb, the wonder project broadened their career interests from a teaching focus to working in student affairs. The wonder project also made them realize that the community they were in as an instructor was not conducive to their learner spirit, saying,

> I began to recognize more how close-minded some people are. And that was hard for especially people who I had like looked up to as mentors, and kind of put on this pedestal, so not to speak about it in a bad way, it was just different, a different way of viewing what I was doing that I hadn't totally ever really thought about before again, because I didn't have any other experience.

Several participants noted that wonder helped them to realize how they could better approach different situations in their jobs to be more effective. Rachel acknowledged that the wonder project improved their empathy for others by asking more questions and being more considerate of the environment around them. For Betty, the wonder project pushed them to recognize that their questioning nature sometimes influenced how others interacted with their stating,

> I was always a really questioning person. I wondered a lot, but I've phrased it that [questioning] way. And I think more so, I noticed that a lot of people take questions as sometimes defiant and, maybe, disagreement versus trying to clarify or understanding. And I still see that as something that I hone in on a lot even today because I became very

aware that…And so that was a shift in recognizing that, but also then realizing that because I am a very curious person [but] then sometimes it's not perceived that way.

Changing careers during the program, despite the risks, was common. Almost all participants had moved into different careers throughout their time in the doctoral program. Those who had not made a switch were in the process of considering a career change or actively looking for new jobs. These shifts resulted from moving through the influence of imposter syndrome to self-belief and the willingness to put oneself into vulnerable positions to achieve growth. Despite participating in their department and taking on leadership roles, Rachel began to feel more comfortable disagreeing with decisions made by their department. However, the backlash from questioning their co-workers forced them into a space of questioning their competency and pushed them to consider roles at other institutions. Other participants attributed those career shifts to the positive relationships they built in their program cohorts. Zoey shifted from a teaching-based faculty career to a leadership role part-way through their program. For them, the role of their cohort stood out as a foundation for why they have been successful in their leadership role, explaining:

> I would say I wouldn't be in this position without the support of my coworkers. Like I said I was very, very hesitant, so their understanding knowing that I have a professional goal and also learning in the leadership role was very important. There's value to education in itself. And being around educators who understand that was important because there were many times when you give up a lot of your life to get this degree, you really question, is this worth it? And they were there to support me.

These switches were described using incredibly poignant memories as several were leaving the exact jobs that pushed them into the doctoral program to begin with. The shift from

focusing on the expectations of others to creating expectations for themselves resulted from growing confidence in their abilities. The holding environment that the students found themselves in provided the space to learn, create, and experience risk, all within a supportive environment. Additionally, Dolly's experience suggests that the larger ecological system at work can positively contribute to students moving from self-authorship into Kegan's final stage, self-transformation.

Conclusion

The findings point to larger implications for 'helping fields' that can provide deep fulfillment but face retainment issues, such as education and nursing. Both careers are overly represented in this sample. The findings can help to inform advisors and supervisors of the identity shifts they may see in doctoral students. This knowledge can help those in leadership roles better understand how to meaningfully integrate new knowledge into their current roles, without overstepping job descriptions and boundaries. One avenue for further research would be digging deeper into whether there is a link between doctoral program persistence and the lack of connection with scholarly/learner identity for those students who do not finish the program versus those who did finish their program. Follow-up interviews would need to be conducted to delve deeper into their comments and experiences. In relation to career attitudes, further research on the mid-program career shifts is warranted based on the findings of the participant interviews. Further interviews could uncover a deeper understanding of what else is, if anything, contributing to those shifts.

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CHAPTER 5: GENERAL CONCLUSIONS

This disquisition provides a well-rounded pool of research demonstrating the role of college experiences in building career attitudes. Building foundational beliefs in college regarding one's ability to find not just a job but a career in college is an important step that programs and institutions can support. Using Kegan's (1982) Constructive Developmental Theory as a conceptual framework, the analysis bridges curricular and co-curricular experiences, student background, and how those things influence identity development. These three articles demonstrate a deeper connection between identity, collegiate environments, and career attitudes.

Presentation of the Disquisition Research

The research presented in this dissertation focused on developing career attitudes in undergraduate and doctoral-level college students. Presented as a three-article dissertation, this disquisition provides a deeper understanding of how career attitudes are influenced by students' environments and collegiate experiences. It also has practical implications for helping inform programmatic and institutional decision-making. The articles presented here also present theoretical implications to help inform future research.

Career Attitudes: Humanizing Student Confidence Through Major-Support Systems

Chapter two uses data from the 2019, 2021, 2022, and 2023 ACREO administrations to assess the impact of major-related support systems and parental education level on the development of student career attitudes. The diverse sample includes over 7,000 students from different geographic regions across the United States. Hierarchical linear modeling shows a positive influence of major-related support systems on career attitudes. First-generation students have lower career attitudes, but the effect is considered trivial. The study explores the interplay of student parental education level, major choice, and career attitudes. Limitations include

sample representativeness and the cross-sectional nature of the study. Results emphasize the need to address support systems and major choices for better career outcomes, especially for underrepresented students. Future research could explore qualitative data and investigate how generational status impacts post-graduation outcomes, highlighting the importance of impactful practices and resources for student support.

Measuring Career Attitudes

Chapter three examines the validity of piloted items for possible inclusion into the ACREO career attitudes scale. The survey was administered in Spring 2023 to almost 5000 students at a public university in the Far West, and 229 responses were analyzed after cleaning the data. ACREO, based on Astin's framework, looks at different factors affecting student outcomes. The piloted scale also included new questions and a Vocational Identity Scale, combining different scales to check if they measured what they intended.

Methods of analysis include exploratory factor analysis and Rasch modeling to check how reliable and valid the piloted items are. The study follows Messick's framework, looking at various aspects of validity. Results show a detailed analysis of how well or not the measurements work. All piloted items were removed except for four: H, I, J, and K, which were found to be valid items that worked cohesively well together. The analysis found that more items should be piloted to help address ceiling effects found in the current person-item map to ensure thorough measurement of the career attitudes construct.

Welcome to a New Planet Called Doctoral Research: The Impact of Wonder and Reflection on Sense of Belonging

Chapter four examines the role of wonder pedagogy in the development of education doctoral students' career attitudes using qualitative analysis and grounded theory. The analysis

found two key themes that include concepts such as community, exploration, and identity. The COVID-19 pandemic affected many participants, highlighting the role of community and faculty support. Through the data, exploration is seen as a catalyst for recognizing biases and evolving scholarly identities. The study identifies a shift from individualistic to collective thinking, emphasizing community in building confidence. Two major themes, "Wonder as a Conduit to Puzzling Identity" and "Wonder as a Conduit Influencing Career Development," highlight the transformative role of the wonder project in participants' journeys. Career changes during the program are common and potentially linked to overcoming imposter syndrome. Implications for helping fields and the need for further research on doctoral program persistence and scholarly identity are noted. The study provides insights into the complex experiences of education doctoral students, contributing to a better understanding of how programs can help to build career attitudes using wonder pedagogy.

Implications

The analysis shows a deeper connection to exploration and networking in relation to career attitudes than initially hypothesized. In building identities through curricular and co-curricular experiences, students are exposed to new people, cultures, and career pathways regardless of age. The analysis presented here represents a large population of students in the interpersonal/socialized and institutional developmental stages, both at the undergraduate and graduate levels (Kegan, 1982). During these stages, connecting with peers and exploring the world around them is imperative to growth. Developing networks of informed mentors can positively influence career knowledge and development, especially when seeking new experiences for growth (McGowan et al., 2007). Participating in activities, such as mentoring or other high-impact practices, both academically and professionally, exposes students to “notions

of support, challenge, and continuity are integral to the conceptualization of the 'holding environment,' a construct that allows us to understand growth-enhancing surroundings" (McGowan et al., 2007, p.402). Lynch et al. (2022) found that by connecting students with business professional through a case competition, students were able to better align their skills with potential employers' expectations as well as seek out other opportunities for career exploration. Within holding environments that offer such activities that positively influence development, students can push boundaries that influence career trajectories through exposure to different career options.

Implications for Practice

The research discussed throughout this disquisition illustrates the significance of exploration and networking in developing college student career attitudes. Both academic confidence and major support systems were found to be significant positive predictors of career attitudes for undergraduate students. By integrating experiences that expose students of all backgrounds to potential networks and career possibilities, programs can help lessen economic divides in adulthood. However, programs must provide opportunities using the different forms of capital each student brings to campus. Additionally, these opportunities must allow students to learn about other identities they may not have known or experienced.

The findings demonstrate that fewer first-generation college students reported majoring in STEM majors than the model expected. Not all students have equal access to resources to help prepare them for college life and career afterward. This is particular true when discussing the differences between parental support in regard to major-choice for first-generation and continuing generation students, particularly in STEM fields. Jiang and Simpkins (2024) found that parent support in relation to math and science in high school did significantly positively

contribute to confidence in math and science-related areas and STEM major choices. However, the same study found that marginalized first-generation female students reported lower levels of confidence in math and sciences abilities as well as lower levels of parental support, and were less likely to choose a STEM-related major in college (Jiang & Simpkins, 2024). The ability to connect with potential career pathways can help students both economically and regarding their mental health. Pisarik et al. found that college students noted that family expectations, a desire to find meaning in a job, and a recognition of ownership over one's career were significant sources of career anxiety (2017). Career exploration and preparation, through activities like career counseling, can positively influence career anxiety in college students. Career counseling and coaching could be implemented in high school settings to boost confidence in abilities relating to college major choices. Additionally, such meetings could provide support for parents in understanding their child's career desires and connect parents to resources to help their student explore career-related experiences even both college.

The analysis shows that first-generation students reported significantly lower levels of academic confidence as well as major-related support systems. Implementing both institutional-level mentoring programs and major-related mentoring programs can provide access to peer role models, mentors, and social support. Mentors can also bridge students to major-related activities like student organizations and high-impact practices, like research opportunities. Research has shown that matching mentors and mentees based on a variety of factors, including program type and gender, can have either a positive or negative impact on mentees in research experiences. In particular, Morales et al. found that women mentees participating in a summer research experience benefitted more from having women mentors than men (2018). While still understudied, research relating to mentoring in doctoral programs also shows that these

relationships are beneficial in terms of improved motivation and intention to persist for both the peer mentor and mentee (Ayoobzadeh, 2022). Lowery et al., (2019) found that Education Doctoral students, who were also working full-time jobs and participating in a peer mentor program felt more supported and had conversations involving work-life balance and career planning.

The findings of this dissertation, as well as current research, support the implementation of wonder as a pedagogical tool in the classroom. Feelings of vulnerability often accompanied wonderment activities. Activities that pushed the students to be vulnerable helped to push them into change, both in and out of their work environments. The wonder project pushed students to explore the world around them in both serious and playful ways. Sharing those wonderments made them feel vulnerable in front of their peers and helped them realize they were not alone in their fears. The practice of exposing one's vulnerabilities and beginning to question the world around them helped them change and develop as they were exposed to different identities (Kegan & Lahey, 2001). The findings and previous research show that students, regardless of undergraduate or graduate status, can benefit from the act of wondering when implemented as a pedagogical tool.

Implications for Policy

Implementing policies encouraging networking and exploration in a supportive environment is integral to enhancing student career attitudes in any program. Institutions and programs should create policies emphasizing building supportive environments while integrating networking and career exploration. For example, required exploration courses can help expose students to various majors and careers they are unfamiliar with. One such avenue is using a mandatory major and career exploration course within the first year of undergraduate study to

help first—and continuing-generation students learn about various majors and careers available to them outside their already chosen major.

Focusing efforts on building mentoring programs can help create a comprehensive support system for students of all program types. Mentoring programs should have defined objectives, offer robust mentor training, and help connect mentors and mentees. Programs should also have appropriate evaluation and assessment plans in place to help measure impact and support positive changes to the program. Institutional support, including allocating adequate funding and helping to increase community engagement in such programs, is imperative to the program's success.

Implementing policies requiring major-related paid practicums or internships is another way to help students gain real-life experience. The analysis shows that health professions students reported higher career attitudes than their peers ($B=.206$, $p<.000$). In contrast, students in arts and humanities majors reported lower levels of career attitudes than their peers ($B=-.239$, $p<.000$). An influential factor in these differences can be attributed, in part, to accreditation and licensure requirements of specific majors. Accreditation standards for nursing degrees, and many other help professions majors require the integration of clinical practicum experience such as internships for students to graduate and obtain licensure (Commission on Collegiate Nursing Education, 2026). These experiences illustrate the reality of health professions careers in a hands-on learning setting to students who still have the chance to change majors if they so desire. Such opportunities across all majors would also help students learn whether the careers they are considering are something they want to do before graduation.

National policymakers have an opportunity to positively influence college student career attitudes by passing legislation requiring that all internships are paid internships. Current

research shows that women, Black, and Hispanic students are underrepresented in paid internships, with white, male, and continuing-generation students overrepresented in paid internships (NACE, 2024). Additionally, students who have completed paid internships, on average, have more job offers and significantly higher starting salaries than those students who do not do paid internships (NACE, 2024). Increasing underrepresented populations in paid internships will enhance participants' access, opportunities, and success, address workforce needs, and foster connections between diverse populations. Implementing a policy such as this can also benefit industry employers' hiring efforts. According to the National Association of Colleges and Employers (NACE) 2023 Internship & Co-op Survey report (Gray, 2022), employers reported offering full-time positions within the same company to 57.6% of interns in 2023. This assists companies in building a workforce of individuals with internship experience who are more likely to be retained in both the short and long term (Gatta et al., 2023).

Implications for Research

As stakeholder interest in careers for college graduates grows, there are avenues for further research that can provide additional insight into career attitudes in college students, regardless of program. One avenue of future research is conducting a longitudinal study examining how students' career attitudes shift from their first semester of college through the end of their college experience, whether that be undergraduate or graduate school. This would help inform institutional decisions on how to serve students in ways that promote exploration and networking. Surveying faculty on their perspective of how students build career attitudes could demonstrate disconnects between student realities and faculty assumptions. Using the ACREO survey with graduate students is another avenue for future research regarding better understanding how environments influence career attitudes.

The qualitative analysis of doctoral student career attitudes could be expanded in several ways. Follow-up interviews could be conducted with those participants who demonstrated desires that signaled a shift into Kegan's self-authorship and self-transformation stages. Follow-up interviews would provide an opportunity to delve deeper into each participant's career desires and how they align with those stages of development. All the students who participated in these interviews were enrolled in or graduated from the same program at the same university. Interviews with students in other doctoral programs could also provide insight into how career exploration and networking influence how they work through their programs. The interviews could create a pathway for interdisciplinary collaboration opportunities for students who may benefit from gaining knowledge outside their doctoral program. This research focuses on undergraduate and graduate students attending public universities within the United States. Further research could focus on private universities and institutions outside of the United States. Additional findings could help researchers to understand how students worldwide experience career attitudes differently. This is particularly poignant with the world being more connected than ever before.

Conclusion

This disquisition strives to bring together a comprehensive view of the role of collegiate experiences and environments in developing career attitudes. Through quantitative and qualitative studies, the research demonstrates the significant role that curricular and co-curricular experiences have on students in exploring careers and networking. It is the intent that programs and institutions can use the findings of this disquisition to make evidence-based decisions regarding the inclusion of careers into college majors. Even more, the use of pedagogy that integrates wonder can assist both undergraduate and graduate students in pushing their

boundaries and understanding what they are capable of career-wise. Through introducing the possibilities of wondering, students can recognize new career pathways, introducing them to new ways to meaningfully impact their lives and the lives of others.

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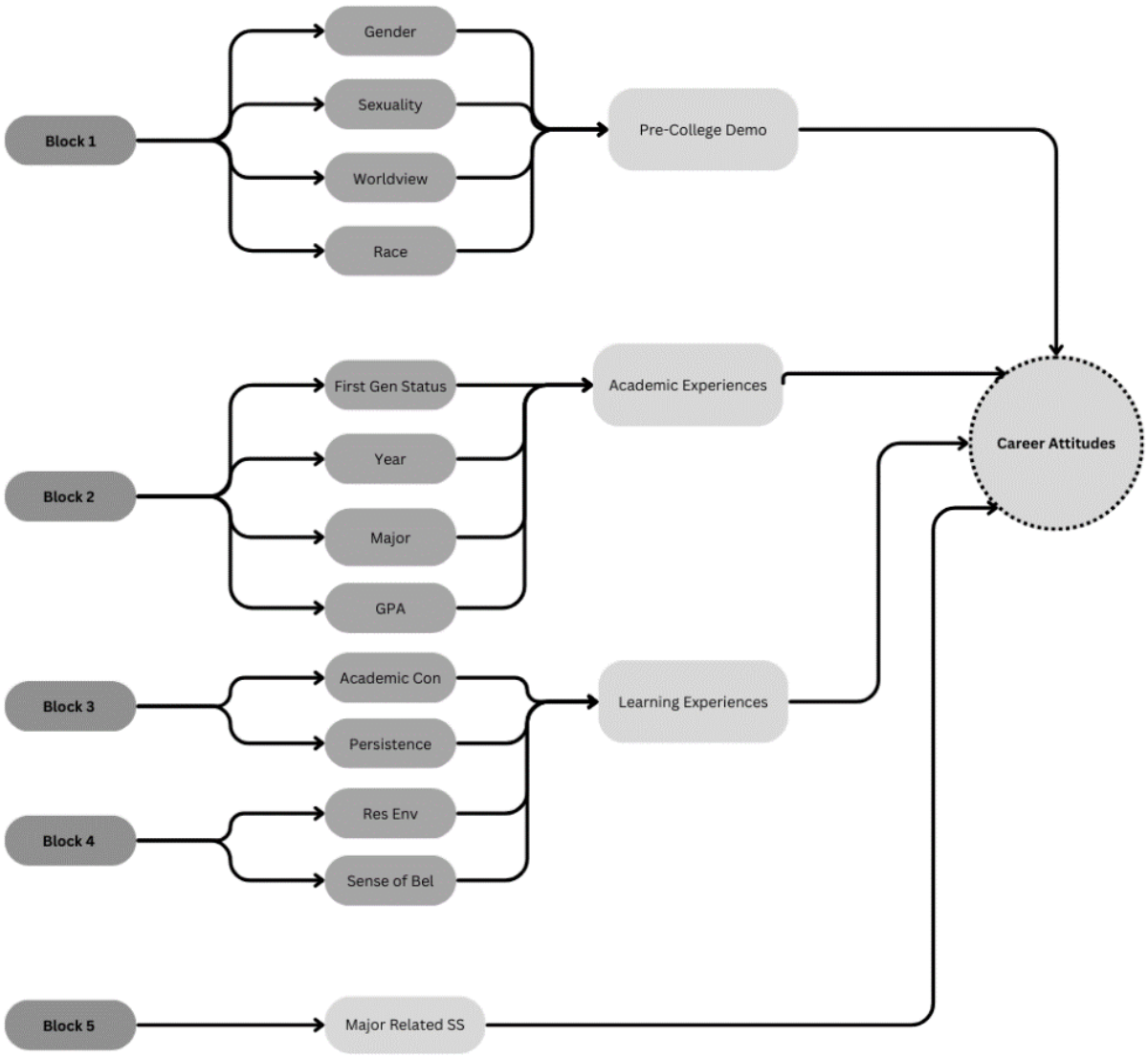
APPENDIX A: ARTICLE 1 HIERARCHICAL LINEAR MODEL



APPENDIX B: INFORMED CONSENT

You are invited to participate in a research study on wonder conducted by Cassandra Gilbert in conjunction with Dr. Nate Wood at North Dakota State University. You are being invited to participate because you were enrolled in a course taught by Dr. Nate Wood that included wonder as a pedagogical tool. We plan to investigate wonder as well as your insights on wonder that emerged from that class. This study is part of a larger research agenda being done by Dr. Nate Wood, Dr. Tara Nelson, Cassandra Gilbert, and Melissa Cournia. We believe important insights came out of those discussions and feel a responsibility to further investigate those insights and your experiences in the class – and disseminate those findings to our broader educational community.

You have the ability to participate in this study in two ways. The first process will be in the form of a **qualitative analysis of reflection papers written during a course taken with Dr. Nate Wood.** Additionally, participants in this study also **have the option to consent to be contacted to participate in a 1 hour follow-up interview via Zoom** at a time that is convenient for you. Questions in the interview will focus on your ideas about wonder as well as experiences prior, during, and after the class. The interview will be audio recorded and transcribed - and then the recording of your interview will be deleted. You have the option of providing your consent by agreeing to provide specific types of data below. If you choose not to consent, you can leave this survey at anytime by closing the browser window. You do have the option of only consenting to participate in the qualitative review of your reflection paper.

Your participation in this study is voluntary. It is unlikely that you will experience any direct benefits. In order to protect your confidentiality, a pseudonym will be used as an identifier to any data you consent for us to use. In order to minimize any risks to you, different

pseudonyms will be used in the papers and interviews and all data will be stored on a secure server. While all data will be stored electronically, de-identified hard copies may be printed for our analysis. You may choose your own pseudonym if your choose to participate and sign this consent form. In any written documents (including publications) regarding the study, only the pseudonym will be used. Only the researchers will have access to your de-identified reflection papers and interview transcripts. You can withdraw from this study at any time, for any reason, without penalty. However, please keep in mind that once your pseudonym is used in any data you provide us, we may not be able to identify it later to remove it from the data set.

If you have any questions regarding this study, please contact Dr. Nate Wood at nathan.wood@ndsu.edu, or Cassandra Gilbert at cassandra.gilbert@ndsu.edu. If you have questions about your rights as a participant in this study or to report a complaint, you may contact the Institutional Review Board at (701)-231-8995 or ndsu.irb@ndsu.edu - IRB #IRB0004501.

APPENDIX C: WONDERMENT MODIFIED DRAFT INTERVIEW GUIDE

Context: EDUC 801; beginning doctoral study; building community in the classroom & cohort; what does it mean to be a scholar and a learner

The question:

What role does wonder pedagogy play regarding doctoral student identity regarding career attitudes and persistence in the doctoral journey? (agency, self-efficacy, development, permission to play)

Introduction

Thank you for taking the time to talk with me today. As I mentioned in the email, I am working with the professor who introduced you to wonderments, Dr. Nate Wood to learn more about learners' experience of courses that incorporate wonder as a teaching tool and its' impact on career attitudes. This interview is intended to better understand your experience.

I have a list of several questions here that are mostly to remind me of the sorts of things I would like to hear your thoughts about. Some are specific to your course experiences with wonder and wonderment in relation to career, others are more general. However, it is more important for me to hear what you think than it is for me to get through my questions. So if we don't go in order – or if we don't get to all of them – that is perfectly fine. If there are things you think are important for me to know, please feel free to bring them up even if I don't ask about them. Again, what is most important is that I give you a chance to tell me about your experiences and perspective.

I don't plan to ask you about anything that I think is of a personal or sensitive nature. As you know, we have ethical responsibilities to you as a participant in the research. As a research team, we have taken several steps to try to ensure your privacy and comfort. For example, I am conducting the interviews instead of the instructor of your class, in case that allows you to be more candid. Some of these safeguards might not be totally necessary, but I am mindful of the fact that I can't fully know what sorts of things might be personal, sensitive, or uncomfortable for you as an individual. Therefore, at any point during the interview, if you would prefer not to answer any question, for any reason, please let me know and we will move on. I want to be respectful of you and your privacy.

Our discussion will likely take about 60 minutes. As we talk, you may notice me making notes, so I can remember what you tell me. However, in order to capture your thoughts as accurately and thoroughly as possible, I would like to record our conversation. Is that okay with you?

Additionally, would you like to choose your own pseudonym for this interview, a fictional name for yourself? This pseudonym will be used in any publications or presentations of our findings to protect your identity. If you elect to not use your own pseudonym, the research team will create one for you when creating the audio transcription.

Do you have any questions before I start the recording and we get started with the interview?

[start recording]

- Please tell me a bit about your background coming into doctoral study
    - What are you currently doing now?
- What do you feel was your purpose for doing a doctoral program?
    - Follow-up: Did you view yourself going into a particular field?
    - What were your thoughts on exploring opportunities, like assistantships or research, in the program to help you meet those career goals?
- What did you feel was your role in your doctoral journey?

    - How did you make decisions for advisors, coursework, etc?
- Tell me about the course where you were introduced to wonder.
- Looking back, what do you remember about that first week of class?

Wondering & Development:

- In your course with Nate, you used wonder as a lens to learn about research and what it means to be a scholar. Describe what you thought about wonder prior to the course, and how that might have changed.
- Tell me about your experience with the wonderment project - the wonderments brainstorming, poster project, and poster presentation.
    - How did you feel toward your wonderments? And what caused you to feel this way?
    - What feelings did you experience coming up with wonderments?
    - What was your reaction when you first heard the assignment (e.g., the term "wonderment")?
    - How difficult was it to come up with wonderments?
    - How did you decide on one for your poster?
    - What was it like to present your wonder poster?
- How did your classmates influence your wondering?
- How did the course impact your relationship to research?
    - What do you think contributed to this shift/change the most?
    - Say more about how (trust, relationships, connection) played into your experience with this course?
- How did wonder influence your dissertation topic?

Influence of Community & Relationships:

- How did your comfort in the classroom change as the semester progressed?
    - What role do you feel vulnerability played in your classroom and coursework?
- How do you see wonder playing into other areas of your life, such career and hobbies?
- Looking back, how do you feel your attitudes toward your career shifted as the course progressed and afterwards?
- How did your peers influence your thoughts about your current career or your career options?
    - How did others outside of the program influence your path throughout the course?
    - What did your conversations with them look like compared to your conversations with your classmates and peers?

Concluding Questions:

- What did you learn about yourself through the wonderment project?
- How do you think actively participating in wondering influenced your thoughts about being a doctoral student? A student/learner? A researcher?
- How do you define wonder now?
- Is there anything that you might not have thought about before regarding the wonderment project that occurred to you during this interview?
- Is there anything else you think I should know to understand your experience with the wonderment project better?

- Is there anything you would like to ask me?

Conclusion:

Thank you for taking the time to talk with me today and share your experiences. As a reminder, I was collecting this data as part of a research team that is focused on learning more about wonder and its use in the classroom as a teaching tool.