

RE-CONCEPTUALIZING GRADUATE STUDENT CROSS-CULTURAL SOCIALIZATION:
A NOVEL STRENGTH-BASED PERSPECTIVE

by
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DEDICATION

I dedicate this three-article dissertation to my grandma, parents, and dear beloved husband for their unconditional love during my doctoral journey. Thank you for giving me strengths and inspiring me to search for the truth. I also dedicate my dissertation to those who experience painful racism and who struggle fighting racial traumas, yet succeed with inner strengths.

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ABSTRACT

Much of the existing literature on graduate education comes from a deficit perspective, which is problematic because it blames individual failure on family background, language, or lack of cultural knowledge. Given the pervasive nature of systemic racism, this deficit model is a classic “blame the victim” approach.

Instead, my three-article dissertation emphasized the strengths that graduate students bring with them and develop on their journey. The unifying theme is the focus on cross-cultural socialization through a strength-based perspective. Collectively, findings from these studies cohere around this strength-based approach. The three articles employ various epistemological, theoretical, and methodological perspectives to contribute to understanding and supporting graduate students’ cross-cultural socialization experiences. Throughout the dissertation, I explored important cross-cultural socialization constructs such as cultural congruity, academic confidence, peer, faculty, and institutional interactions, cultural capital, cultural strengths, and multiple identities.

The first article relied on a critical quantitative lens to examine the cultural congruity and academic confidence of AI/AN students. Our results found elevated levels of cultural congruity among those students who reported more favorable peer interactions, but the simultaneous experiences of mentor’s cultural support and university environment fit did not reveal such an influence. Students reported greater levels of academic confidence in the presence of mentor’s cultural support and university environment fit but not for peer influence. We situated the findings within prior research and identified where universities, peers, and mentors can provide cultural support, inspire academic confidence, and further enhance well-being through honoring the cultural strengths of AI/AN students.

The second article was a qualitative study that used narrative inquiry to understand the cross-cultural socialization experiences of three Chinese international doctoral students. My findings suggest that Chinese international doctoral students use various forms of cultural capital (aspirational, linguistic, familial, social, navigational, and resistance) as leverage in their cross-cultural socialization journey. The third research article was another narrative inquiry study that built upon the second study to further understand Chinese international doctoral students’ cross-cultural socialization experience. My findings suggested that cultural strengths helped to empower Chinese international doctoral students and develop their personal, social, cultural, and professional identities.

CHAPTER ONE

INTRODUCTION OF UNIFYING TOPIC

My three-article dissertation is titled *Re-conceptualizing Graduate Student Cross-cultural Socialization: A Novel Strength-based Perspective*. My research is unified by the theme of strength-based socialization and covers the following areas: (1) socialization experiences of culturally diverse graduate students (e.g., American Indian and Chinese international students); (2) strength-based understanding of graduate students' cross-cultural socialization; (3) multiple dimensions of student identity and the meaning-making process; and (4) culturally aware mentorship for graduate students' professional development.

My research marshals two methodological approaches (quantitative and qualitative) to investigate cross-cultural socialization. The unifying research question is, "What are the theoretical underpinnings and practical ways to provide positive cross-cultural socialization experiences for AI/AN graduate students in STEM and Chinese international doctoral students?" The three-article dissertation approach is important for my doctoral and career trajectory because it (1) enables me to develop a strong repertoire of methodological research skills; (2) creates a holistic view of graduate student learning that connects with multiple identities; and (3) translates pedagogy into practical guidance for important public stakeholders such as administrators, faculty, staff, and students.

Historical Background for U.S. Graduate Education

The history of graduate education development in the U.S. has been underexplored in comparison with undergraduate education (Nerad et al., 1997; Walker et al., 2008). The

historical background is important because it helps to understand the context for my research about graduate students' cross-cultural socialization. Using available sources, I will explain the history of graduate education building upon the distinct stages conceptualized by Walker et al., (2008).

First Stage of Graduate Education: Establishment

The first historical stage of American graduate education was the “establishment” phase (the period of the 1880s to the 1930s), which involved the creation of institutions by having faculty members teach both undergraduate and graduate courses (Walker et al., 2008). During that time, university funding for graduate schools and research mainly came from undergraduate teaching, i.e., tuition and endowment funded faculty and teaching assistantships for graduate students (Gardner & Mendoza, 2010). Many professional societies and scholarly journals were established, and universities increasingly valued disciplinary expertise (Nerad et al., 1997). With this change, power shifted from the university president to increasingly autonomous academic departments (Peterson et al., 1988). All these opportunities signaled the development of research infrastructure and organizational efforts to promote graduate study (Walker et al., 2008). However, two pressing challenges also came during the establishment stage. First, some faculty members were resistant to the university effort to expand graduate education due to the fear of stretching limited resources too thin and their own need to remain current and stay engaged in research (Nerad et al., 1997). Second, faculty were concerned about the balance between teaching and research, fearing that an emphasis on research would reduce their effectiveness in working with undergraduate students (Altbach et al., 2011). In thinking about the function of the

university and my role as a doctoral student, I realize how often we take these opportunities and challenges for granted.

Second Stage of Graduate Education: Expansion

The second stage of graduate education took place in the decades of 1940s through 1960s and was the “expansion” stage linked with federally funded research (Walker et al., 2008). This stage is sometimes called the “Golden Age of higher education” due to the explosive growth and relative abundance of funding. It was heavily influenced by World War II (WWII) and the Servicemen's Readjustment Act (aka the G.I. Bill) in 1944 because the latter allowed middle and working class students to go to college, a milestone in breaking down economic and social barriers to college attendance (Altbach et al., 2011; Ornstein et al., 2016). Worth noting is that the G.I. Bill also influenced the organization, structure, and function in ways that brought increased funding from state and federal governments and foundations, which in turn expanded undergraduates who might choose to go on to research-based graduate programs (Thelin & Gasman, 2003). This phase continued with the baby boomers, those born in the post-WWII era and who began attending universities in the 1960s, leading to another increase in enrollment and rapid expansion of colleges (Nerad et al., 1997). With the escalation of America's war against Vietnam in the mid to late 1960s, baby boomers opposed being subject to the military draft, college enrollment offered draft deferments, and the anti-war movement became a big part of campus life as American colleges became politicized as never before (Spielvogel, 2018). During this time, growth rates were greater for graduates than undergraduates, which brought more federal funds to develop university infrastructure, supported faculty conducting research, and provided graduate students with research fellowships (Chambliss & Takacs, 2014; Thelin, 2011).

Third Stage of Graduate Education: Retrenchment and Innovation

The third stage was “Retrenchment and Innovation” during the 1970s, referred to as “the new depression in higher education” due to the reduction of federal funding and the reduced number of academic faculty positions (Walker et al., 2008). During this time, the number of graduate applications continued to increase and a three-part conversation about the purpose of graduate education began (Golde & Walker, 2006; Walker et al., 2008). One, the National Board on Graduate Education (1975) urged universities to serve non-traditional graduate students, such as part-time and older students, with the intent to apply what they learned to solve regional and national problems. Two, some professional organizations such as the American Philosophical Association advised undergraduates not to take a PhD because there were limited faculty jobs available (Cassuto & Weisbuch, 2021). Three, many graduate students expressed concerns about their program’s relevancy and structure, such as the requirements for languages and the timing for comprehensive examinations. This led in some cases to the removal of the foreign language requirements and the development of new graduate programs (Nerad et al., 1997; Walker et al., 2008). These first three historical stages provide context for understanding today’s graduate programs and students would benefit from learning the history behind graduate education.

Fourth and Fifth Stages of Graduate Education: Diversification and Waves of Reform

The fourth stage was the “diversification and fragmentation” (during the 1980s and 1990s) with an increasingly diverse graduate student population (Walker et al., 2008). During this stage, there were three major trends. One, more and more women attended doctoral programs and new graduate disciplines grew beyond traditional programs (Golde & Walker, 2006). Two, Asian students increased especially rapidly as international graduate students,

accounting for 24,000 doctoral degrees in the 1990s (Goodchild & Wechsler, 1997). Finally, the diverse non-academic careers in private industries became possible for students from graduate programs (Nerad et al., 1997). The diversification phase continues to influence the fifth stage, “waves of reform”. Reform efforts originated from stakeholders considering disciplinary differences and alternative career options for graduate students (Altbach & Finkelstein, 1997; Nerad et al., 1997; Walker et al., 2008).

The Sixth Stage of Graduate Education: Support Graduate Student Wellness

In the current stage of graduate education, the following issues have arisen: (1) graduate degrees as the new stratifying credential (i.e., more jobs require an advanced degree beyond the undergraduate degree, also called “credential inflation”); (2) Marxist critique of graduate students as low wage workers with limited rights; (3) limited academic positions, especially tenure-track faculty positions for doctoral students; and (4) the growing concern for graduate students’ mental health and wellness (Lee, 2021). This latter issue pre-dated COVID-19 but was magnified during the pandemic. The Council of Graduate Schools (CGS) focuses on the growing concern for graduate students’ wellbeing and mental health challenges. The recent report titled *Supporting Graduate Student Mental Health and Well-being: Evidence-Informed Recommendations for the Graduate Community* from CGS and the Jed Foundation (JED) contextualizes the urgency of this issue and provides institutions a blueprint to support graduate students’ academic success and wellbeing (CGS, 2021). I situate my dissertation research within the sixth stage of graduate education.

Moreover, international graduate students face unique mental health challenges (Lee, 2021). According to Lee (2021), students with multiple marginalized identities/intersectionality,

i.e., students with disabilities, woman, and international graduate students of color, reported higher mental health challenges in addition to time-based demands, unstructured and unpredictable academic processes, sense of not belonging, financial stress, self-doubt, work/life balance, and faculty supervisor engagement (Cornwall 2019; Lee, 2021; Posselt, 2021). In a 2018 survey of graduate deans, 63% respondents strongly agreed or agreed that graduate students struggle to maintain mental well-being more than students five years ago (CGS, 2021). Further, CGS (2021) made a call to action for all stakeholders (university presidents, provosts, graduate school deans, and faculty) to: (1) prioritize diversity, equity, and inclusion; (2) develop mechanisms for recognizing and rewarding high quality mentoring and ensure program expectations, resources, and processes are transparent; (3) identify stress points around major program milestones, (e.g., comprehensive exams or execution of dissertation requirements) and provide mechanisms for supporting students through those transitions; (4) model the importance of work/life balance and self-care; and (5) recognize and support students' diverse career goals. The CGS guidelines (2021) also emphasizes that graduate students have a critical role to play in helping faculty and administrators understand the challenges they face and the resources they need. In addition, graduate students need to embody principles of self-care and compassionate mentoring for undergraduates and their peers. My novel strength-based perspective addresses these concerns with a focus on the persistence and resilience that help graduate students succeed despite the challenges. Thus, I advocate for reframing or shifting the narrative so that mental health and wellbeing struggles are not deficiencies but challenges that graduate students can overcome through taking an active role and agency in managing them.

State of Understanding of Graduate Student Socialization

The purpose of this chapter is to ground this conversation in the scholarly literature around the key constructs, central theories, and themes that illuminate the issues associated with graduate student socialization in higher education. In reviewing the existing literature, I utilized databases, such as Google Scholar, ERIC, PsycInfo, JSTOR, and ProQuest to identify empirical research. Other than the seminal work, the year restrictions for the literature review are over the last two decades (post-2000), a period after the concepts of socialization and graduate students' experiences in the U.S. shifted greatly. Moreover, I selected publications based on impact, the scholar's reputation, and relevance to graduate student socialization. Additionally, I investigated chains of citations to identify the recent development of critical work. In this section, I will provide the reader with a roadmap to graduate student socialization, factors that shape graduate student socialization, and the gaps in the literature.

What is Graduate Student Socialization?

Socialization theory provides theoretical and empirical evidence for understanding student experiences in graduate school and shaping research on graduate student preparation in higher education (Austin, 2002; Tierney, 1997; Weidman et al., 2001; Weidman et al., 2016; Weidman et al., 2020). Socialization is operationalized as the structural and developmental process through which individuals learn to apply the values, attitudes, knowledge, skills, and standards needed for them to effectively participate as members of the group (Barretti, 2004; Weidman et al., 2014). Building on the body of work on socialization, graduate student socialization refers to a process of successfully integrating into graduate school culture and the

academic profession (Gardner & Barnes, 2007). Golde (1998) described socialization in graduate school as:

The socialization process is one in which a newcomer is made a member of a community—in the case of graduate students, the community of an academic department in a particular discipline. The socialization of graduate students is an unusual double socialization. New students are simultaneously directly socialized into the role of graduate student and are given preparatory socialization into a profession (Golde, 1998, p. 56).

Furthermore, Golde (1998) presented four general tasks of socialization for graduate student life and their future careers: (1) gaining intellectual competence through coursework, research, and other professional experiences; (2) learning about the realities of life as a graduate student by understanding the struggles and commitments; (3) learning about the future profession; and (4) integrating into the department by building relationships with faculty, peers, and finding a sense of belonging.

The most commonly cited theoretical lens and seminal work on graduate student socialization is the Weidman-Twale-Stein framework (Weidman et al., 2001). Socialization is an ongoing process and graduate student experiences are conceptualized as four stages: anticipatory, formal, informal, and personal (Weidman et al., 2001). Anticipatory socialization refers to expectations of graduate school and is often idealized as what graduate school should be. Formal socialization refers to being at graduate school and learning to become a scholar (involved in the experience of teaching, research, and service). Informal socialization attributes to how a student's life, campus climate, and peer interactions connect together. Personal socialization refers to students forming their scholarly identity and becoming personally involved in their research interest (Li & Collins, 2018). At each stage, students engage in the academic culture, develop professional identity, and commit to the roles and responsibilities associated with the

profession. These four stages are iterative and interactive, wherein graduate students can reside in multiple stages at any one period of time during their education depending on their level of understanding, cultural learning, skill development, familiarity, and role expectations (Austin & McDaniels, 2006; Weidman et al., 2020).

Factors That Shape Graduate Student Socialization

Socialization is important for all graduate students, regardless of academic field or discipline (Weidman et al., 2020). Successful socialization is positively associated with student outcomes, such as one's academic confidence in the ability to conduct research and socialize in the field (Strayhorn, 2018). Also, graduate school is a socialization process where graduate students develop their professional identity and transition from graduate students to independent researchers (Baker & Pifer, 2011; Gardner, 2008a; Lovitts, 2008; Sweitzer, 2009; Weidman et al., 2014). During the journey to becoming a scholar, there are several factors (i.e., peers, university environment, and professional associations) that may shape socialization (Gardner & Mendoza, 2010; Weidman et al., 2020). Socialization of graduate students occurs through classroom learning, interactions with faculty mentors, peers, department, a broad set of campus resources (referred to as "institution interactions"), and the larger professional community (Weidman et al., 2001; Weidman et al., 2020). Through these interactions, students gain knowledge, skills, and abilities that shape their professional lives to socialize into the academic norms and values (Gardner, 2008b; Weidman et al., 2001).

Faculty advisor support and mentoring matters the most to graduate students' positive socialization experience for four vital reasons (Barnes & Austin, 2008; Gardner, 2009; Lovitts, 2005). First, it is evident within the graduate education literature, socialization theory

hypothesizes that faculty are the primary socializing agent for graduate students' success in academic and cultivating disciplinary identities (Golde, 2000; Weidman et al., 2001; Weidman et al., 2020; Weidman & Stein, 2003). Second, through mentoring relationships with faculty mentors, graduate students are socialized to understand their departments and disciplines' expectations, roles, and values (Golde, 2000; Golde, 2005; Weidman et al., 2001). More specifically, faculty mentors contribute to the quality of graduate students' socialization experiences by providing opportunities to integrate into the research environment, such as collaborating on research projects, conference presentations, and publications (Laverick, 2016; Lechuga, 2011; Weidman et al., 2016). Third, faculty can provide students with access to a professional network of colleagues that can potentially lead to multiple mentors, sponsors, interdisciplinary research collaborations with other graduate students, or future employers (Austin & Wulff, 2004; de Janasz & Sullivan, 2004; Lovitts, 2008). Faculty have a vested interest because graduate students are the next wave of scholars who will advance the discipline (Austin, 2002; Golde, 2005). Finally, prior research (Curtin et al., 2016; Lunsford, 2012; Packard, 2015; Rosser, 2004) indicates that faculty mentoring positively contributes to graduate students' academic confidence and the desire to pursue academic positions upon graduation.

Further, scholars have found that graduate student advising and mentoring interactions with faculty are more significant to degree progress and completion than peer relationships (Anderson et al., 2013; Carpenter et al., 2015; National Academies of Sciences, Engineering, and Medicine, 2020). However, we should not neglect the roles that peer mentors can play in providing emotional support and validations that are integral to graduate students' socialization experiences (Collier, 2015). In general, new graduate students integrate to their programs by

learning informally from senior students who share similar values, academic motivation, social identities, scholarly pursuit, and career aspirations (Gardner, 2010). Graduate socialization processes are facilitated by faculty and peer mentors that provide support for developing the scholarly potential of students as well as for perpetuating the traditional values of academic life and intellectual curiosity (Strayhorn, 2018).

Gaps in Graduate Student Socialization: How to Move Forward?

Graduate student socialization is important because a significant amount of scholarship has shown that inadequate socialization is associated with graduate student attrition (Barnes, 2009; Gardner & Barnes, 2007; Golde, 1998; Terrell et al., 2009). Strayhorn (2018) and Nettles et al. (2006) indicate that 50% of students “drop out” of their graduate programs before completing their degrees, not accounting for those who “take a break” from their graduate studies and return afterwards. More importantly, previous studies have explored key constructs that are important to graduate student socialization. In synthesizing the empirical literature, I identified seven salient themes: (1) socialization in the context of becoming independent researchers and scholars (Gardner, 2010; Gardner & Mendoza, 2010); (2) the hidden curriculum of graduate education (Calarco, 2020; Harding-DeKam et al., 2012); (3) employability and expert workforce opportunities outside academia (Tomlinson, 2012); (4) socialization to disciplinary context (Boden et al., 2011; Gardner et al., 2013; Walker et al., 2009); (5) socialization in higher education and early career faculty (Austin, 2002; Mullen, 2012; Weidman et al., 2020); (6) part-time doctoral student experiences (Gardner & Gopaul, 2012); and (7) diversity, equity, inclusion, and justice in graduate students’ socialization (Perez et al., 2019; Weidman et al., 2020).

With this foundational knowledge from the literature on graduate student socialization in mind, I will highlight two important gaps. First, Weidman's et al, (2001) socialization model of graduate student socialization has been criticized for being monolithic and failing to recognize the individual characteristics of students and the synergistic relationships between mentors and mentees (Gardner 2010; Gardner & Mendoza, 2010). In other words, mentors and mentees can foster reciprocal relationships during the positive socialization experiences where mentors will not only be positive role models but also learn innovative ideas from their mentees. Socialization is not unidirectional but a more nuanced and bi-directional (two-way) approach between students and their faculty mentors (Winkle-Wagner et al., 2020). For example, the co-mentoring model (McGuire & Reger, 2003) conceptualizes the socialization of graduate students as a process of mutual exchange and reciprocal relationships rather than something done to students by faculty and peer mentors. The importance of multiple mentors is vitally important for graduate students, especially Indigenous or international students given that they come with multiple ways of knowing that transcend the Western paradigm (Kovach, 2021). Moreover, co-mentoring should highlight the importance of collaborative learning experiences that will foster paths to successful degree completion and career advancement (Gardner, 2010). From an indigenous perspective, Deloria and Wildcat (2001) critique the process of socialization as a Western concept which focuses on training students to present an "acceptable profile" as a professional without considering the emotional and spiritual development of the person (p. 79). Traditional Western concepts of socialization have relied on something that was "done" to the student rather than students being active participants in the process. Second, much of what has been written about socialization in higher education focuses on traditional graduate students (Antony, 2002;

Gardner, 2010). Far less is known about minoritized graduate students' cross-cultural socialization experiences from a strength-based perspective, particularly graduate students with diverse experiences and characteristics (Weidman et al., 2020).

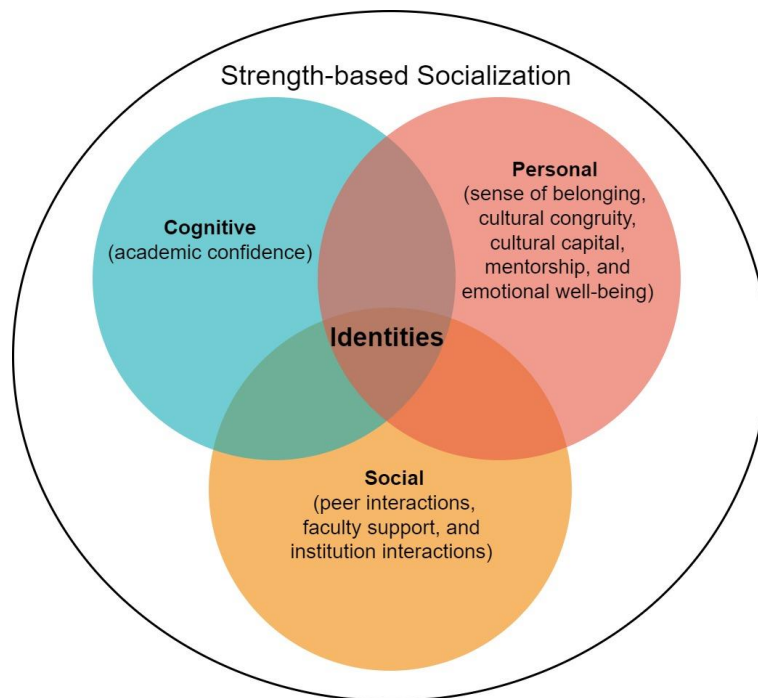
Overview of The Unifying Topic & Subsidiary Issues

The broader theme unifying this research is strength-based cross-cultural socialization for graduate education. There are two iterative aspects to the strength-based approach. The first is the important role that mentors play in empowering graduate students in socializing them to the profession. The second is the strengths graduate students bring with them and develop through the socialization process. Strength-based education aligns with Chickering and Reisser's (1993) synthesis of respect for strengthening identity development and empowering individuals to flourish (Chickering & Reisser, 1993; Fenton, 2008; Lopez & Louis, 2009). However, as a new line of inquiry, I intend to focus on the strengths students bring with them to graduate programs (Otters, 2012). These strengths include cultural capital such as aspirational, linguistic, familial, social, navigational, and resistance as outlined by Yosso's cultural wealth framework (Yosso, 2005). Although Yosso's cultural capital framework was based on Chicana/Latino/a undergraduate students and not graduate student socialization, I believe it provides a lens for how minoritized students' cultural strengths can be successfully leveraged.

Socialization of graduate students is a process which occurs through interaction with peers, mentors, and a broad set of campus resources (referred to as "environment interactions"). Through these interactions, students gain knowledge, skills, and abilities that shape their professional lives and multiple identities, including personal, social, cultural, and professional identities (Gardner, 2008; Weidman's et al, 2001). I developed Figure 1 to illustrate how the

literature guided the constructs in my three-article dissertation. I operationalized strength-based graduate students' cross-cultural socialization in three dimensions (1) cognitive (academic confidence); (2) personal (sense of belonging, cultural congruity, cultural capital, culturally attuned mentoring, and emotional well-being); and (3) social (peer interactions, faculty support, and institution interactions). The synergy of the three studies allows us to view culturally diverse graduate student identity development in a more holistic way.

Figure 1. Strength-Based Socialization Model



The first study uses a strength-based perspective to understand the social and cultural experiences that positively foster psycho-social and academic development of AI/AN graduate students in STEM. This strength-based perspective is informed by research that has focused on the academic success of AI/AN students (Windchief et al., 2018; Windchief & Brown, 2017). Other research indicates that high levels of cultural congruity and environmental fit contribute to academic resilience in other underrepresented racial populations (Chang et al., 2014; Keith et al.,

2016). Further, recent studies have shown that cultural values influence AI/AN student success in STEM (Chow-Garcia, 2016; Johnson et al., 2017; Mackey, 2017).

The second and third studies continue the main theme of strength-based cross-cultural socialization. These two studies add sub-constructs of the socialization process such as multiple identities and cultural strengths that Chinese international doctoral students bring with them to the cross-cultural socialization process, and an investigation of how these sub-constructs interact with mentor and peer interactions. They explore a strength-based understanding for how Chinese international doctoral students use their cultural capital (Yosso, 2005). For example, Chinese language is a strength that supports identity development in the cross-socialization process. These bilingual students can access resources such as Chinese-language literature that gives them diverse content and multi-cultural perspectives.

Findings from my three-article dissertation propose a new strength-based lens for understanding cross-cultural socialization of graduate students. There are two elements of this strength-based lens. First, it relies on the strengths that graduate students bring to the socialization journey including their cultural, personal, and social identities. Second, it emphasizes the role that mentors and peers play in empowering graduate students in the socialization experiences. More importantly, the study will be a unique addition to the literature by examining how both mentees and mentors can be culturally aware of their identities and cultural backgrounds, with this awareness enabling cultural and cross-cultural learning to occur. Furthermore, at a practical and (for universities) economic level, the recognized need for student diversity is a growing trend in higher education and many universities struggle to recruit and retain diverse graduate student populations (Altbach et al, 2019). Thus, my research goal is to

create meaningful culturally aware cross-cultural practices that are consonant with the identities that graduate students bring with them and develop during their graduate education.

Strength-Based Perspective for Cross-Cultural Socialization: Dismantling the Deficit Mindset

The unique aspects of my three-article dissertation are the focus on cross-cultural socialization and mentorship using a strength-based perspective. The role of cross-cultural socialization as a meta-topic relates back to the unifying theme for the three articles. Many authors have addressed graduate student socialization (Gardner, 2009; Gardner, 2010; Gardner & Mendoza, 2010; Weidman's et al, 2001; Weidman & Stein, 2003). However, cross-cultural socialization adds a strength-based approach to mentoring and presents a novel contribution to the literature.

Most of the literature theorizes students using a deficit paradigm, which has been pervasive in educational sociology for over a century, meaning “differences in academic achievement by different groups of students are due to deficiencies within students, their families, and/or their culture” (Hogg & Volman, 2020, p.863). In contrast, a strength-based perspective is a holistic view of student qualities and strengths regarding their aspirations, including the knowledge, talents, skills, capacities, cultural resources, and relationships (Saleebey, 2008). The limited research about Chinese international doctoral students using a strength-based approach constitutes a gap in the current literature (He & Hutson, 2018; Heng, 2016). To address this gap, I draw on existing scholarly work from a strength-based perspective and investigate how these theoretical concepts can be applied to empower diverse students during their graduate school journey.

Faculty mentors and institutions can encourage students to rely on cultural diversity as strengths in the socialization process. Cultural diversity presents an opportunity for encouraging intercultural understanding through the sharing of cultural experiences and knowledge (Manning & Colaiacomo, 2021). As such, students' range of experiences and cultural backgrounds play vital roles in their cross-cultural socialization to graduate school (García & Guerra, 2004; Gopaul, 2016; Véliz, 2020). Cultural diversity is a fundamental component of these students' socialization experiences and research indicates that culturally congruent mentoring is grounded in a strength-based approach in helping students of color cultivate a sense of belonging (Griffin et al., 2020; Thomas et al., 2007).

The Significance and Relationships of The Topics

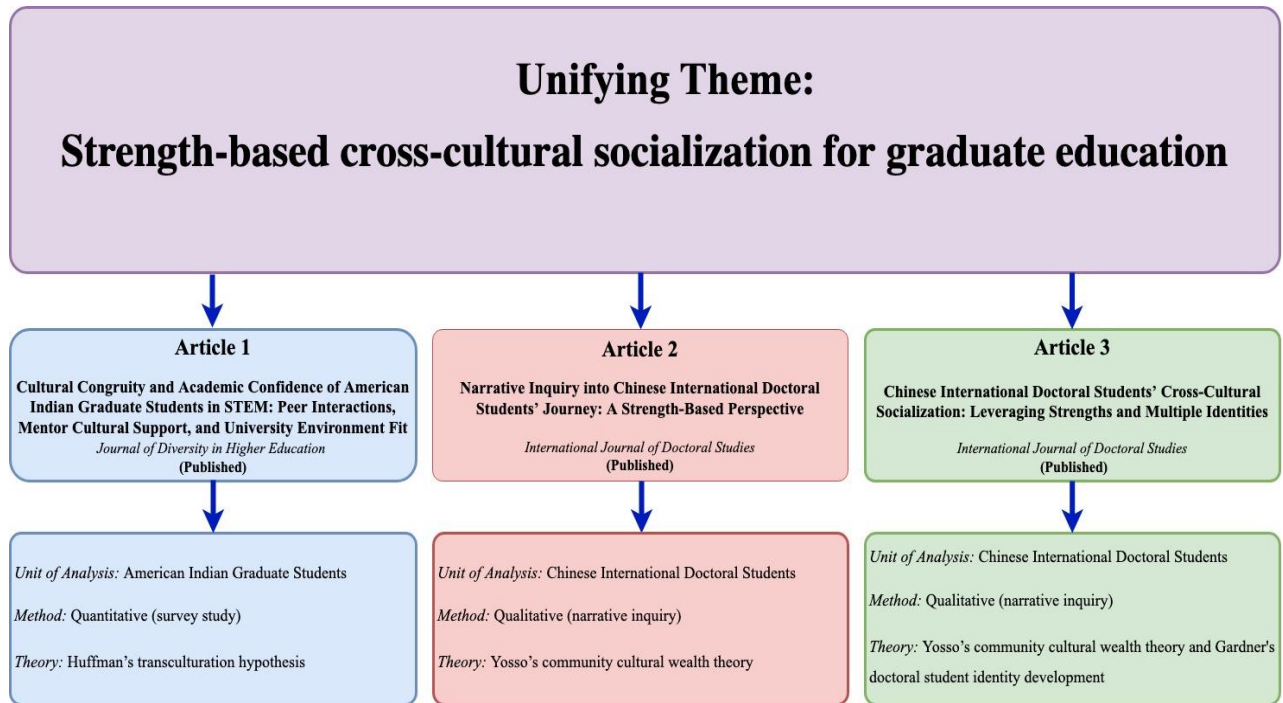
The significance and relationships among the topics include: (1) help students understand how multiple identities shape their learning and how institutions can provide support that improve academic success while honoring individual identities; (2) promote well-being by bridging cultural gaps and enhancing cross-cultural learning and international partnerships in university settings; and (3) support positive cross-cultural strength-based socialization experiences where students may develop their identities, gain academic confidence, and express new ideas. Socialization is not something that is done to students, but an active process in which students bring strengths in the form of their cultural capital and multiple identities which they actively use as part of their socialization. As another important aspect of my work, I argue that strength-based socialization does not require graduate students to compartmentalize, abandon, or hide their cultural identity. Instead, they can use their cultural strengths to manage, engage, and interact in a way that is consistent with who they are and where they come from.

In these ways, my three-article dissertation creates a strength-based approach to understand graduate student cross-cultural socialization experiences, which is a unifying theme for the three articles. Figure 2 shows how the broader topic relates to the topics covered in each article. Positive socialization experiences increase academic confidence and feelings of cultural congruity. Universities can create a climate that celebrates multiple identities through effective strength-based socialization and mentoring practices. AI/AN, Chinese international graduate students, and other diverse learners may benefit from peer and faculty mentors in different ways. Understanding various socialization needs will help tailor social activities and inclusive learning environments for specific groups. Institutions have an opportunity to create a climate that celebrates students' cultural heritage as a strength of their academic success. This moves the narrative away from the deficit perspective that is pervasive in the discussions of AI/AN, Chinese, or other minoritized graduate student populations in higher education.

Importantly, findings from my three-article dissertation include the caveat that culturally diverse students are not a monolithic group. I accounted for the cultural differences in the strength-based socialization model by examining literature across different races/ethnicities groups. Cultural identity for students from a particular culture lies on a continuum and as such students may vary widely in how they tap their various cultural identities as strengths vs. deficits (Gay, 2018). Two areas of significance for this study include a contribution to the literature and practical recommendations to inform important stakeholders (faculty, administrators, staff, and students) about how to create a more diverse, supportive, and inclusive socialization environment for graduate students. Likewise, my research will provide valuable practical insights for

researchers, practitioners, and policymakers to support the unique needs of cross-cultural strength-based socialization experiences.

Figure 2. A Graphic Representation of the Three-Article Dissertation



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CHAPTER TWO

POSITIONALITY

“It is only by healing from injustices and dissolving our personal barriers to connection that we develop the ability to view others with compassion and to live in community with people of vastly different backgrounds and viewpoints.” - Rhonda V. Mage

Introduction

Positionality is defined as how our worldviews, identities, and philosophical assumptions intersect with our research agenda and the broader social and political context (Holmes, 2020; Major & Savin-Baden, 2013). According to Mertens and Wilson (2019), our philosophical assumptions include axiology (ethics), ontology (reality), epistemology (knowledge), and methodology (systematic inquiry). I rely on a social constructionism paradigm to frame my research on the construction of a shared meaning-making process between me (the researcher) and participants. Kegan (1982) explained that meaning-making is “the place where the event is privately composed, made sense of the place where it actually becomes an event for that person” (p. 2). An interpretive paradigm, social constructionism emphasizes that reality is created collectively and knowledge is co-constructed through multiple values and perspectives (Given, 2008).

My positionality guided the research design of my three-article dissertation titled *Re-conceptualizing Graduate Student Cross-cultural Socialization: A Novel Strength-based Perspective*. As Windchief et al., (2017) state in their article about self-location statements, sharing our background and positionality helps develop a relationship with the audience when

reading the author's work. In this section, I reflect upon my cultural heritage as a Chinese American and explain how my cultural identity influences the way I experience the world and the strength-based approach that I emphasize in my research. Importantly, my Chinese cultural values and cross-cultural awareness align with Indigenous values such as relevance (相关, xiāng guān), responsibility (责任, zé rèn), reciprocity (互惠, hù huì), respect (尊敬, zūn jìng), and relationships (关系, guān xì) (Bell, 2013; Kirkness & Barnhardt, 1991). I have embraced these values in every aspect of my life and they are now inherent in my research and are demonstrated in all three articles. For example, these values shape the ways in which I approach my research and participants in order to understand, acknowledge, and validate their stories.

My insider values bring certain strengths to my three-article dissertation and provide a unique perspective. For instance, there are inherent advantages to my experience that provide greater insight into the phenomenon, such as my deep understanding of Chinese language and culture in relation to my dissertation article two titled *Narrative Inquiry into Chinese International Doctoral Students' Journey: A Strength-Based Perspective*. Additionally, as an immigrant in American culture, I strive to balance the cross-cultural differences by creating a new sense of identity as a Chinese American woman. This was especially helpful and relevant to my dissertation article three titled *Chinese International Doctoral Students' Cross-Cultural Socialization: Leveraging Strengths and Multiple Identities*. Throughout the research process, I am aware that my cross-cultural values will not only reflect how I engage with participants, but also guide decisions for my research approach, data collection, and analytical techniques.

I created Figure 3 and organized my positionality chapter into three main sections. This chapter is framed at a macro level context to transform the self, self in relation to others (for

example, participants), and from self to system. At a micro level, I created Figure 4 to integrate “the 5 Rs”— relevance (相关, xiāng guān), responsibility (责任, zé rèn), reciprocity (互惠, hù huì), respect (尊敬, zūn jìng), and relationships (关系, guān xì)—throughout each main section because these values are important in my worldview. Building on “the 5 Rs”, I identified a gap in the existing research and addressed it by adding a sixth R, which is “reflexivity” (反思, fǎn sī).

Figure 3. Self, Self in Relation to Others, and from Self to System

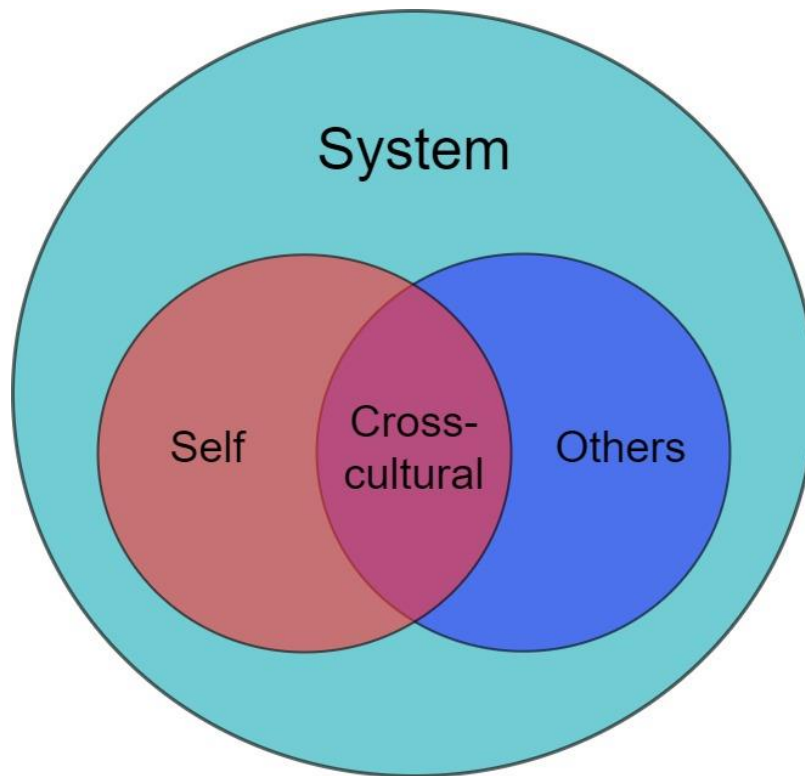
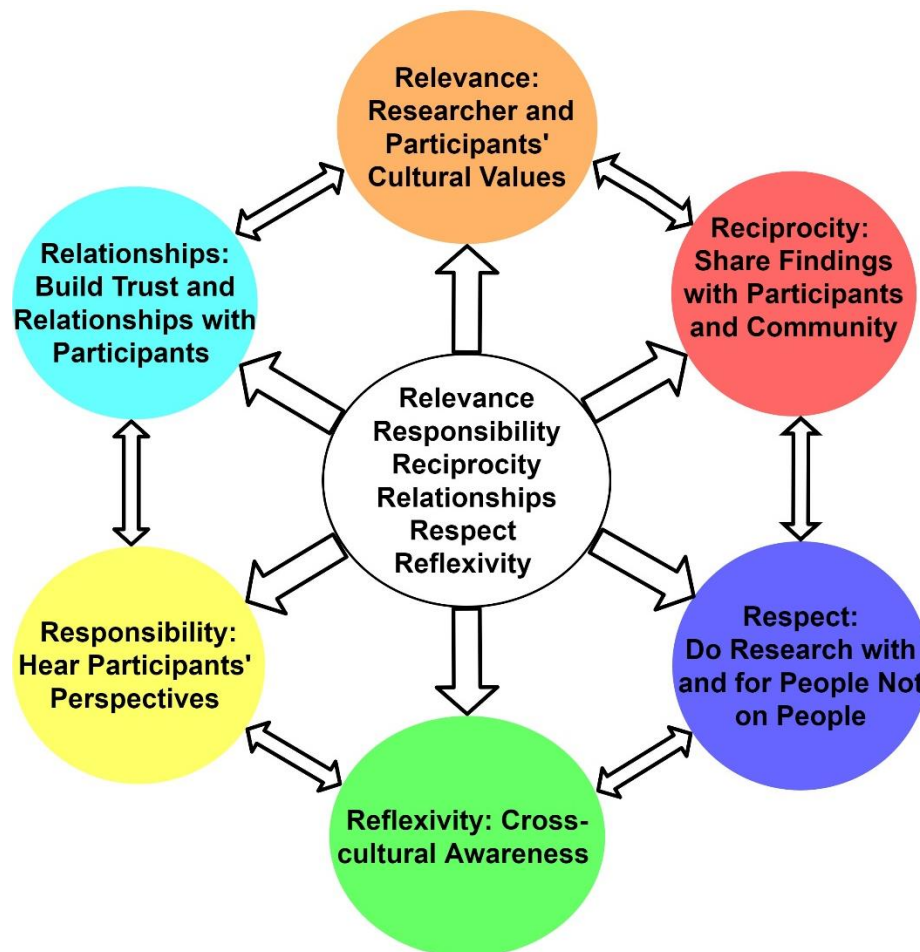


Figure 4. Values Guided My Positionality and Three-Article Dissertation



Self: Cultural Pluralism vs. Assimilation

I grew up in a working-class Chinese family in Guangzhou, a city of 15 million in southeast China. I was raised and nurtured by my grandmother, who lived for 95 years and passed away in 2016. My grandfather died before I was born, so my grandmother had become a wise independent woman. I am the first person in my family to attend a university and the first to come to America. Neither of my two brothers had the desire or preparation necessary for college. Even though my parents and grandmother identified strongly as working-class people, I grew up

with stories that inspired me to continue my education and challenge the status quo. For example, when I was in middle school, my father encouraged me that education is one way that an individual could change their socioeconomic status. Later, he told me he would send me to work in a clothing factory if I did not study hard to get into a good Chinese university through the required Chinese College Entrance Examination. My parents had a strong commitment to my education and success, as they often told me, “望女成凤 (wàng nǚ chéng fèng)”. This Chinese idiom literally means hoping one's daughter becomes a phoenix despite challenges. In Chinese culture, “phoenix” symbolizes “a successful and bright future”. My parents worked all day and night to support me and pay for my tuition, so I could focus solely on my education.

As a first-generation college student, I studied Teaching Chinese as a Second Language and English Education as a route to see the world and understand international cultures. When I was a child, I enjoyed school and dreamed of becoming a teacher. As an undergraduate, my career goal shifted from being a teacher at the K-12 level to becoming a professor in higher education because through research I discovered how to find agency, develop my voice, and contribute to something larger than myself. I chose my major as a foundation for graduate study and research. After I immigrated to Montana, U.S., I found out that few Americans learn Chinese. This was a surprise to me, because so many Chinese students and young professionals study English. I decided to teach Chinese as a second language for Adult Education from prior to entering my MS program. In essence, me doing this (teaching Chinese to Americans) was consistent with my values of cultural pluralism and cross-cultural learning.

As an example of using strength-based and cultural identity to successfully navigate higher education, I pursued a MS in Technical Communication with the hopes that I could teach

and perform research in cross-cultural communication and multicultural education. After graduating from the M.S., I had an instructor position with Montana Tech where I taught traditional and online courses at the undergraduate and graduate (MS) levels, including Intercultural Communication, Presenting Technical Information in the Petroleum Industry, and Research Methods.

Bilingual or multilingual communication can be a strength and has benefited my research, participants, and audience. I am fluent in English and am a native speaker in Mandarin and Cantonese and various Chinese dialects. Further, it is evident through my ability to use my cross-cultural communication skills in teaching to communicate in multiple languages/Chinese dialects and relate to students from both China and the U.S. For instance, I mentored and advised American MS graduate students in framing their thesis topic, selecting research methods, and implementing research. During this time, I assisted a Montana Tech professor in a course for graduate students majoring in geoscience at Sun Yat-sen University in Guangzhou, China on how to develop manuscripts for publication in prestigious English language peer-reviewed journals. Likewise, I taught the graduate students how to design academic posters and deliver professional presentations.

Relevance (相关)

My identity as a Chinese American woman scholar and the first in my family to pursue a PhD degree is relevant to my commitment to integrate teaching, research, and service. For example, I teach and research culturally attuned mentoring and socialization experiences in graduate education. I was born and educated in China for 20 years and later became a naturalized U.S. citizen. I have lived in the U.S. for more than a decade, which I learned could be a melting

pot (assimilation, i.e., discard original cultural identity and adopt the dominant culture's values) or salad bowl (cultural pluralism or multiculturalism, i.e., retain original cultural identity while adopting American values). I self-identified with the latter because I choose to integrate my Chinese language, culture, and identity with American society and higher education. For example, I retain my Chinese given name and do not use an English name. According to Ryabichenko and Lebedeva (2016), "integration" involves contact and identification with both cultures. In contrast, "assimilation" refers to assimilate into the dominant society and giving up one's heritage culture. I would argue that the terms "integration" or "cultural pluralism" align with the strength-based perspective by validating diversity and multiculturalism. While the term "assimilation" communicates the deficit-based cultural lens that individuals have to abandon their unique cultural identities in order to be successful.

As someone who refused to assimilate, the Chinese idiom “破茧成蝶 (pò jiǎn chéng dié)” better describes my transformation process (to transform from a caterpillar into a butterfly/metamorphosis) as a Chinese American woman. “破茧成蝶 (pò jiǎn chéng dié)” empowers me to transform into a stronger self after going through challenges, such as racial attacks. At a deeper level, I embrace the social justice values and strive for structural and transformational change. My personal and professional experiences dealing with interpersonal racism and coping with racial trauma have inspired me to continue the journey of broadening access and removing barriers beyond the university level, and also extend to societal and global initiatives.

I seek to understand how my ethnicity and cultural identity shape the way I view research and teaching. An example from my teaching a Multicultural Education course using a strength-

based approach is that I always try to link the course content to my students' identity, i.e., their life experiences, place of origin (such as rural vs. urban), religion, race/ethnicity, gender, age, socioeconomic status (class) etc. At a micro level, current instructional strategies often default to the dominant and privileged group while excluding marginalized students (Simone, 2012). Howe and Lisi (2020) stress the importance of cultural congruence in instruction. From a strengths-based perspective, cultural congruence is the process of aligning a learner's cultural integrity and the values of the learning environment (Jeffreys, 2015). Howe and Lisi (2020) state that when students recognize personal meaning in the instructional strategies, they will make connections between their past and new learning experiences. Students are more motivated to learn when teachers make learning relevant and share personal connections by using language, examples, and illustrations that students can identify from their own cultural backgrounds. For example, my strength-based approach is linked to my dissertation article titled *Cultural Congruity and Academic Confidence of American Indian Graduate Students in STEM: Peer Interactions, Mentor Cultural Support, and University Environment Fit* because I am aware that culturally relevant mentoring can help students have a higher level of cultural congruity and academic confidence.

Responsibility (责任)

As a Chinese American pursuing higher education, I am personally responsible for my family, the next generation, and society—and not just getting a degree. This is similar to the importance of family and education in Indigenous culture. Professionally, I teach multicultural education and want to help empower and mentor AI/AN students, who are an important minoritized population especially in Montana. Furthermore, I have a strong commitment to

social justice, seeking to advocate for and empower minoritized groups to see and use their strengths to successfully socialize in higher education. For instance, as a female Chinese immigrant, I have experienced and witnessed prejudice, racism, and discrimination. My voice is not always heard, motives are often challenged, and judgment often questioned. Thus, I understand how to help female participants and minoritized populations in my research feel that their opinions matter. Likewise, my socioeconomic background makes me aware that many students from low-income families need equitable support and resources from me as an educator. It is my responsibility as a researcher to hear participants' perspectives and stories. Also, my culturally attuned approach used in conjunction with participants' stories is an additional way to authentically represent myself as a Chinese American researcher and honor the cultural background of the participants.

My cultural experiences shape my research decisions, epistemologies, and research agendas. Initially, my research interest was on searching methods of teaching Chinese language, culture, and characters for international students. As I became interested in Technical Communication, I wanted to connect my personal and professional experience for language and culture with communication. This led me to my research publications on translation studies prior to starting my doctoral journey, such as *Chinese to English Translation: Identifying Problems and Providing Solutions* and *Human vs. Machine Translation Accuracy*. Though these publications are prior research and not part of my three-article dissertation, they have shaped how I approach my current research. For example, during the process of publishing my co-authored article *Coming Home to China: Margaret Woo's Story* with Dr. Pat Munday, I became interested in and sensitized to questions about assimilation, integration, and cultural pluralism. I

also served as a board member and communication director with the Mai Wah Society, a Butte-based 501c3 Chinese American historical organization that operates a museum. Butte was once the largest city in the northern Rocky Mountain region and has a rich Chinese history. Butte's Chinese immigrated from the Pearl River Delta near Guangzhou—the same area that I am from. This historical and social connection resonated with me as I came to learn more about Butte, and I experienced contemporary racism that was influenced by this historical perspective and passed down through Butte families for generations. Although Butte had a thriving Chinatown during its mining boom from the 1870s through the 1920s, the Chinese Exclusion Act of 1882 greatly restricted immigration as well as travel between the U.S. and China. Merchant families of moderate wealth had some additional privileges, but even with modest wealth this travel was not an easy process. U.S. immigration officials were often suspicious of Chinese travelers and immigration for wives and children involved rigorous interviews and sometimes prolonged detention (Brazill & Munday, 2022; Lee, 2003).

Reciprocity (互惠)

I practice reciprocity with participants by reflecting on how my research benefits their larger community and how I can motivate them to care. My multicultural experiences have shaped my research passion, desire to empower diverse graduate students, and dedication to building a more just society for underserved students. My goal is to become a professor where I can teach, mentor, research, and lead on two related issues: improving educational success for diverse students and helping dominant student groups practice multicultural inclusion. I will promote public scholarship and create educational opportunities in the community. For instance, the re-representations of my publications to different audiences who can benefit from my work

are evident through multimedia, practitioner-oriented articles, and the workshops/programs that I created as an instructional designer for the Center for Faculty Excellence.

To create a more inclusive environment and practice my personal goals, I will: (1) empower all students to exercise an equal voice in society; (2) help students understand how multiple identities shape their learning and can lead to improved success; and (3) promote well-being by exploring effective culturally aware mentoring relationships to support culturally diverse students and their cross-cultural socialization journey using a strength-based approach. This latter point connects to all the three articles for my dissertation, long-term research interests, and professional goals.

Self in Relation to Others: Strength-based Perspective

In this section, I will share how my background influences the way I relate to participants in my research and retell their stories. Hamdan (2009) states that “insider-outsider research has become one of the most heated areas of debate among immigrant scholars researching their own communities” (p. 377), and thus this kind of research requires self-awareness and reflexivity. Merriam et al., (2001) discuss negotiating insider-outsider status within and across cultural boundaries. My research participants’ intersectionality, such as race, class, gender, and other culturally diverse backgrounds influenced how they experience the world through their identities. Milner (2007) states that “researchers and participants in a study may interpret an experience or an interaction in very different ways, depending on the life worlds, phenomenologically speaking, of those conducting and involved in the research” (p. 396). Thus, I balanced my multiple identities and shared understanding with participants through designing, translating, and conducting research that were sensitive to their personal, professional, and cultural experiences.

Relationships (关系)

My multiple identities provide me with strengths to build trust and relationships with participants. I do this through communicating my motivation for my research agenda, which is to empower culturally diverse graduate students, including AI/AN and Chinese students. I built trusted relationships with participants through my social-constructionism lens to co-construct the ownership of stories and knowledge. Knowledge is textured by particularity and alternative possibilities (Clandinin, 2016). Furthermore, networked relationships “关系 (guān xì)” and communication in Chinese culture is circular and group-centered (not linear and one-to-one like Western relationships). Chinese prefer indirect ways of expressing their ideas in writing. They seldom make the subject clear at the beginning, but reaffirm the viewpoints in many different ways, leaving readers room for reflection (Brazill, 2016). In contrast, English academic writing is more straightforward and direct with an emphasis on logical reasoning and organization. The circular aspect also applies with oral speaking in Chinese culture, thus the data collection process, including conversational interviews and artifacts, should use narratives to encourage participants to share stories.

I am constantly learning to negotiate and balance the cross-cultural differences between my Chinese and American identity. Bourke (2014) notes that “the identities of researchers and participants have the potential to impact the research process. Identities come into play via our perceptions, not only of others, but of the ways in which we expect others will perceive us” (p. 3). Therefore, my identity impacts how I assume others will perceive me, how others actually perceive me, and how I perceive the participants. Bourke (2014) further explains that the researcher’s bias and assumptions will influence the participants while the participants’

responses will also influence the researcher's observations and interpretations. As researchers, we are never the same after engaging with others in a co-constructed way as we are inevitably changed by our research experiences. Moreover, I realize that my positionality not only affects how I engage and interact with the participants but also influences my research questions, research methodology, literature review, and data analysis process, including the coding themes that I selected and how I interpreted the data. I agree with Hamdan (2009) that the researcher's decision to include or exclude certain participants or questions reveals the researcher's values, background, and subjectivity. This is true as it reflects in how I selected interview and survey samples.

Respect (尊敬)

Research ethics go far beyond the minimal requirements of the Institutional Review Board (IRB) process, and include respect for participants' stories, attitudes, and beliefs. By embracing patience and cultural humility as I learn the stories of participants, I communicate respect for them and the academic community in that I want to ensure their story is authentic and transformative for participants and the intended audience. For example, knowing Chinese culture, I understood that participants preferred face-to-face interviews rather than online or phone calls. Also, they prefer to be interviewed using Chinese language instead of English. Notably, my Chinese participants strongly prefer using well-known Chinese last names as surnames instead of English names. I strongly believe that my role as a researcher is to respect participants' cultural values and to do research with and for people rather than on people. For instance, researchers need to be aware of the non-homogeneity of participants, such as geological diversity within China and tribal specificity among the AI/AN community. Another example is

that gift-giving is integral to Chinese and AI/AN culture and such gifts as gratitude offerings can be either tangible or intangible.

As an insider, my understanding of Chinese culture serves as a strength to help establish trust with participants and co-construct meanings. I have relied on my Chinese cultural heritage to connect with and to show respect for participants. This is an example of the Chinese word “面子 (miàn zi)”, a concept equivalent to “respect and trust”. Liu et al., (2019) point out that sharing food and tea is a common Chinese cultural norm to cement social solidarity in China and to accommodate the status differential between people. Such relationship building requires investing time, such as having meals or tea together. Moreover, these relationships are often long-term vs. short term, which makes repeated interviews possible for narrative inquiry.

Being an insider and knowing Chinese cultural norms, I understood that English was their second language and most Chinese people, even Chinese scholars of the English language, prefer to answer the questions in Chinese instead of English. Hence, when collecting data for my dissertation articles two and three, I translated the questions from English to Chinese for the Chinese international doctoral students. After collecting the data, I translated their narratives/stories back to English for the American audience. This is an example of how I rely on my bi/multilingualism as a strength to support my participants and connect with them in making meaning, building relationships, and sharing stories.

From Self to System: Neither China Doll nor Dragon Lady

Milner (2007) argues that “shifting from the self to the system allows researchers to work through the danger of rejecting the permanence and pervasiveness of race and racism because they, individually, do not see themselves as racists or contributors to injustice, inequity, or oppression” (p. 396). In addition, Bourke (2014) believes that “it is reasonable to expect that the researcher’s beliefs, political stance, cultural background (gender, race, class, socioeconomic status, and educational background) are important variables that may affect the research process” (p. 4). The contextual nature of race, class, and gender in my area of study is that I have become deeply passionate about social justice, identity, and intersectionality research. I learned this through my teaching of Multicultural Education, PhD courses I completed, and my research experience. Moreover, I rely on reflexivity rather than bracketing as a way to create a shared understanding with participants. My race/ethnicity has shaped my positionality as an independent young Chinese American woman living and studying in the U.S. Socially, institutionally, and historically, students under inquiry are very different and distinguished by diverse languages and cultures. My literature review revealed information about the communities and people under inquiry through various lenses. For instance, Chinese culture values harmony while struggles framed by conflict and debate are central to American culture. This is seen in the classroom and in research practices (Nisbett, 2004).

My dissertation research paradigm marshals both the qualitative inquiry and quantitative methodological approaches to investigate cross-cultural socialization and culturally attuned mentoring relationships that increase academic confidence and cultural congruity. Most importantly, in my dissertation article two and three, I specifically focused on Chinese students

from a qualitative approach because most studies group all Asians together. I wanted to honor the within-group diversity of Asian and specifically Chinese international doctoral students in my dissertation research. Moreover, a limitation of quantitative studies is the lack of diversity in the demographics coding, with “race” often dummy coded as “White” and “Other”. For instance, a recent study published by Suh and Luthar (2020) presented a binary coding of the important demographic variable “race” and this reductive approach to coding is problematic. I am also concerned about the practical significance and implications of these findings to other sub-groups, such as Hispanic, Latinx, African American, AI/AN, and non-Chinese Asians. Moreover, collapsing all the racial groups to White vs. Non-White, as with a very large sample observation of 35,718 (Suh & Luthar, 2020), could be an ethical concern. If there are enough people in each racial group, is it our ethical responsibility to differentiate “race” by subgroups in ways that improve our understanding of racial diversity? This is also why it is important to study AI/AN students and, in my dissertation article one, why I used critical quantitative research methodology lenses (Stage, 2007; Stage & Wells, 2014; Wells & Stage, 2015). Moreover, as America becomes more multicultural, individuals who belong to multi-racial groups will challenge researchers to think beyond simple racial categories.

Chen (2014) states that cultural identity refers to a sense of belonging to a particular group based on various cultural categories, including nationality, ethnicity, race, gender, and religion. I am self-identified as a Chinese American woman. As a minoritized individual living in the Western U.S. (Montana) where the majority of the population are White, I have experienced many racist incidents. Unfortunately, the U.S. popular media portrays common stereotypes of Asian females as either “submissive and quiet” or, at the opposite extreme, “aggressive”. Lee

(2018) characterizes Hollywood's binary archetypal representations of East Asian women either as submissive, obedient, delicate, and overly emotional "China Doll" or threatening, aggressive, and cold "Dragon Lady". For example, Lucy Liu was known for "playing the role of the vicious and ill-mannered Ling Woo in the television series *Ally McBeal*" (1998–2002) and from her role in the film *Charlie's Angels* (2000) (Danico, 2014; Lamphier & Welch, 2017; Luther, 2017). In my favorite modern TV show, *Fresh off the Boat* (2015–Present), Constance Wu plays the character Jessica Huang, who is depicted as an overbearing and aggressive "Dragon Lady". In contrast, films such as *Old San Francisco* (1927) and *The World of Susie Wong* (1959) depicted the submissive stereotype of Asian American females (Gallagher & Lippard, 2014; Jones & Brazzel, 2012; Le Espiritu, 2008).

In her Ted Talk, Chimamanda (2009) shares many experiences with people who label her as a "single story". An example is when she talked about how her college roommate felt pity for her because she was from Africa. "Single stories" portray and essentialize people in one way. They create and reinforce stereotypes that emphasize the difference between a minoritized individual and dominant White culture. I do not fit either the "China Doll" or "Dragon Lady" label, both of which are single stories built on assumptions derived from stereotypes. For instance, as an assertive and confident individual, I have been racially attacked and accused of being an "aggressive Asian woman".

These stereotypes, acted out by the dominant group, caused racial trauma and impacted my identity during the time I studied and worked in Montana. My strong grit, independence, and friendly character were labeled as "aggressive", one of the extremes of the Asian American female stereotypes. This label was then used to exclude, marginalize, and even attack me racially

by some White Americans. I tried to use my strengths (i.e., strong work ethic and a desire for social change) to overcome the challenges of being a Chinese woman in a small Montana town. To protect myself from being harmed, I tried to be more reserved and less friendly with people who might be biased against my Chinese identity. Other Chinese American women seem to understand my personal experience and they have described similar experiences. Often, I feel like a train constrained to a track by my Chinese identity, vs. Americans who are like SUVs. I feel that I must balance the stereotypes that lie to either side of the track. An SUV, on the other hand, would be able to swerve and turn, whereas I cannot. That said, systemic and organizational barriers and structures shape peoples' experiences, both locally and globally. Even if many Chinese immigrant students wanted to integrate into American society, they were prevented from doing so historically by a dominant culture that institutionalized racism and made acceptance difficult or even illegal (Danico, 2014; Jones, 2000; Lew-Williams, 2018). Today, it is important to examine how higher education can be more culturally attuned to people from other ethnic groups. Sadly, the current socio-political climate, Xenophobia, and anti-Asian hate crimes in post-Trump America have caused racial traumas for many Asians and especially for Chinese students (Hufana, 2021).

Reflexivity (反思)

Cross-cultural learning occurred as I made meaning with my participants and the people with whom I interacted throughout my research. In this sense, I use reflexivity to bridge meaning-making, and this has helped me to better appreciate and understand cross-cultural learning. Hamdan (2009) states that “Reflexivity is researching myself and reflecting on my personal beliefs and values both as a researcher and as a member of the researched group” (p.

378). Throughout my three-article dissertation, I used inter-subjective reflections (researchers and participants co-involved in the meaning-making process) to engage in reflexivity (Major & Savin-Baden, 2013). Moreover, Whitaker and Atkinson (2021) articulated varieties of reflexivity in the social sciences, such as epistemic reflexivity, disciplinary reflexivity, and methodological reflexivity. Whitaker and Atkinson (2021) further argued that research reflexivity begins by making a distinction between reflection and reflexivity. The latter acknowledges the intellectual craftwork that goes into the production of knowledge (Whitaker & Atkinson, 2021). Throughout this chapter, reflexivity inspires me to articulate how my background, worldviews, experiences, and assumptions interact with the research process. My positionality represents a space in which objectivism and subjectivism meet (Bourke, 2014). Therefore, it is vital to be conscious of articulating and exploring how my identities, values, and experiences might impact my role as a social scientist.

Conclusion

I am a Chinese American woman scholar who strives to make positive cultural changes in the U.S. higher education system. My personal biography and the theory, method, analysis, ontology, and epistemology of educational research have guided my research agenda. My educational background, cultural identity, and professional experiences have shaped who I am and how I view the world through my cross-cultural lens. Being self-reflexive helps me to be a thoughtful researcher and helps the audience understand my research methodology, analysis, and data interpretation. Researchers are shaped by the co-construction of knowledge and meaning making. Therefore, my research shaped my ability to integrate teaching, research, and service as well as bridge the gap between theory and practice.

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CHAPTER THREE

CULTURAL CONGRUITY AND ACADEMIC CONFIDENCE OF AMERICAN INDIAN
GRADUATE STUDENTS IN STEM: PEER INTERACTIONS, MENTOR CULTURAL
SUPPORT, AND UNIVERSITY ENVIRONMENT FIT

Contribution of Authors and Co-Authors

Manuscript in Chapter Three

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**Cultural Congruity and Academic Confidence of American Indian Graduate Students
in STEM: Peer Interactions, Mentor Cultural Support, and University Environment Fit**

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Abstract

This quantitative study aimed to understand processes germane to Indigenous graduate students' transcultural socialization in Science, Engineering, Technology, and Math fields (STEM). We theorized that transculturation and "wayfinding" are complementary socialization processes to promote healthy socialization of Indigenous graduate students in STEM. We hypothesized that socialization components including peer interactions, mentor's cultural support, and university environment fit would facilitate academic confidence and cultural congruity. We conducted an exploratory study using a sample of 44 Indigenous STEM graduate students from 12 American public research universities. Our results found elevated levels of cultural congruity among those students who reported more favorable peer interactions, but the simultaneous experiences of mentor's cultural support and university environment fit did not reveal such an influence. Students reported greater levels of academic confidence in the presence of mentor's cultural support and university environment fit but not for peer influence. We situated these findings within prior research and recommendations for programs and practices where universities, peers, and mentors can provide cultural support, inspire academic confidence, and further enhance well-being through honoring the cultural strengths of Indigenous students.

Keywords: American Indian, Indigenous, STEM, Cultural Congruity, Academic Confidence

Introduction

In the last ten years, the number of master's degrees across all fields awarded to Indigenous¹ graduate students decreased by 8% from 3,324 to 3,084 recipients in 2017-18 (National Science Foundation, National Center for Science and Engineering Statistics, 2019). Accordingly, data from the Survey of Earned Doctorates showed that among the 46,632 STEM doctorates awarded in 2019, only 0.1% were granted to American Indian and Alaska Native (AI/AN) students (National Science Foundation, National Center for Science and Engineering Statistics, 2019). Educational attainment disparity was most notable in Science, Engineering, Technology, and Math fields (STEM). Consequently, the highest percentage of Indigenous doctorate recipients in 2018 were in non-STEM fields, such as Education and Law (National Science Board, National Science Foundation, 2019) because Indigenous graduate students typically choose other fields over STEM (CHiXapkaid, 2012). Higher education scholars and policy researchers claim STEM education access and attainment is also a critical socio-economic justice issue (Baillie et al., 2011).

Indeed, the U.S. Bureau of Labor Statistics projects graduate education and professional certification programs will become increasingly important for economic growth over the next two decades (Torpey, 2019). The U.S. Bureau of Labor Statistics reported that careers requiring a minimum of a master's degree will increase by 13.7% and those requiring a doctoral degree by 9.0% between 2018-2028. Comparatively, careers requiring a minimum of a bachelor's degree will only increase 7.7% over the same time period (Torpey, 2019). Further, occupations in

¹ We used the term AI/AN because it is commonly used by NSF and it is how students self-identified themselves in the survey. AI/AN is also commonly used by other authors. We also use the term "Indigenous" to refer to the AI/AN population and to acknowledge the political, cultural, and geographical identities of American Indian and Alaskan Native people in the United States (Bird, 1999; Grande et al., 2015).

STEM are expected to increase by 9 million between 2012 and 2022 (Fayer et al., 2017). This is a 13% growth compared to the 11% growth for other fast-growing occupations. Over 99% of STEM occupations require some type of postsecondary education for entry compared to 36% of overall employment (Fayer et al., 2017), and many STEM careers require advanced education to keep pace with technological changes and new job tasks (Deming & Noray, 2018). These data highlight the value of earning a STEM degree, especially at the graduate level. The advantages of a career in STEM include higher initial salary, a range of career opportunities, diverse work environments (Noonan, 2017), and important social impacts (Ramirez, 2020).

Still, Indigenous students remain underrepresented in U.S. postsecondary education, especially at the graduate level in STEM fields. Prior research has suggested that STEM disciplinary culture in graduate school may be inconsistent with Indigenous cultural values (Smith et al., 2014). Traditionally, STEM academic culture has been characterized as individualistic and competitive with well-established cultural norms and academic expectations (Page-Reeves et al., 2017). As Indigenous graduate students enter STEM disciplines, researchers have noted additional stressors such as feelings of isolation on campus and the loss of cultural belonging (Coble, 2019).

Recent discourse on the involvement of Indigenous graduate students in STEM has focused on the ways in which the university and faculty should intentionally establish places and relationships that create culturally congruent spaces for Indigenous STEM graduate students (Windchief & Brown, 2017; Windchief et al., 2018). These spaces are described as places where healthy socialization occurs. Spaces where mentors' take interest in Indigenous students' cultural backgrounds, relationships are reciprocal, and co-learning and cultural learning occur (Grande et al., 2015; Windchief & Brown, 2017; Windchief et al., 2018). Reformers also advocate that

institutions collaborate with Indigenous students to create culturally responsive places where Indigenous students feel a sense of belonging (Heavy Runner-Rioux et al., 2018). The advent of these spaces provides a place where Indigenous students embrace their identities and develop knowledge and skills to productively socialize (Huffman, 2001, 2013) and transform as STEM professionals (Page-Reeves et al., 2017). Collectively, these elements represent Native spaces in STEM (Page-Reeves, et al., 2017) and explain the mechanisms in which important cultural exchanges occur as part of the socialization process. One new important line of inquiry is to understand how institutions, faculty, and peers engage in culturally responsive practices to influence Indigenous STEM graduate student experiences as part of the socialization process.

To this end, our quantitative study examined Indigenous students' experiences of key faculty, peer, and institutional relationships that are part of their socialization process in STEM at 12 non-Native Colleges and Universities (NNCUs) (Oxendine, 2015; Shotton et al., 2013). We built on prior research that showed these agents play a pivotal role in the socialization experiences of Indigenous students (Akee & Yazzie-Mintz, 2011) and important psycho-social and cognitive development (Flores-Scott & Nerad, 2012; Le & Gardner, 2010). Peers and faculty provide democratic/horizontal and vertical relationships, respectively, that are both necessary for socialization processes (Flores-Scott & Nerad, 2012). At the institutional level, a lack of support has been found as significant risk factors for Indigenous students' interruption in their educational pathway (Akee & Yazzie-Mintz, 2011). Our study added a decidedly cultural component to understanding the twin socialization processes of academic confidence and cultural congruity. Specifically, we examined whether these two processes were a function of Indigenous STEM graduate students' perceptions of the extent to which their mentors, peers, and university expressed interest of and value for their cultural heritage.

Theoretical Approach

More recent perspectives on socialization challenge the typical congruence and assimilation perspective and advocates for a critical and strength-based approach that recognizes the values, cultural wealth, and life experiences that minoritized bring with them to their graduate education (Garcia et al., 2020; Griffin, et al. 2020), which support “intellectual individuality” (Antony & Schaps, 2021). The strength-based perspectives on graduate student socialization are especially relevant to Indigenous graduate students who may come from cultures that are different from and even at odds with the culture of STEM (Waterman & Lindley, 2013). Indeed, Indigenous scholars advocate for developing culturally responsive mentoring through an Indigenous Mentoring Program that includes faculty cultural training, building relationships, peer-mentoring, and cultural humility (Windchief et al., 2018).

In a study of Indigenous STEM professionals, Page-Reeves et al. (2019) referred to the process of “wayfinding” where students and professionals relied on their strengths and culture to “meld different aspects” and experiences through “dynamic and recursive changes in perspective” thus enabling them to create space within their STEM education (p. 178). This process of “wayfinding” is similar to Huffman’s (2001, 2013) Transculturation Hypothesis for how undergraduate Indigenous students find strength in their culture and use it as an emotional anchor to navigate and persist in their education. In its essence, the Transcultural Hypothesis emphasizes that Indigenous students who maintain a strong ethnic identity will develop knowledge and skills, which they use to relate to the academic culture. Their reliance on traditionalism provides an emotional anchor, which serves as a form of cultural integrity that leads to self-confidence for healthy socialization to education at NNCUs.

Huffman's theory is a psycho-social development theory with a four-stage transculturation process including initial alienation, self-discovery, realignment, and participation. The theory was originally conceived at the undergraduate level for Indigenous students. These students reported having a strong belief in their Native identity, which allowed them to overcome challenges within the institution and to grow personally and academically. Of import is that Indigenous students recognized that they had succeeded because they "were American Indians and not trying to be anything else" (Huffman, 2001, p. 20). This Native identity was their emotional anchor grounded in their cultural heritage. These transculturation processes such as self-discovery, realignment, and participation are similar to "wayfinding" as described by Page-Reeves et al. (2019). That is, Indigenous STEM professionals through a self-discovery process were able to align their past and current experiences, cultural connections (reconnections), and multidimensional perspectives to understand and develop their identities as Indigenous STEM professionals.

Transcultural and "wayfinding" provide a strength-based perspective for how Indigenous students maintain faith in their cultural heritage through the socialization process to STEM. Both socialization processes are iterative and recursive and rely on relationships and experiences with peers, mentors, and the institutional context for healthy socialization to occur. Aspects of the process that have not been investigated are the ways peers, mentors, and the institution can help facilitate transcultural and wayfinding socialization through culturally responsive practices. Our study relied on intentional ways in which peers, mentors, and the institution expressed cultural interests, respect, and learning from and about Indigenous students' cultural heritage. We assumed that peers, mentors, and the institution who actively and authentically communicate

verbally and symbolically respect for Indigenous students' cultural backgrounds created spaces

where Indigenous STEM graduate students felt valued, more self-assuredness, and a sense of place within NNCUs.

Figure 1 integrates the Transcultural Hypothesis and theoretically aligns the self-discovery and realignment phases with the three focal variables in this study—peers, mentors, and university environment. The theoretical model took a strength-based approach by examining the positive socialization experiences of Indigenous students that lead to greater academic confidence and culturally connectedness (Gloria et al., 2005).

The theoretical stages of self-discovery and realignment of the transculturation process are based on three assumptions (Huffman, 2001, 2013, 2018). One, it is assumed that Indigenous graduate students experience self-discovery and realignment as they socialize to STEM graduate education and that Indigenous students' educational participation, development, and persistence occurs during these processes (Heavy Runner-Rioux et al., 2018). Two, students in these two stages report greater academic confidence, strong cultural identity, and knowledge and skills needed to participate in different cultural settings and reflectively engage with different aspects of their identities through the self-discovery process. Three, transculturation is not solely dependent on the student. Peers, mentors, and the institutional context have an ethical and vital role in honoring the strengths and values that Indigenous students bring with them. That is, these vital socializing relationships create a Native space in which students can thoughtfully reflect on their cultural assets, feel as if they belong, and develop confidence as STEM graduate students.

The Present Study

This study examined how Indigenous STEM graduate students' perceptions of cultural support from their peers, mentors, and institution related to perceptions of academic confidence and cultural congruity. Indigenous students whose mentors and peers show greater interest in

their cultural backgrounds may experience a greater cultural congruity as part of their socialization (Heavy Runner-Rioux et al., 2018). Similarly, Indigenous scholars have found that faculty and the institutions play an influential role for Indigenous students' well-being, academic confidence, and advancement to the graduate level (Chow-Garcia, 2016).

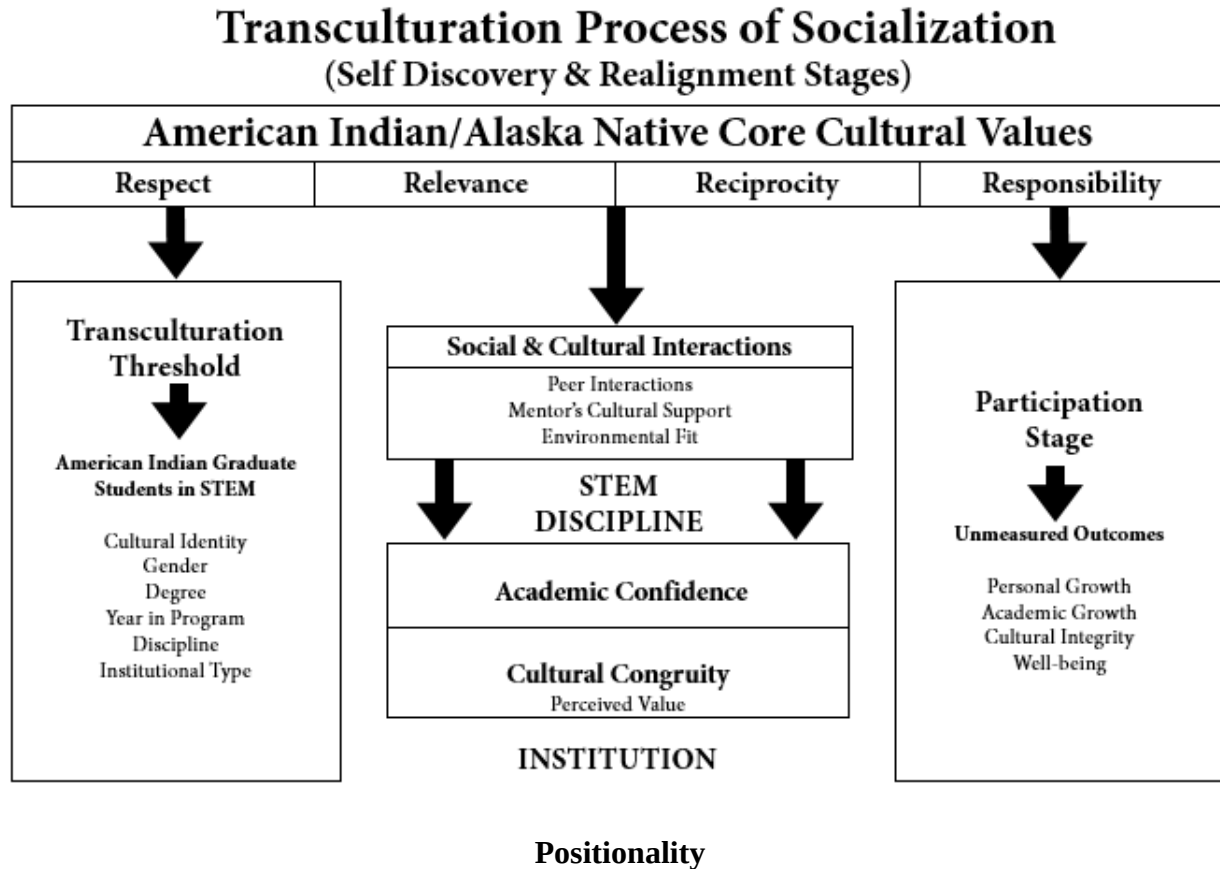
In this study, cultural congruity was the extent to which individuals perceived that their culture of origin was accepted and valued in the new educational culture (Gloria et al., 2005), which is positively associated with college persistence (Heavy Runner-Rioux et al., 2018; Windchief & Brown, 2017). We recognized and agreed with the critiques to reframe socialization away from the congruence assimilation discourse as noted previously. Yet, this quantitative measure of cultural congruity allowed us to understand how Indigenous students perceived that their culture was valued by the faculty and institution. Academic confidence was defined as a students' strong belief in their success within an academic field (Pascarella & Terenzini, 1980; Sander & Sanders, 2006). Studies have shown that high cultural congruity and academic confidence were positively associated with persistence, student success, and well-being for students of color (Gloria & Robinson Kurpius, 1996, 2001; Keith et al., 2016), which are all important qualities for healthy socialization.

Hypotheses

Hypothesis 1: Indigenous STEM graduate students who have positive culturally attuned socialization experiences with peers, mentors and institution report higher levels of cultural congruity.

Hypothesis 2: Indigenous STEM graduate students who have positive cultural attuned socialization experiences with peers, mentor, and institution report greater levels of academic confidence.

Figure 1
Transculturation Process of Socialization



We positioned ourselves as non-Indigenous researchers and had a deep desire to learn to walk together with our Indigenous communities “in a good way” (Grande et al., 2015, p. 120). We took the responsibility of listening and learning from and with our Indigenous scholars and colleagues to better understand Indigenous knowledge systems, research paradigms, cultural values, and worldviews (Kirkness & Barnhardt, 1991). Our research was grounded in Kirkness and Barnhardt (1991) "Four Rs" of respect, relevance, reciprocity, and responsibility as represented in our theoretical framework, critical quantitative method, and public dissemination of our work. Members of our research team have long-standing relationships with Indigenous programs, communities, scholars, and students. We are teachers and learners who learn with and

from our Indigenous students, many of whom have graciously shared their insights and experiences in socializing to NNCUs. We advocate for a strength-based approach by recognizing the incredible opportunities and assets that our Indigenous partners bring to higher education including but not limited to intellectual, social, and cultural diversity.

Method

This survey-based quantitative study used a critical quantitative method to examine AI/AN graduate students' transcultural socialization experiences in STEM (Stage & Wells, 2014). This study was part of a larger research project funded by the National Science Foundation that was designed to understand the socialization experiences of graduate students in STEM. As part of this process, a survey was sent to all graduate students in STEM at 12 doctoral-granting public universities in 2016. The 12 participating institutions were predominantly White, located in the Western and Mid-Western regions of the United States, and met three criteria: (1) doctoral degree granting, (2) research intensive, and (3) well-developed support services for AI/AN students. The term "well-developed support services" meant that these 12 institutions were included in the list of "Top 200 Colleges for Native Americans" published by American Indian Science and Engineering Society (AISES, 2015). These selected institutions are specifically "geared toward Indigenous students" with "strong support systems from admission to graduation." These 12 institutions included six with Carnegie's rating of "very high research activity" (R1) and six with "high research activity" (R2).

Forty-five AI/AN graduate students responded to the survey from the 12 universities. Our analysis relied on 44 AI/AN STEM students who had complete data on all the study variables. Thus, there were no missing data among this analytical sample. Statistically, a sample of 44

students is considered small in absolute terms. However, the overall institutional response rate

for AI/AN students was 21% across all universities. Following Ellis (2010) we conducted a post hoc power analysis using G*Power with seven predictors, an alpha of 0.05, our sample size of 44, and a Cohen's effect size (f^2) of 0.35. We chose 0.35 as it represented a "large" effect and therefore a more conservative power analysis. The results returned a power of 0.74 suggesting that our sample size had significant power to detect this effect size or larger. To supplement this analysis, we followed the suggestion by Colegrave and Ruxton (2003) to include confidence intervals to further gauge effect sizes.

Finally, beyond statistical tests, our sample and analyses of 44 AI/AN graduate students provided solid practical significance for graduate education because they (a) came from 12 different institutions with varying settings, cultures, and resources, (b) were in both master's and doctoral degree programs across a wide range of STEM fields, (c) had varying demographic and educational characteristics, and (d) had full data on an array of important substantive measures for educational success. This suggests that our findings on these 44 AI/AN students will extend beyond a specific institution, STEM field, or sub-set of AI/AN graduate students.

The survey instrument contained questions on student demographics, background characteristics, and psychosocial constructs. The two outcome variables were cultural congruity and academic confidence, and the three predictor variables were peer interactions, mentor's cultural support, and university environment fit—all important for student socialization. These variables were measured on a Likert scale and comprised multiple items to form indices. Indices were generated from factor analysis and Cronbach's alpha were calculated for each index. We also used an established set of controls: strength of cultural identity, gender, degree, and Biglan STEM discipline (Akee & Yazzie-Mintz, 2011; Biglan, 1973; Huffman, 2001, 2013).

Instrumentation

The Graduate Student Experience survey was designed to investigate multiple constructs related to sociocultural features of graduate school often overlooked at the graduate level. The correlations and descriptive statistics of the key variables are shown in Table 1.

Table 1

Zero-Order Correlations and Descriptive Statistics for Key Study Variables: American Indian Graduate Students in STEM (n=44)

Variable	Variable					<i>M</i>	<i>SD</i>
	CCI	ACI	PII	MSCI	UEFI		
CCI	—					5.08	1.21
ACI	.55*	—				3.88	0.92
PII	.64*	.70*	—			3.75	0.73
MSCI	.53*	.80*	.57*	—		3.88	0.93
UEFI	.68*	.74*	.65*	.54*	—	5.45	1.43

Note. STEM = Science, Engineering, Technology, and Math fields; CCI = Cultural Congruity Index; ACI = Academic Confidence Index; PII = Peer Interactions Index; MSCI = Mentor's Cultural Support Index; UEFI = University Environment Fit Index.

* $p < .05$.

Outcome: Cultural Congruity Index

The Cultural Congruity Index was a modification of the Cultural Congruity Scale used by Gloria and Robinson Kurpius (1996). The index used 9 of the original 13 items and asked about a student's perceived value of their culture in a new environment and the alignment between this new culture and culture of origin (e.g., "I feel as if I belong on this campus." and "My personal values are in conflict with what is expected at school."). The items were measured using a 7-point scale where 1 = Not at All True and 7 = Very True and five items were reverse coded so higher scores indicated increased sense of cultural congruity and that students could leverage their culture within their STEM academic and social experiences. The index was summed and

averaged to retain the original 1 – 7 scale where higher scores indicated greater Cultural Congruity. The index had a high level of reliability ($\alpha = 0.86$), which is higher than previous studies found for the Cultural Congruity Index among Native American undergraduates ($\alpha = 0.74$; Chee et al., 2019).

Outcome: Academic Confidence Index

Academic Confidence Index measured a student's strong belief of success within an academic field and was a modification of the Academic and Intellectual Development Scale by Pascarella and Terenzini (1980) to measure students' intellectual development at the undergraduate level. The index used 5 of the original 7 items and included statements such as "I am satisfied with the extent of my intellectual development since enrolling in the university," and "My courses this year have been intellectually stimulating." The items were measured with a 5-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. The index was summed and averaged to retain the original 1 – 5 scale where higher scores indicated greater Academic Confidence and the index had a high degree of reliability ($\alpha = 0.89$). This degree of reliability was higher than previous studies on the Academic Confidence Index for undergraduates ($\alpha = 0.74$; Pascarella & Terenzini, 1980).

Predictor: Peer Interactions Index

Peer Interactions Index measured the extent to which students engaged with and found support from their peers in social, cultural, and academic interactions and was a modification of the Peer-Group Interactions Scale developed by Pascarella and Terenzini (1980). The index used all 7 measures from the original scale. The 7-items ($\alpha = 0.80$) were measured based on a 5-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree and included statements such as "Since coming to the university I have developed close personal relationships with other

students,” and “Students would be willing to listen to me and help if I had personal problems.” With one response reverse coded, the index was summed and averaged to retain the original 1 – 5 scale where higher scores indicated greater levels of interactions with their peers. Previous studies found slightly higher reliability and validity for the Peer Interactions Index among freshman undergraduates ($\alpha = 0.84$; Pascarella & Terenzini, 1980).

Predictor: Mentor’s Cultural Support Index

The 5-item Mentor’s Cultural Support Index was developed to tap psycho-sociocultural aspects of the mentoring relationship. Our research team developed three new items informed by research on the role of family and culture for AI/AN persistence in higher education (Johnson et al., 2018; Museus & Quaye, 2009; Guillory & Wolverton, 2008). The items that measured Mentor’s Cultural Support included the statements “Is interested in my culture,” “Is tolerant about any cultural differences between us,” and “Appreciates cultural diversity.” (Guillory & Wolverton, 2008; Museus & Quaye, 2009; Shotton et al., 2007). The two other items were modified from an item on the Career WISE survey (Primé et al., 2015). This WISE item measured advisor social support with, “My advisor respects my home, family and personal responsibilities.” We divided this item into two new items: “My advisor is interested in me beyond my academic role,” and “My advisor is friendly toward my family.” All five statements were measured by a 5-point Likert scale where 1 = Strongly Disagree and 5 = Strongly Agree. We summed and averaged the index to retain the original 1 – 5 scale where higher scores represented greater levels of cultural support from their mentors. The index had a high level of reliability ($\alpha = 0.93$), which surpassed the first study to use the Mentor’s Cultural Support index for exploring the experiences of STEM International graduate students ($\alpha = 0.90$; Johnson, 2019).

Predictor: University Environment Fit Index

The University Environment Fit Index measured the degree to which students felt welcomed and comfortable within their educational setting and was a modification of the University Environment Scale initially developed by Gloria and Robinson Kurpius (1996) to examine Hispanic, Latina/o, and Chicana/o undergraduate experiences in college. Our index used 6 of the original 14 items and was comprised of statements including “The university seems to value minority students,” and “I feel comfortable in the university environment.” The items were measured using a 7-point scale, where 1 = Not at All True and 7 = Very True and three items were reverse coded to represent a scale indicating greater fit. The index was summed and averaged to retain the original 1 – 7 scale where higher scores represented increased perception of university environment fit and the index had high reliability ($\alpha = 0.91$). Our high reliability again surpassed prior studies for University Environment Fit ($\alpha = 0.84$; Gloria & Kurpius, 1996).

Control Variables and Sample Demographics

The primary demographic variable of gender was dummy coded as 0 = male and 1 = female. There were no gender options beyond the gender binary question offered in the survey. Additional control variables included (a) graduate degree level that was dummy coded as 0 = masters and 1 = doctoral; (b) a “strength of cultural identity” and included two summed and averaged Likert scale questions (1 = Not at all Important and 5 = Extremely Important): “being identified as a member of the community where I grew up” and “being identified as a member of the family I grew up with;” (c) the student’s year in school was a 6-category variable measured as 1 = first year to 6 = 6 or more years; (d) the 12 institutions were measured using the Basic Carnegie Classification: six institutions were R1: Doctoral Universities – Highest Research

Activity (coded “1”) and six institutions were R2: Doctoral Universities – Higher Research

Activity (coded “0”); and (e) STEM discipline was dummy coded into Biglan’s four disciplinary “Hard” categories: (1) Pure Life, Hard (e.g., Biology, Physiology), (2) Pure Nonlife, Hard (e.g., Mathematics, Chemistry), (3) Applied Life, Hard (e.g., Agriculture, Medicine), and (4) Applied Nonlife, Hard (e.g., all Engineering fields, Computer Science) (Biglan, 1973).

For relevancy of our study, we chose the Biglan classification for the following reason. While the original classification system generally distinguished between content, curricula, and teaching methods used by faculty in disparate STEM fields, Nelson Laird et al. (2008) argued that the classification can further identify groupings of fields and sub-fields that had similar approaches to teaching, socialization, and learning as well as culture. Through these dimensions, students learn what is appropriate, expected, and accepted in terms of their behavior in the field.

Among the 44 AI/AN graduate students, about 45% were males, 59% were in doctoral programs, the average year in a school was just below three years, and the modal Biglan category was Pure Life, Hard (32%) followed by Pure Nonlife, Hard and Applied Nonlife, Hard (both at 28%). Most of the students attended an R2 institution (59%). As for the Cultural Identity Index, the average response was 3.92 on a 1 – 5 scale indicating a high sense of cultural identity.

Indices Validity

The validity of our key study variables was confirmed by research from the original developers of the indices. For our Cultural Congruity and University Environment variables, the original study with 454 Chicano/a undergraduates at two large southwestern universities by Gloria and Robinson Kurpius (1996) found predictive validity for their similar Cultural Congruity Scale (CCS) and University Environment Scale (UES) in regression analyses analyzing their associations with academic persistence decisions. More recently, Gloria et al.

(2015) provided evidence of the construct and criterion-related validity of CCS and UES among

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110 Chicana/o community college students. They established that CCS and UES demonstrated criterion-related validity through regression-based predictions and convergent and discriminant validity through correlations with similar constructs. Lastly, Chee et al. (2019) also found predictive validity for CCS as it was a significant predictor of lower academic stress among 158 Native American undergraduates.

For our Academic Confidence and Peer Interactions indices, Pascarella and Terenzini (1980) provided evidence of predictive and discriminant validity for their similar scales through correlation and regression analyses predicating persistence between the freshman and sophomore years among 763 undergraduates at Syracuse University. Unfortunately, the racial/ethnic variable was coded only as “minority” or “nonminority” and percentages of each were not provided. Our Mentor’s Cultural Support Index was the only variable created by the research team among our five key variables. Because of this, we can determine only tangential support for convergent and criterion validity as was found by Johnson (2019) among 953 international students enrolled in STEM graduate programs, across 12 universities where 66.4% were Asian/Pacific Islander, 3.4% were Black/African American, 9.2% were White Caucasian, 8.3% were Hispanic/Latino/a, 6.5% were Arab/Middle Eastern, and 6.2% were Other. Primé et al. (2015) used confirmatory factor analysis to establish the construct validity of the Career WISE scale. Among the 293 self-identified women in the STEM doctoral programs sample, 0.3% self-identified as Native American, 27.2% as Asian, 3.4% as African American, 59.8% as White Caucasian and 9.3 % as Multi-ethnic (Primé et al., 2015). Their work informed our development of the Mentor’s Cultural Support Index.

As our indices were modifications of the original scales, our results within this paper provided further support for the validity of our key variables among our analytical sample. First,

for all five of our study variables we demonstrated the internal reliabilities through high alpha coefficients as detailed above. Second, Cole (1987) suggested that correlations less than 1.0 among the factors indicate discriminant validity. As shown in Table 1, the correlation for the outcome variables of CCI and ACI was 0.55 and the correlations among the predictor variables ranged from 0.54 to 0.80. A 95% confidence interval for all correlations found that each correlation differed significantly from 1.0. Therefore, discriminant validity was found and that our outcome and predictor variables were each measuring a distinct characteristic of our analytical sample. Third, the regression results (see Tables 2 and 3) provided evidence of predictive validity for our indices of Peer Interactions, Mentor's Cultural Support, and University Environment Fit.

Analytical Strategies

We tested the associations between our focal and outcome variables with a two-pronged approach. First, we calculated zero-order correlations (Table 1) between the five key study variables. The correlation coefficients established the basic associations in absence of the influence of other focal and control variables. Second, we used ordinary least squares regression (OLS) with a block-model building approach to estimate the relationships between the focal predictor variables and the outcome variables. Our subsample sizes at each institution prevented the use of a 2-level hierarchical linear model. As suggested by Kelley and Holden (2013) for educational research, the first block of variables included the control variables, represented the “simple” model (i.e., Model 1), and were important to control for as they may explain a large portion of variance. The second “richer” model (i.e., Model 2) simultaneously added the block of focal variables to the control variables to estimate the net associations. By modeling the focal variables simultaneously, we produced more conservative net estimates of the association

between the focal indices and the outcomes (Klago et al., 2015). The changes in adjusted R-squared and F-test between the models determined if the addition of the focal variables added explained variance above and beyond the control variables (Kelley & Holden, 2013).

A series of regression diagnostics were performed using the *regcheck* function in Stata to test the assumptions of OLS. The *regcheck* included linearity, normality of residuals, multicollinearity, homoscedasticity, and influential observations. The results returned no violations for cultural congruity and revealed one violation of heteroskedasticity for academic confidence research outcome. The results also showed the absence of multicollinearity between predictors as indicated by variation inflation factors (VIF). VIF values greater than 5 would suggest effects of multicollinearity in the model and be cause for concern (Mehmetoglu & Jakobsen, 2016). All predictors in our regression model had VIFs less than 3.

To adjust for the heteroskedasticity violation, we used robust regression to produce robust standard errors. Robust standard errors were used in OLS for the presence of heteroskedasticity, to produce unbiased standard errors and p-values, and made our OLS equation the best linear unbiased estimator (Mehmetoglu & Jakobsen, 2016). Also, with a sample of 44 students, the “richer” OLS model satisfies the minimum threshold of two subjects-per-variable to further produce unbiased and reliable coefficients, standard errors, and R-squared (Austin & Steyerberg, 2015). According to Wasserstein et al. (2019) researchers should interpret the p-value in light of sample size and meaningful effect size. Therefore, we reported the actual p-values as well as 95% confidence interval to allow readers to interpret the significance and the results’ relevancy to their research.

Results

The correlations and descriptive data are displayed in Table 1. On average, students reported positive responses on the two outcome variables. For CCI, students reported a mean of 5.08 that placed them at about the 73rd-percentile on the seven-point scale ($M = 5.08$; $SD = 1.21$). For academic confidence, the mean of 3.88 placed them at about the 78th percentile on the five-point scale ($M = 3.88$; $SD = 0.92$). For peer interactions ($M = 3.75$; $SD = 0.73$) and mentor's cultural support ($M = 3.88$; $SD = 0.93$) the means located the students at about the 75th percentile for both. Lastly, with a mean of 5.45 for university environment fit, the students collectively placed at the 78th percentile on the 7-point.

The results for the zero-order correlations show significant associations between all of the key study variables. For the focal predictor variables and outcome variables, the correlation coefficients ranged from 0.53 ($p < .05$) between mentor cultural support and cultural congruity to 0.80 ($p < .05$) between mentor cultural support and academic confidence. Between the three focal variables, the correlations were 0.54, 0.57, and 0.65 ($p < .05$). While these were moderately-high correlations, our regression diagnostics did not find evidence of multicollinearity in our regression models (see above). Lastly, the two outcome variables were positively and significantly associated at $r = 0.55$ ($p < .05$) suggesting that students who reported higher cultural congruity also reported higher academic confidence and vice versa. These significant associations provided support for our theoretical approach and selection of key study variables, and preliminary support for our research hypotheses.

The inferential results are in Tables 2 and 3 and represented a more stringent evaluation of the research hypotheses. The results for cultural congruity are in Table 2 and Model 1 found that only one of the control variables was statistically associated with this outcome: those in

doctoral programs reported lower levels of cultural congruity than those in master's programs. As a block of variables, the omnibus F-test (7, 36) of 1.34 was not statistically significant ($p = 0.26$) and the low adjusted R-Squared of 0.01 suggested that this block of control variables contributed little to the explained variance.

Table 2

Robust Regression Unstandardized Coefficients for Level of Cultural Congruity: for American Indian Graduate Students in STEM (n=44).

Variable	Model 1				Model 2			
	β	SE	p	95% CI	β	SE	p	95% CI
Peer interactions index	—	—	—	—	0.73	0.26	.01	[0.20, 1.26]
Mentor's cultural support index	—	—	—	—	0.17	0.20	.40	[−0.24, 0.58]
University environment fit index	—	—	—	—	0.22	0.15	.17	[−0.10, 0.53]
Control variables								
Cultural identity index	−0.01	0.23	.96	[−0.48, 0.46]	−0.20	0.17	.23	[−0.54, 0.14]
Females (vs. males)	0.24	0.47	.61	[−0.72, 1.21]	0.16	0.31	.60	[−0.47, 0.80]
Doctoral (vs. masters)	−0.70	0.34	.05	[−1.40, 0.00]	−0.45	0.29	.14	[−1.04, 0.15]
Pure life, hard (reference)	—	—	—	—	—	—	—	—
Discipline not specified	0.96	0.92	.91	[−1.78, 1.97]	−0.39	0.96	.68	[−2.35, 1.56]
Pure nonlife, hard	−0.40	0.52	.45	[−1.45, 0.65]	−0.29	0.31	.36	[−0.92, 0.35]
Applied life, hard	−0.74	0.49	.14	[−1.74, 0.25]	−0.63	0.28	.03	[−1.2, −0.06]
Applied nonlife, hard	−0.10	0.63	.87	[−1.39, 1.18]	−0.23	0.41	.58	[−1.05, 0.60]
Intercept			5.38				1.54	
R-Squared			.15				.63	
Adjusted R-squared			.01				.53	
F-Statistic			1.34 ($p = .26$)				11.50 ($p = .00$)	

Note. Standard errors are robust errors. STEM = Science, Engineering, Technology, and Math fields.

The focal predictor variables were added as a block in Model 2 and produced three notable results. First, we found a positive and significant relationship between the peer interactions index and cultural congruity when accounting for all variables in the model including the other two focal variables. The significant unstandardized coefficient for peer interactions, $b = 0.73$, $p = 0.01$, showed that for a one-unit increase in more favorable peer interactions there was approximately a three-quarter unit increase in students' level of cultural congruity. Second, the omnibus F-test (10, 33) = 11.50, $p = 0.00$ revealed that the linear combination of the blocks of focal and control variables were significantly different than 0 suggesting that Model 2 explained a significant amount of explained variance. Third, indeed,

with an adjusted R-Squared of 0.53 Model 2 explained about 53% of the individual differences in cultural congruity levels. Yet, it was clear that the single variable of peer interactions index was the main driving force in this explained variance. Also, when compared to Model 1, it was clear that the block of focal variables was responsible for the variance explained in cultural congruity scores.

A similar set of results occurred in Table 3 for academic confidence. In Model 1, none of the control variables were statistically associated with the academic confidence index as none of the *p*-values reached a traditional significance level and all of the confidence intervals included a 0 value. Also, as a block of variables the omnibus F-test (7, 36) of 0.68 was not statistically significant ($p = 0.69$) and the negative adjusted R-Squared of -0.05 suggested that this block of control variables contributed little to the explained variance.

The focal predictor variables were added as a block in Model 2 and three findings converged with those for cultural congruity. First, we found a positive and significant relationship between the mentor's cultural support and university environment fit with academic confidence when accounting for all variables in the model including the other focal variable. The significant unstandardized coefficient for mentor's cultural support ($b = 0.58$, $p = 0.00$) showed that a one-unit increase in mentor's cultural support, was associated with slightly more than one-half unit increase in students' level of academic confidence. For university environment fit, the results ($b = 0.25$, $p = 0.02$) indicated that as students report a one-unit greater fit within the university environment their perceived academic confidence levels increased by a one-quarter unit. Second, the omnibus F-test (10, 33) = 15.38, $p = 0.00$ revealed that the linear combination of the blocks of focal and control variables were significantly different than 0 suggesting that

Model 2 explained a significant amount of explained variance. Third, with an adjusted R-

Squared of 0.75 Model 2 explained about 75% of the individual differences in academic confidence levels with the two focal variables of mentor's cultural support and university environment fit contributing to most of this explained variance.

Table 3

Robust Regression Unstandardized Coefficients for Level of Academic Confidence: for American Indian Graduate Students in STEM (n=44).

Variable	Model 1				Model 2			
	β	<i>SE</i>	<i>p</i>	95% CI	β	<i>SE</i>	<i>p</i>	95% CI
Peer interactions index	—	—	—	—	0.13	0.13	.32	[−0.13, 0.39]
Mentor's cultural support index	—	—	—	—	0.58	0.11	.00	[0.36, 0.80]
University environment fit index	—	—	—	—	0.25	0.10	.02	[0.04, 0.45]
Control variables								
Cultural identity index	0.20	0.19	.29	[−0.19, 0.59]	−0.02	0.08	.80	[−0.19, 0.15]
Females (vs. males)	0.17	0.41	.68	[−0.67, 1.00]	−0.25	0.15	.11	[−0.56, 0.06]
Doctoral (vs. masters)	−0.25	0.24	.28	[−0.74, 0.22]	0.10	0.15	.48	[−0.19, 0.40]
Pure life, hard (reference)	—	—	—	—	—	—	—	—
Discipline not specified	0.57	0.62	.37	[−0.69, 1.83]	0.03	0.26	.90	[−0.50, 0.57]
Pure nonlife, hard	−0.21	0.42	.61	[−1.07, 0.64]	0.12	0.21	.56	[−0.30, 0.54]
Applied life, hard	−0.11	0.38	.78	[−0.88, 0.66]	0.07	0.24	.78	[−0.43, 0.56]
Applied nonlife, hard	0.20	0.51	.72	[−0.84, 1.24]	0.07	0.18	.69	[−0.29, 0.43]
Intercept			2.94				.16	
<i>R</i> -Squared			.09				.81	
Adjusted <i>R</i> -squared			−.05				.75	
<i>F</i> -Statistic			.68 (<i>p</i> = .69)				15.38 (<i>p</i> = .00)	

Note. Standard errors are robust errors. STEM = Science, Engineering, Technology, and Math fields.

Discussion and Implications

This study aimed to understand three of the social and contextual interactions associated with Indigenous STEM graduate students' cultural congruity and academic confidence that are important to positive transcultural socialization, which can lead to greater AI/AN student persistence (Huffman, 2001), academic success (Waterman & Lindley, 2013), and well-being (Schiefer & Krahé, 2014). We hypothesized that these three factors of peer interactions, mentor's cultural support, and university environment fit are positively associated with cultural congruity and academic confidence. Our results find partial support for each hypothesis. First, regarding Hypothesis 1, we do find elevated levels of cultural congruity among those AI/AN STEM students who report more peer interactions, but not mentor's support or university environment

fit, were significantly associated with cultural congruity. Second, for Hypothesis 2, students report greater levels of academic confidence in the presence of added mentor's cultural support and university environment fit but not for peer influence. While each hypothesis receives partial support, taken together our findings show that all three of our focal variables—peer interactions, mentor's cultural support, and university environment fit—play a significant role in two perceived experiences (i.e., cultural congruity and academic confidence) that are important processes for positive transcultural socialization. Therefore, a comprehensive action plan will consider the macroenvironment of the university as well as the microenvironment of peers and mentors.

Our findings contribute to our current knowledge as we theorize that academic confidence and cultural congruity are important socialization outcomes that occur during the self-discovery and realignment phases of transculturation. In considering our findings it is important to theorize the ways in which cultural congruity and academic self-confidence align with transcultural socialization. For example, students' cultural congruity is their perception of the alignment between their culture of origin and the university culture and is measured by qualities such as students' ability to be themselves, be compatible with other students, reduce conflict with their personal values, and feel a greater sense of belonging to campus. Further, students in our study express self-discovery of their academic confidence such as intellectual stimulation, development, and growth and greater interests in ideas.

Our study finds that there are several important social and institutional factors that can influence these processes and have implications for practice and policy. In saying this, it is important to note two distinctive components of our study: (a) our sample of 44 AI/AN graduate students already in STEM is a unique feature because this is a larger number than the average

number of AI/AN students found in national datasets; and (b) our 12 participating institutions have been recognized as being specifically focused on Indigenous students through their strong support systems from admission to graduation (AISES, 2015).

Our first important factor is that peer interactions such as developing close personal relationships, attending cultural events, encouraging intellectual and personal growth, and listening to personal problems improved Indigenous graduate students' perception of cultural congruity. Our second important finding is that with heightened levels of university environment fit we also see heightened levels of academic confidence. Taken together these factors demonstrate how agents and institutions can create culturally and academically relevant policies and programs to leverage peer relationships and institutional contexts that allow AI/AN students to maintain their cultural integrity and enhance their academic self-confidence as they "fit-in in STEM" (Page-Reeves et al., 2017, p. 7).

For peer interaction, we add to prior studies (Heavy Runner & Marshall, 2003; Windchief et al., 2018) that have emphasized the value of family, community, and faculty in supporting AI/AN students' transition and persistence within mainstream university. In our study, peers provided additional support for students' cultural congruity and may reduce the feelings of isolation as AI/AN students navigate the STEM context. In terms of mental health issues and programs, past research has emphasized microaggressions that AI/AN students experience by their peers in the academic setting (Masta, 2018). Our research provides a contrast to these experiences of microaggressions and a guide to future programs by showing the positive ways in which peers can support AI/AN graduate students. Indeed, similar to research by Smith et al. (2014), AI/AN graduate students reported their success in STEM was facilitated by a sense of belonging to one's academic peers. Our study did not demonstrate a relationship between peer

interactions and academic confidence. Interestingly, our findings contrast prior research that demonstrated that horizontal peer relationships were important to doctoral students' intellectual development (Boud & Lee, 2005; Flores-Scott & Nerad, 2012). If we understand academic confidence as a component of intellectual development, then this may be an area for future research. The prior studies on peer relationships were not conducted on Indigenous graduate students.

Further, our positive association between university fit and academic confidence connects two vital processes to the success of AI/AN students. As such, the actual elements of programs and policies should stress the importance of Indigenous students' culture and its congruence with the university environment (Chee et al., 2019) because research shows that students who have been able to maintain their cultural identity and integrity, and strong affiliation to their culture of origin are more resilient and successful in college (Waterman, 2007) more confident and resourceful (Schiefer & Krahe, 2014), and demonstrate greater academic success (Huffman, 2001, 2013). Because cultural-environment fit is important for academic confidence, institutions need to develop contexts where AI/AN students feel comfortable, valued, cared for, and supported in order to boost their academic well-being. Wayfinding provides additional insight into the cultural-environment fit. In research by Page-Reeves et al. (2019) students expressed the importance of social and structural relationships within the institution that contributed positively to their agential process of learning how to navigate and find their voice within a cultural milieu. This in turn, gave students a sense of belonging. One recommendation to capitalize on the cultural-environment fit is to facilitate wayfinding and transcultural socialization through learning circles on issues important to Indigenous STEM graduate students, such as managing

resources and opportunities, cultural-disciplinary learning, developing agency, and giving voice

to Indigenous identity. This recommendation is consistent with Heavy Runner-Rioux, et al. (2018) who advocated for institutions to collaborate with indigenous students to create culturally responsive spaces.

To be sure, the Rendón and Muñoz (2011) validation theory supports the importance of faculty and the university environment in “harnessing” stereotyped students’ strengths and giving them confidence for academic success. This strength-based support is consistent with new asset-based socialization models that view cultural wealth and intellectual diversity critical for students of color (Garcia et al., 2020; Griffin et al., 2020; Antony & Schaps, 2021). Further specific action plans can merge our findings with previous research by Heavy Runner-Rioux et al. (2018) about the importance of cultural preservation to AI/AN graduate students’ persistence and Masta (2018) who highlighted how students continue to experience colonization in their educational contexts creating a need to defend their identities. Lastly, culturally relevant programs and practices in STEM fields may be uniquely situated to counter colonization as Page-Reeves et al. (2017) showed that STEM students rejected the stereotypes of colonization and its limitations and viewed pursuing a career in STEM as a way to extend their cultural identity from their communities and to indigenizing the university and STEM.

One surprising finding in our study was that mentor’s cultural support was not associated with students’ perceptions of cultural congruity, yet it was associated with student academic confidence. This finding is interesting given that our measure of mentor’s support focuses on culture (e.g., interest and appreciation for their culture, tolerance of cultural differences, and friendliness to their family) as opposed to academic advising. This surprising finding has implications for the way departments, colleges, and institutions develop and implement

mentoring programs. Indeed, one plausible inference of our finding is that mentor’s cultural

support may reinforce students' cultural identity which provides them with confidence to thrive intellectually (Windchief et al., 2018; Windchief & Brown, 2017). Huffman (2001, 2013) showed that students with a strong cultural identity were more likely to succeed academically as this cultural identity provided the psychological and emotional grounding to develop knowledge and skills contributing to their success. Thus, any Indigenous training for mentors must emphasize the need to go beyond academic issues and also place a value on AI/AN students' culture and family, which may reinforce the strength of their cultural identity and provide a positive and safe environment for students to successfully navigate academic challenges.

As we present these implications and recommendations for programs and policies, we must use caution in generalizing about AI/AN STEM graduate students for multiple reasons that derive from their individual differences, including strength of Indigenous identity, tribal affiliation and culture, STEM discipline, previous educational experiences, intersectionality, and within-group diversity of Indigenous students. Added to the challenges most students face, Indigenous graduate students in STEM may experience even greater dissonance due to (a) the lack of understanding of Indigenous culture among those in the dominant culture; (b) faculty who are not prepared to discuss family, culture, and identity issues; (c) conflicts between mainstream and Indigenous norms; (d) conflicts between traditional Indigenous worldviews and the nature of Western science; (e) competition and individualism versus being part of a community; and (f) reductionism versus inter-relatedness.

Limitations and Future Research

One limitation is that the evidence for validity of the instruments in samples of Indigenous graduate students is not available. AI/AN students are not a monolithic group, and the small sample of AI/AN graduate students for a quantitative analysis makes this an

exploratory study. Students were nested across different institutions, which may differentially contribute to students' experiences within the university environment. The universities in this study had well established and strong support systems for AI/AN students, so the study does not address universities that do not have a strong support system in place. The institutions are research intensive, which may influence the type of students enrolled and there are significant differences between tribal nations and regional differences that are not captured in this quantitative study but could be explored in future studies.

Likewise, each individual exists on a broad spectrum from little to extensive involvement in cultural immersion in their tribe (Windchief et al., 2018). The within-group differences of AI/AN population (different tribal affiliations) are not accounted for in this study. Our aim was to understand the broader social and contextual interactions that shape AI/AN students' transcultural socialization in STEM. The precise mechanisms that occur as AI/AN students interact with their peers, mentors, and university environment are not known. Future research can explore the nature of these relationships to provide a more nuanced understanding of AI/AN students' experiences. Also, it is not known if the mentors and peers were of the same cultural background as the AI/AN students. Future research could explore the heterogeneity and homogeneity of the peer and mentor relationships to understand if there are differences in the AI/AN students' socialization experiences in STEM. Finally, our research explored the university environment and not the specific STEM department. Another important line of inquiry is at the department level. Each STEM field may have a different culture, set of norms and expectations, and climate that shape AI/AN students' transcultural socialization. Some departments may have higher representation of AI/AN students than other departments which may affect the students' experience (Rendón & Munoz, 2011).

Conclusions: Revisiting the Four Rs

We conclude by revisiting the four Rs (respect, relevant, reciprocity, and responsibility) and how our research process embodies these values. Our research incorporates the four Rs which Kirkness and Barnhart (1991) identify in their seminal work as respect, relevance, reciprocity, and responsibility; all are vital in Indigenous knowledge systems, cultural values, and Native worldviews (Brayboy et al., 2014; Johnson et al., 2018). These four Rs, when practiced by peers, mentors, and the institution, can have a positive impact on Indigenous students' transcultural socialization.

First, it is vital to respect the cultural identity and values that Indigenous students bring with them to graduate school. In terms of respect, outcomes from this study and participants' inputs may inform structural changes at NNCUs in practical ways for current Indigenous students. Moreover, we respect the participants for their efforts and interest in giving voice to structural changes to carve out Native space within universities and future generations of students. Further, we respect the hard work by many mentors and institutional agents that make Indigenous graduate students feel valued, welcomed, and supported. Indeed, our study investigates the extent to which Indigenous students perceive the importance of their peers, mentors, and the institution valuing and respecting their culture.

Second, mentors play a paramount role in empowering students to engage in research and achieve academic confidence. When peers, mentors, and institutions practice reciprocity by valuing Indigenous students' culture it encourages students to more fully engage in their education. Through reciprocity, peer-peer and student-faculty cultural exchanges, learning, and co-learning can occur. Mentors and peers may also play an important role in supporting students who (re)connect with their communities as a new STEM professional.

Third, it is important to have culturally relevant and culturally responsible (responsive) mentoring. Culturally relevant peer interactions and institutional interactions will build a sense of cultural congruence. Therefore, institutions and the individuals involved are responsible for establishing and promoting culturally attuned learning communities. Relevance relates to our study variables as it is important to provide culturally relevant mentoring (vis a vis, Indigenous mentoring) and academic support as intentional practices in student socialization.

Finally, institutions and faculty have a responsibility to promote personal growth, academic growth, cultural integrity, and well-being of Indigenous students in their transcultural socialization. By recognizing the intellectual and cultural strengths of Indigenous students, we all have a responsibility to create a vibrant intellectual, safe, caring, and culturally diverse place for Indigenous graduate students to find strength in their identity, learn, and thrive personally and professionally.

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CHAPTER FOUR

NARRATIVE INQUIRY INTO CHINESE INTERNATIONAL DOCTORAL STUDENTS'

JOURNEY: A STRENGTH-BASED PERSPECTIVE

Contribution of Authors and Co-Authors

Manuscript in Chapter Four

Author: Shihua Chen Brazill

Contributions: This is a sole-author article. I wrote and revised the manuscript. For example, I prepared and analyzed the data. I generated all the figures and tables, contributed to all sections of the article, and cross-checked all citations and references. Then, I identified a target journal, submitted to the journal, and followed through with the publication process.

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NARRATIVE INQUIRY INTO CHINESE INTERNATIONAL DOCTORAL STUDENTS' JOURNEY: A STRENGTH-BASED PERSPECTIVE

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ABSTRACT

Aim/Purpose	This narrative inquiry study uses a strength-based approach to study the cross-cultural socialization journey of Chinese international doctoral students at a U.S. Land Grant university. Historically, we thought of socialization as an institutional or group-defined process, but “journey” taps into a rich narrative tradition about individuals, how they relate to others, and the identities that they carry and develop.
Background	To date, research has employed a deficit perspective to study how Chinese students must adapt to their new environment. Instead, my original contribution is using narrative inquiry study to explore cross-cultural socialization and mentoring practices that are consonant with the cultural capital that Chinese international doctoral students bring with them.
Methodology	This qualitative research uses narrative inquiry to capture and understand the experiences of three Chinese international doctoral students at a Land Grant institute in the U.S.
Contribution	This study will be especially important for administrators and faculty striving to create more diverse, supportive, and inclusive academic environments to enhance Chinese international doctoral students' experiences in the U.S. Moreover, this study fills a gap in existing research by using a strength-based lens to provide valuable practical insights for researchers, practitioners, and policymakers to support the unique cross-cultural socialization of Chinese international doctoral students.
Findings	Using multiple conversational interviews, artifacts, and vignettes, the study sought to understand the doctoral experience of Chinese international students' experience at an American Land Grant University. The findings suggest that

	Chinese international doctoral students use cultural capital (aspirational, linguistic, familial, social, navigational, and resistance) as leverage in this cross-cultural socialization process.
Recommendations for Practitioners	The findings from this study offer insights for practitioners into what institutions and departments might do to support Chinese international doctoral students in their socialization journey. It is vital to support the whole student through understanding their different forms of capital.
Recommendations for Researchers	Future researchers may want to further explore how students experience this process. An important question for future researchers to consider is: do Chinese international doctoral students benefit from multilingual discourse with their peers and from a multi-lingual command of the literature? Also, does the ability to read scholarly publications in both Chinese and English bridge a gap and strengthen professional identity development?
Impact on Society	Significant impact on society includes improved opportunities for cross-cultural learning, international partnerships, and support for positive socialization experiences where diverse students may use their cultural capital as strengths and express new ideas. Moreover, there is also an economic benefit for the institutions and communities that rely on international students' economic contributions.
Future Research	Future research may want to explore how students perceive and experience multilingualism as a benefit in their education; for example, does the ability to read scholarly publications in both Chinese and English bridge a gap and strengthen professional identity development?
Keywords	Chinese international doctoral students, socialization, cultural capital, strength-based perspective, narrative inquiry

INTRODUCTION TO THE STUDY

Language discrimination is a problem that broadly impacts international students and students from linguistically diverse backgrounds (Lee & Rice, 2007). How would you like to be scolded for speaking your native language among friends? Several Chinese international graduate students took to Twitter to make it known the discrimination they experienced. The story went viral and was reported in the *New York Times* (Mervosh, 2019). Thus, this study is a timely account of Chinese international students' experiences. Though Duke University apologized after Assistant Professor Dr. Neely requested Chinese students to stop speaking Chinese on campus and threatened them with loss of future internship opportunities (A. B. Wang, 2019), that alone did not make the problem go away. The lone case reported at Duke University resonated with Chinese students who experienced similar problems at other universities.

Chinese students are the largest international student group in the U.S. at 34.6% in 2020 (Moody, 2020), and their tuition is a major source of revenue for many universities at \$15 billion (Mervosh, 2019; Neuliep, 2020; Swindell, 2020). News such as the Duke University incident spreads quickly on Chinese news and social media (Kuznetsova, 2018) and can negatively impact U.S. higher education institutions' ability to recruit and retain international students. Though the incident was formally reported at only one institution, its resonance with the Chinese student community demonstrates we have a long way to go in creating a supportive campus environment that is culturally attuned to all students.

Dr. Neely's demand that Chinese graduate students not speak Chinese and suppress their identity is an example of a racial microaggression. Racial microaggressions are actions or incidents that communicate racism either intentionally or unintentionally (Sue, 2010). Asking Chinese students to not speak their native language (Klotman, 2019) stems from the deficit view (Heng, 2016). Research

studies (Martínez, 2018; Wright et al., 2017) showed that being bilingual is a strength for diverse learners. Moreover, a second language provides a second lens to understand multiple perspectives, and the more non-Western that language is, the greater the difference and the more there is to be learned (Ning, 2020). This particular narrative challenges the grand narrative that Chinese students need to speak English 100% of the time to be successful in American universities. Rather, there are rich opportunities for Chinese students to use both English and Chinese when talking among themselves (Bialystok, 1999), as it facilitates double consciousness, code switching, and the development of complex identity (Ma, 2020). This aligns with a strength-based understanding of how multilingualism benefits Chinese students' development. Furthermore, Yosso's (2005) work shows that communication experience in more than one language is a form of linguistic capital. Chinese students, like other students of color, may bring multiple languages and communication skills to higher education, including storytelling tradition or communicate via visual art).

PROBLEM STATEMENT

To bring it full circle, the Duke University phenomena is just one example of the many challenges that Chinese international doctoral students face in U.S. doctoral programs. Existing research has broadly focused on the language, academic, personal, motivation, and sociocultural stressors of Chinese students' socialization to American higher education (Rawlings & Sue, 2013; Yan & Berliner, 2013). Moreover, extant research conflates Asian students as a homogenous group. Indeed, it is problematic that Asian students who have rich within-group diversity are often viewed as a monolithic group. Research indicates that Chinese international doctoral students must adjust their way of thinking to accommodate the norms of U.S. university academic culture (Heng, 2016). At times, socialization considered simply as assimilation could be inadequate due to these different ways of thinking. One example is that Chinese tend to use circular thinking whereas Westerners tend to use linear thinking, with this circular thinking reflected in both verbal and non-verbal communications (Brazill, 2016).

To date, research has emphasized an assimilation model; that is, how Chinese international doctoral students must adapt to their new environment (Hsieh, 2007; Rawlings & Sue, 2013; Yan, 2017; Y. L. Zhang, 2016). In other words, much of this existing research falls into the traditional deficit perspective of higher education, which emphasizes the deficiencies that Chinese students have when they enter American higher education and the particular skills they need to acquire in order to succeed (Yan & Berliner, 2011; Y. Zhou et al., 2008). To this end, the unique contributions of my narrative inquiry study are to explore cross-cultural socialization and mentoring practices that are consonant with the cultural capital that Chinese international doctoral students bring with them.

To address these gaps in the literature, my research relies on the lens of strength-based socialization to understand: (1) the positive life experiences that Chinese international doctoral students have when entering American higher education; and (2) the strengths that Chinese students bring from their unique culture that benefit their development and foster positive relationships with faculty and non-Chinese peers.

RESEARCH PURPOSE

The purpose of this study is to understand Chinese international doctoral students' narratives of how they leverage cultural capital as a strength in socializing to American higher education. Chinese doctoral students engage with American academic culture and use their cultural capital (aspirational, linguistic, familial, social, navigational, and resistance) as a strength in their socialization experiences (Yosso, 2005). In this study, socialization is operationalized as Chinese international doctoral students relying on their cultural capital as a form of strength to live and study in the U.S. This study intends to fill knowledge gaps by exploring the following research questions:

Research question 1: What are the forms of cultural capital that Chinese international doctoral students identify as most salient to their cross-cultural socialization journey?

Research question 2: How do Chinese international doctoral students describe the ways their cultural capital shapes their cross-cultural socialization journey?

SIGNIFICANCE OF THE STUDY

This research is significant because it explores students' perceptions of cross-cultural socialization and how they can draw on these experiences to maximize their learning. These experiences include interacting with peers and mentors and utilizing a broad set of campus resources. Through these interactions, students gain knowledge, skills, and abilities that help them successfully navigate postsecondary education (Castro, 2018; Le & Gardner, 2010; Weidman et al., 2001). Chinese international doctoral students' socialization is a multifaceted process for three important reasons. First, Chinese experience cross-cultural socialization by living in America. Second, Chinese students also socialize as doctoral students. And third, the different levels of socialization needed when Chinese students socialize to American higher education. This multidimensional process may be more complex than traditional doctoral student socialization as described in the literature. Further, as noted in the Duke University incident, Chinese students may also need to manage microaggressions or feelings of isolation as they navigate the new environment. Findings will be especially important for administrators and faculty striving to create more diverse, supportive, and inclusive academic environments to promote Chinese international doctoral students' experiences in the U.S. (Cotterall, 2013). This study will fill a gap in existing research by using a strength-based lens to provide valuable practical insights for researchers, practitioners, and policymakers to support the unique cross-cultural socialization of Chinese international doctoral students.

LITERATURE REVIEW

The purpose of this literature review is to: (1) explore Chinese international doctoral students' experiences; and (2) investigate how they express particular qualities (aspirational, linguistic, familial, social, navigational, and resistance) of Yosso's (2005) community cultural wealth framework in their strength-based cross-cultural socialization journey. The terms are defined as:

- **Cultural capital** refers to the particular qualities (aspirational, linguistic, familial, social, navigational, and resistance) of Yosso's (2005) community cultural wealth framework.
- **The strength-based perspective** is a holistic view of people's qualities and strengths, including character, promise, and resources/relationships (Saleebey, 2006). Cultural capital is a form of strength.
- **Cross-cultural socialization** refers to the cross-cultural process of learning to behave in a certain way to gain acceptance within a group we identify with (Howe & Lisi, 2020).

The databases searched were ERIC, PsycInfo, JSTOR, ProQuest, and Google Scholar. Generally, the year restrictions for the literature review are post-2000 because the concepts of socialization and Chinese international doctoral students' experiences in the U.S. have shifted greatly throughout time. Moreover, I selected publications based on impact (number of citations) and relevance to this research. Then, I investigated chains of citations to identify the development of critical work. In this study, Chinese international doctoral students are operationalized as those who are pursuing their PhD degree on the F visa (Ye, 2018). Let us begin by critically reflecting on why we should care about Chinese international doctoral students' journey in the U.S.

CHINESE INTERNATIONAL DOCTORAL STUDENTS: WHY SHOULD WE CARE?

Most doctoral education research uses the socialization framework to explore students' experiences (Weidman et al., 2001). This framework has been criticized for being monolithic and not taking into consideration the context and synergistic relationships between students and their doctoral programs (Gardner 2010). However, socialization is not unidirectional. It is instead an interactive process between faculty, students, and the university environment. Another critique of the socialization literature is that they often neglect individual student differences (Antony, 2002). Current socialization theories about doctoral students may expect students to compartmentalize their cultural identities to successfully assimilate into the new academic culture (Johnson et al., 2017).

Further, student diversity is a growing trend in higher education and universities compete globally for international graduate students (Bagley & Portnoi, 2014). The importance of Chinese students to American higher education is evidenced economically, socially, and culturally. Economically and socially, Chinese nationals make up the largest group of international students in the U.S., about 30% of all foreign students, with about 340,000 in 2018 (Y. Zhou, 2018). Moreover, Chinese international doctoral students are an important source of research labor for many universities (Altbach et al., 2011; Chao et al., 2017; Gong & Huybers, 2015). The increased competition for international graduate students in the global higher education market is evidenced by how U.S. universities struggle to recruit and retain diverse graduate student populations (Altbach et al., 2009). Given the current social and political trends, it is vital for American institutions to help Chinese international doctoral students feel welcome, safe, and supported. Moreover, if American higher education is more supportive of Chinese students, it will benefit the intellectual and cultural diversity of the institution and add value to the local economy. Culturally, prior research (Chen & Ross, 2015; Yuan, 2011) suggested that it is challenging for Chinese international doctoral students to socialize without losing their original identity because their cultural values may be incongruent with the norms and politics of American society. However, I would argue that even if Chinese international students try to socialize, xenophobia and hostilities as a result of American trade policies with China and the current COVID-19 pandemic have led to increased anti-Chinese prejudice, discrimination, and racism (Brownell, 2020). For example, former President Trump's rhetoric referring to the COVID-19 virus as the "Chinese Virus" or "Wuhan Virus" exacerbated this problem (Cho, 2020). Referring to the COVID-19 virus as "Chinese Virus" only increased safety concerns, xenophobia, and discrimination towards Chinese international students.

One important point may be that better relationships between China and the U.S. (superpowers) can come from young Chinese students who positively socialize to American universities and return home. They may see the U.S. not as a threat but more as a partner. For example, historically the U.S. government promoted academic exchanges to create a "mutual understanding" with other countries, as with the explicit goal of the Fulbright Program (Freedman et al., 2019). In turn, American students and faculty who engage with Chinese students can appreciate the intellectual, cultural, and political advantages of working collaboratively rather than competitively to enhance globalization. Moreover, the better the experiences of Chinese international students, the more likely additional Chinese students will attend that university because Chinese tend to define identity through group membership (Ardichvili et al., 2006). As an example of this collectivist drive, the population of Chinese students already enrolled at an institution influences college choice because prospective Chinese students believe that such a population will make them more acceptable (Mazzarol & Soutar, 2002). Furthermore, Chinese doctoral students at American universities are more likely to persist and graduate compared to other international groups, which is why recruitment is important (J. Zhou, 2014).

THEORETICAL FRAMEWORK: YOSSO'S COMMUNITY CULTURAL WEALTH

The organization of this literature review is guided by Yosso's (2005) six forms of cultural capital (aspirational, linguistic, familial, social, navigational, and resistance). Chinese international doctoral students face many unique challenges while studying and living in the U.S. (Huang & Klinger, 2006). Major challenges included conquering language barriers and culture shock, socializing with American peers and faculty, adapting to American higher education and culture, and coping with racial microaggression and discrimination (Huang, 2012; Kuo, 2011; Lee & Rice, 2007). Extant research has documented the challenges Chinese students experience as they socialize to American higher education. However, studies have not addressed the strengths that Chinese students bring with them to thrive in American higher education. Yosso's (2005) cultural capital framework can provide a new paradigm shift for how Chinese international doctoral students identify and use various forms of cultural capital as strengths vs. deficits during their socialization process. Chinese students cope with these challenges using the various forms of cultural capital, including aspirational, linguistic, familial, social, navigational, and resistance (Yosso, 2005). Thus, this study uses Yosso's community cultural wealth framework as shown in Figure 1 to explore how Chinese international doctoral students rely on their cultural capital as strengths to successfully navigate their cross-cultural socialization journey.

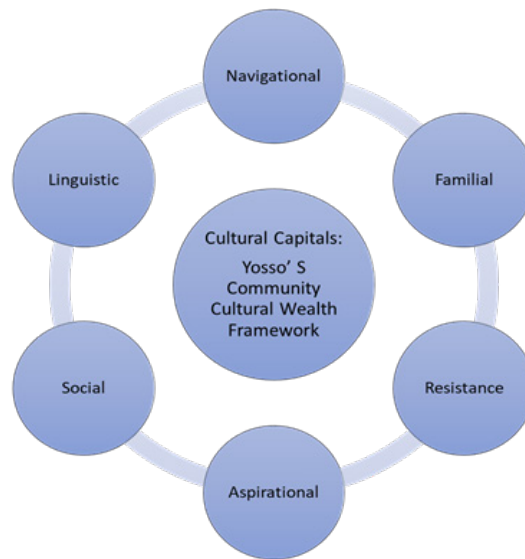


Figure 1. Adapted from Yosso's (2005) community cultural wealth framework

Although Yosso's (2005) framework was originally theorized to study Chicana/Latina undergraduates, it is well suited to study how Chinese international doctoral students can use their cultural capital as strengths for four important reasons. First, these capitals (aspirational, linguistic, familial, social, navigational, and resistance) are deeply rooted in Chinese culture and shed light on understanding inherent strengths of individuals (Ye & Edwards, 2017). Second, it focuses on the experiential knowledge that Chinese students bring with them or develop in their cross-cultural socialization journey. In other words, this paper employs a strength-based perspective to understand Chinese student's cultural capital as a form of experiential knowledge (Solorzano & Yosso, 2001). Chinese international doctoral students bring their own funds of knowledge and higher education should honor their cultural experiences and resources as strengths rather than deficits (Kiyama & Rios-Aguilar, 2017). Third, Chinese students cope with challenges using various forms of cultural capital. The six notions of cultural capital grounded in Yosso's (2005) conceptualization of community cultural wealth apply to Chinese international doctoral students and contradict the essentialist view and the misconception that Chinese students are the same as any Asian groups (Ye, 2018). Finally, this paper uses a strength-

based perspective to describe the ways Chinese international doctoral students' cultural capital shape their doctoral socialization journey by exploring the capital and resources that they bring with them or develop through their cross-cultural socialization journey.

One assumption of this study is that Chinese cultural capital can be used by Chinese international doctoral students to help navigate American higher education. Another assumption is that students continue to use their capital as they move through their doctoral journey. Unique to the framework proposed in this study is how Chinese international doctoral students experience American higher education and use their cultural capital as strengths in this cross-cultural socialization process. The following section explains the ways in which Chinese international doctoral students may draw on different forms of their cultural capital to shape their socialization process in American culture. Attention is given to how these forms of capital can provide Chinese students with an emotional and cultural anchor that helps them navigate and overcome challenges presented by the cross-cultural socialization process.

Familial

In 2017, students from Columbia University in New York City were targeted by racist vandals who ripped the name tags bearing their Chinese names off dorm doors (Lim, 2017). This harmed them as Chinese parents imbue their children's names with meaning and their names signify familial capital. Students rely on their familial capital to be successful (Fang & Wang, 2014). To an American, it might seem unacceptable for Chinese students to use their Chinese name, and a small matter for them to choose an English name that is more acceptable (or easier to pronounce) for their American colleagues (Rawls & Duck, 2020).

However, Chinese cultural and familial goals have major influence on Chinese international doctoral students' education trajectories in the U.S. (Crehan, 2017). Students rely on their parents' culture and social capitals, and college choice is highly influenced by their parents "as early as primary school to junior high school" (Chen, 2014, p.8; Fang & Wang, 2014; Mazzarol & Soutar, 2002). Chinese students with high test scores or wealthy families may seek out elite universities. In contrast, those with excellent but not top-level test scores or from families of modest means must settle for less-prestigious state universities in the U.S. (Zhao & Park, 2014).

Aspirational

Chinese students studying in the U.S. have faith in some versions of the American Dream, meaning that through hard work they can achieve success regardless of their social class or birthplace (Leong, 2015; Yang, 2015). Although the American Dream may be a myth, it exerts a powerful influence on Chinese students seeking to study in the U.S. The film *American Dreams in China* identifies challenges to the American dream such as social isolation, visa problems, and financial limitations (Yan & Berliner, 2013). Ballantine et al. (2018) confirm that Chinese students come to U.S. universities to chase the dream of freedom and opportunity. The demand exceeds the opportunity for graduate education in China, and this imbalance is fed by grueling and highly competitive admission processes (Altbach, 2004; Gong & Huybers, 2015; Gu et al., 2010). Despite this faith in the American Dream, new immigration policies and visa requirements diminish these aspirations and the Trump administration has reduced the flow of Chinese international students to the U.S. (Dennis, 2017).

Linguistic

High-context cultures communicate in ways that are implicit and rely heavily on context, whereas low-context cultures rely on explicit verbal communication (Neese, 2016). In general, America is a "low-context" culture, whereas Chinese culture is "high-context", and the Chinese language is full of ambiguity. In high-context cultures, understanding of unspoken rules and indirect implicit communication is required. In low-context Western culture, a direct and explicit approach is vital for effective

communication (Brazill, 2016). For example, American-style research and academic writing is unfamiliar to Chinese international doctoral students. Chinese seldom make the subject clear at the beginning of a sentence, and instead leave the audience room for interpretation. This holds true in oral speaking for Chinese as they often speak indirectly. In contrast, English academic writing is more direct with an emphasis on logical reasoning and organization. Chinese international doctoral students must balance their identity so that their thinking patterns conform to American styles (X. Liu et al., 2010). For example, the opportunity for Chinese students to apply their Chinese language and their high-context culture to academic work serves two important functions. One, it may allow Chinese students to think more creatively about their academic work. Two, it can internationalize their academic work and make it more accessible to a broader range of other cultures.

Social

Socialization is a fundamental aspect of graduate education. Students learn about academic expectations and roles and responsibilities of becoming a doctorate through the socialization process. Faculty and student peers are fundamental to this process. For example, faculty are influential in guiding students, including conference presentations and co-authoring publications (Li & Collins, 2018). Moreover, their academic social interactions within the U.S. scholarly culture include their mentoring relationships with advisors as well as peers (Najjar, 2015). Further, Chinese international doctoral students in American higher education encounter a unique socialization process: they may feel isolated, lonely, and stressed in socializing with their American peers. Therefore, they rely heavily on their Chinese peers for academic and emotional support by speaking Chinese with each other, and speaking Chinese is also a form of social bonding (Ye & Edwards, 2017), which at times results in misunderstanding with American faculty and peers (Najjar, 2015; Z. Zhang & Xu, 2007). This is very evident from the Duke University example where students were threatened not to speak or communicate in their native language with their friends. Language is a fund of experiential knowledge because it is integral to cultural identity and bi/multilingualism increases cross-cultural communication (Jandt, 2017). That being said, U.S. faculty and non-Chinese peers can benefit from socializing with Chinese international doctoral students or other international graduate students by learning more about their language and culture to build a “mutual understanding” (Freedman et al., 2019; Trice, 2004). For example, “English Corner” is a common social practice in China, where students and other English learners gather weekly to discuss a book, film, or cultural phenomenon. Further, Chinese language is a vital linguistic and social capital for Chinese international doctoral students to connect and socialize with Chinese peers and navigate the loneliness of studying and living in a foreign land.

Navigational and Resistance

Bista and Foster (2011) and Yuan (2011) studied how Chinese students navigate social and academic settings in the U.S. Key factors included motivation for learning, professional growth and ability, and frustrations of living and learning in the U.S. Frustrations included communication and language barriers, discrimination, and pressure in balancing academy and employment. Higher education should strive to create an inclusive environment for all students, where they not only feel safe but also feel brave to be who they are (Brazill, 2020). Moreover, Alfattal (2016) developed an 8Ps model of campus climate as an improvement upon the traditional 7Ps model (people, program, place, promotion, price, process, and physical facilities) developed by Kotler and Fox. The 8th P is “peace”, which includes motivational, social, emotional support, and a sense of security or safety (Alfattal, 2016). Some Chinese students and their parents perceive the U.S. as unsafe because of lax gun laws, high rates of violence, and Americans’ reputation for reckless behavior (Altbach, 2004; Gong & Huybers, 2015; Mazzarol & Soutar, 2002). For example, referring to the COVID-19 virus as the “China virus” feeds discrimination towards Chinese international students (Cho, 2020) and raised fears that they could be targeted. Therefore, culturally attuned language choice is a powerful way to collectively advocate for and support students of color (Gay, 2018). Creating a supportive campus climate is crucial to recruiting and retaining Chinese students (and other foreign students) and enhancing their experience in the

U.S. Chinese international doctoral students currently enrolled in the U.S. have been able to navigate and resist the challenges to persist in American institutions. An important reason is that their motivational and aspirational strengths help them overcome challenges in reaching their goals (Griner & Sobol, 2014). Embracing the strengths that students bring with them to higher education will make institutions a more diverse, inclusive, and equitable environment and allow Chinese international doctoral students to be successful.

ADDRESSING THE GAP IN THE LITERATURE: STRENGTH-BASED PERSPECTIVE

This study builds on Yosso's (2005) framework by providing a cross-cultural and strength-based understanding of this socialization process. Often, the deficit perspective was used to criticize minoritized students' home cultures for their lack of success. The strength-based perspective offers a holistic view of individual Chinese international doctoral students' cross-cultural socialization journey. The philosophy of strength-based perspectives was originated by Saleebey (1996). It emerged from social work and clinical counseling by building on the strengths and characters that people or families have instead of the traditional deficit model or trying to mold people into a modernist and hegemonic "one size fits all" approach (Saleebey, 1996; Saleebey, 2013). As shown in Figure 2, Saleebey (2006) argued that the strength-based perspective is a holistic view of people's qualities and strengths, including character, promise, and resources/relationships (CPR). In the case of Chinese international doctoral students, the character and resources that individuals bring and develop throughout their socialization journey will contribute to their promise by utilizing their cultural capital as strengths. It is important to note that the capital may be unique for different Asian groups because of their different cultural backgrounds.

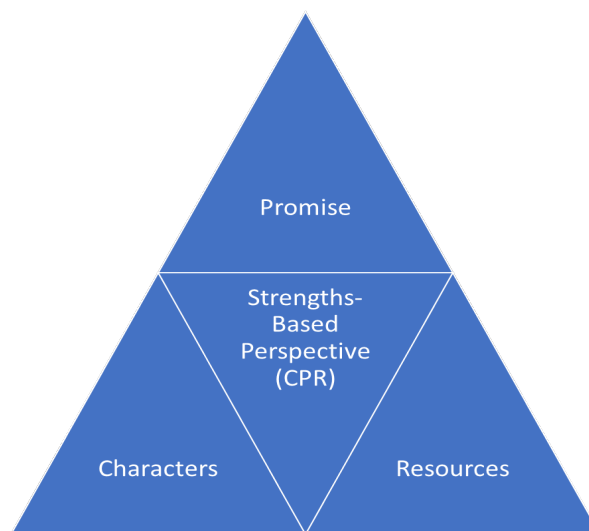


Figure 2. Adapted from Saleebey's (2006) strength-based perspective

The strength-based perspective addresses the gaps in the existing literature that Chinese international doctoral students need to succeed in American higher education, rejecting the extreme deficit model that demands full assimilation into U.S. culture and abandoning their cultural capital. Moreover, Yosso's cultural capital and the strength-based approach connect with each other because they both focus on individuals' strengths and unique attributes. For instance, the value of Yosso's cultural capital framework as applied to Chinese international students is that these capitals (vis-à-vis, strengths) enable them to develop new knowledge and skills while maintaining their cultural integrity during their socialization journey.

Historically, we thought of socialization as an institutional or group-defined process. “Journey” is a linguistically and culturally relevant choice to describe the socialization process because it implies that it is about individual people, the way they relate to others along the way, and the strengths (cultural capital) that they carry with them. Thus “journey” taps into a rich narrative tradition whether of Western Civilization’s lone hero or the immigrant journey that is so important to American history and society (Nelson, 2005). Importantly, this study uses a narrative approach to understand Chinese students’ stories as they engage in the cross-cultural socialization journey. Chinese students’ cross-cultural socialization journeys include a number of important relationships such as peers and faculty who are part of their stories. Therefore, narrative inquiry is an appropriate approach to study Chinese students’ socialization journey because it is a recursive process to investigate individual and social experiences (Clandinin & Huber, 2010). Also, “journey” is a culturally attuned choice as it aligns with the Chinese narrative tradition such as Journey to the West.

METHODOLOGY

The methodology section includes approach to this study, positionality/location statement, site selection (context of the study), sample and sampling procedures, data collection strategies, data analysis strategies, ethical considerations, authenticity, trustworthiness, credibility, and transferability.

APPROACH TO THIS STUDY

This qualitative research uses a narrative inquiry approach to capture and understand the stories (Connelly & Clandinin, 1990; Freedman et al., 2019) of three Chinese international doctoral students at a Land Grant institute in the U.S. Narrative approaches can be traced to Dewey (as cited in Savin-Baden & Major, 2013) who believed that life is an educational process whereby people reconstruct experience into meaningful stories which reveal social and cultural contexts (Savin-Baden & Major, 2010; C. C. Wang & Geale, 2015). Further, narrative inquiry is “collaboration between researcher and participants, over time, in a place or series of places, and in social interaction with milieus” (Clandinin & Connelly, 2000, p. 20). Through the participants’ stories and artifacts, personal and human dimensions of experience are captured over time and take into account the relationship between individual experience and cultural context.

In this study, narrative inquiry empowers Chinese international doctoral students to share stories and helps gain a more fluid, complex and detailed understanding of the issue within a global context (Creswell & Poth, 2018; Ye, 2018). Moreover, narrative inquiry allows me to co-construct meanings with Chinese students as an insider (Creswell & Poth, 2018).

Specifically, there are five important reasons for using narrative inquiry to understand Chinese international doctoral students’ cross-cultural socialization journey. First, narrative inquiry aligns with my social constructionism perspective, allowing me to co-construct stories with participants through interactions, dialogue, and collaboration. Reality and knowledge are developed from inquiry and shaped by relationships between experience and context as well as relationships between researchers and participants (Clandinin & Huber, 2010). Furthermore, knowledge developed from narrative inquiry is textured by particularity and incompleteness, leading less to generalizations and certainties, and more to alternative possibilities (Clandinin & Murphy, as cited in Clandinin & Huber, 2010). Second, narrative stories shed light on individual identity and how people see themselves. Third, narrative inquiry is best when capturing the detailed stories or experience of a small number of individuals (usually ranging from one to three) whose stories might otherwise not be heard (Savin-Baden & Major, 2010). Fourth, narrative inquiry allows the researcher to spend considerable time with each participant and collect multiple types of data, including stories triggered by artifacts, that result in thick descriptions. Finally, a culturally relevant reason for using the narrative approach is that it relates to Chinese culture’s penchant for storytelling and valuing of circular relationships (*guan xi* 关系). Even though we can translate “*guan xi* 关系” as “relationship” in English, the circular and reciprocal nature of the Chinese “relationship” might not be understandable to Westerners without the cultural context. In

other words, as opposed to the American sense of tit-for-tat, the Chinese notion of “*guan xi* 关系” implies obligations that transcend the immediate relationship, extending to a wider circle of family, friends, and colleagues (Brazill, 2016).

POSITIONALITY AND SELF-LOCATION STATEMENT

This study brings a strength-based perspective (Hammond & Zimmerman, 2012) to empower Chinese international students in challenging the power system and using cultural capital as strengths in higher education. My knowledge in this research area is shaped by my personal and professional experiences. Sharing our positionality helps develop a relationship with the audience. Thus, in this section, I reflect upon my Chinese cultural heritage and explain how my cultural identity influences the way I experience the world. My identity as a Chinese doctoral student and first-generation college student is relevant to my commitment to social justice issues and cross-cultural socialization experiences. I have lived in the U.S. for almost a decade, which I learned could be a “melting pot” (assimilation, i.e., giving up one’s heritage culture and adopt the dominant culture’s values to fit in) or a “salad bowl” (cultural pluralism, i.e., retain unique cultural identity while navigating the mainstream culture) (Howe & Lisi, 2020; S. Liu et al., 2014).

The “salad bowl” analogy was first published by Kallen to stress cultural pluralism, meaning the salad ingredients retain unique characteristics without blending into one homogenous culture (Jandt, 2017). Cultural pluralism is when minorities are empowered to maintain their cultural values without assimilation to the dominant society (Jandt, 2017). The “salad bowl” analogy aligns with the strength-based perspective that cultural heritage is an asset, as contrasted with the “melting pot” deficit model requiring individuals to assimilate (Gallagher & Lippard, 2014). I self-identify as a Chinese American woman living in the “salad bowl” because I maintain my Chinese identity while navigating American culture and higher education. Personally, I rely on my Chinese cultural capital as strengths and that is why I challenge the deficit perspective and push back on the hegemonic structures deeply rooted in higher education.

I rely on the social constructionism paradigm and a cross-cultural/multicultural lens to frame my research on how participants construct shared meaning through their unique experiences and social interactions. This study aims to understand how Chinese international doctoral students used their personal and cultural strengths in the socialization experiences within American higher education. I have no personal connection with the participants, but we share a deep cultural connection given my insider role as a Chinese American. As an insider (a Mainland Chinese native), I am well-suited to provide insights into the phenomenon, such as my deep understanding of Chinese language, cultural values, and ability to establish trust with participants. For example, I negotiated my research agendas with research participants through designing, translating, and conducting in-depth interviews and collecting artifacts that are sensitive to their experiences.

SITE SELECTION (CONTEXT FOR THE STUDY)

I selected the research site because of ease of access and the university’s Land Grant mission to support students from diverse populations. Most Chinese students prefer living in larger cities; however, the study site is in a small city in the northern Rocky Mountain region. The university has only 17 Asian international graduate students and 4 Chinese international doctoral students. I conducted narrative inquiry conversational interviews with the participants who are Chinese international students pursuing a doctoral degree in various disciplines. Further, this institution is well suited to study Yosso’s capital because, being in a small city with low cultural diversity and few opportunities to interact with other Chinese, students may need to rely more on their capital and require more individual strengths to be successful.

The context for the study includes both distal and proximal factors (Seale et al., 2006). Distal factors depend on culture, socio-economic status, political, or social structures and proximal factors include

interactional settings or sequences. The distal factors for this study are derived from current globalization trends, including the changing cultural, economic, educational, political, and social environment (Bound & Turner, 2010; Ye, 2018). Distal factors also included internationalization in higher education, including institutions' use of proactive strategies to recruit international students. When it comes to teaching, research, and services, this includes mobilization of students, faculty, and staff as well as internationalization of curriculum, dual and joint programs, and offshore campuses (Li & Collins, 2018; Ye, 2018). The proximal factor is that the study is situated at University A, an R1 school in the Rocky Mountains. University A is developing international exchange programs such as study abroad programs, the Fulbright Teaching Excellence and Achievement program, exchange student and scholar programs, and efforts to recruit international students. Moreover, the current global competition for international graduate students may require that U.S. institutions make their environments more inviting to potential international students. This may have greater implications for Chinese international doctoral students given the current trade policies between the U.S. and China, which may communicate an inhospitable environment for Chinese students pursuing education in the U.S.

SAMPLE AND SAMPLING PROCEDURES

I used a snow-ball technique and a purposive sampling strategy (Creswell & Poth, 2018) to recruit three Chinese international doctoral students as participants through referral. My rationale for this approach was due to the limited number of Chinese international doctoral students at the research site. This study did not include any international exchange students, Post-docs, or exchange scholars who are not obtaining a PhD degree. Further, I chose three participants as a culturally attuned decision. The study site has four Chinese international doctoral students but since “four” (“*sì* 四”) is the unluckiest number in Chinese numerology because it is pronounced similar to the Chinese word for “death” (“*sǐ* 死”) (Sotheby, 2018), I selected three participants from Mainland China who met the selection criteria, excluding one from Taiwan due to cultural and language differences. In contrast, three is a lucky number in Chinese culture, and the character “*zhòng* 众” in Chinese makes up from three people, which means “three is a crowd or a large number of people” (Sun, 2016). Listening to three stories allowed me to gain greater insights into their experiences which resulted in stories with greater complexity. Table 1 summarizes the key characteristics of the study participants. The sample was comprised of two females and one male from a cross section of disciplines with two students in a STEM field, and one in education. To ensure confidentiality and anonymity, I assigned aliases based on Chinese last names preferred by the participants but having no relationship to their real names.

Table 1. Demographic characteristics of study participants

NO.	PARTICIPANT PSEUDONYMS	SEX	YEARS OF STUDY	PROJECTED GRADUATION	DEPARTMENT
1	Li	F	1st	2023	Education
2	Ma	M	3rd	2021	Engineering
3	Zhang	F	2nd	2022	Engineering

DATA COLLECTION STRATEGIES

Following institutional review board approval, I conducted narrative inquiry semi-structured conversational interviews with three Chinese international doctoral students to understand their cross-cultural socialization experiences. In my experience, even Chinese scholars who specialize in English language studies prefer answering questions in Chinese instead of English. I provided participants a choice of which language to conduct the interview in and they preferred sharing their stories in Chi-

nese. Hence, I translated interview questions from English to Chinese. After data collection, I translated the transcriptions to English for American audiences focusing on the context and meanings vs. word-for-word translation (Brazill, 2016). As shown in Table 2, each interview lasted approximately 120-150 mins with repeated follow-up interview conversations that lasted another 120-150 mins each. I included the interview protocol in the appendix.

The longer interview time allowed me to collect in-depth data to explore the complexity, multifaceted, and evolving participants' experiences and rich narratives (Savin-Baden & Majors, 2013). Importantly, I asked each participant to bring an artifact that represents who they are and their doctoral experiences. Artifacts are objects that facilitate participants in telling stories (Keats, 2009). As a native speaker and an insider, I am aware of building a trusting relationship with participants and understanding their stories fully (Ye, 2018). In sum, the two approaches prompted individuals to share stories and experiences.

Table 2. Narrative conversational interview

NO.	PARTICIPANT PSEUDONYMS	ORIGINAL INTERVIEW (Hours)	FOLLOW-UP INTERVIEW (Hours)	TOTAL INTERVIEW (Hours)
1	Li	2.5	2.5	5.0
2	Ma	2.5	2.0	4.5
3	Zhang	3.0	2.5	5.5

DATA ANALYSIS STRATEGIES

I recorded the interviews with permission from the participants. Also, I memoed and jotted reflective notes. Afterwards, I transcribed and translated the interviews. The initial process relied on first and second cycle coding (Saldaña, 2016) by using a codebook to manage and organize the data, reduce codes into themes, develop interpretations, and visualize the data with concept maps and stories. First cycle coding included identification of priori codes (a form of deductive analysis). I integrated participant conversations about their artifacts into the analysis and identified how the interview excerpts/rich quotations reflected Yosso's six forms of cultural capital (aspirational, linguistic, familial, social, navigational, and resistance). Then, second cycle coding was used to identify open codes with patterns (a form of inductive analysis), for example the metanarrative of how Chinese international doctoral students rely on each capital as strengths.

Throughout the coding process, deductive coding was applied to understand the individual and common stories from the participants as what and how they rely on the six forms of capital in their cross-cultural socialization journey. Also, I used advanced analytical techniques such as RITES (read, interrogate, thematize, expand, and summarize) (Savin-Baden & Majors, 2013) for interpreting the narratives. Further, I relied on "plugging in" to include cultural insights and the strengths of the participants in the meaning making process (Jackson & Mazzei, 2013). As a result of plugging one context into another, I translated and interpreted how the participants narrated their stories, i.e. how they used Chinese characters and metaphors to enrich their intercultural stories and to generate new perspectives about their cross-cultural experience. Further, the concept of "thinking on the threshold" (Jackson & Mazzei, 2013; Stopford, 2020) also guided my process of understanding the meanings of the artifacts. For example, I embraced uncertainty of the data analysis process and problematized how the various forms of cultural capital (aspirational, linguistic, familial, social, navigational, and resistance) in Yosso's community cultural wealth theory functioned in Chinese international doctoral students' socialization process.

ETHICAL CONSIDERATIONS: STORIED THINKING

This study was IRB approved. However, narrative inquiry raises ethical considerations that move beyond the IRB process to empathic listening and suspending disbelief (Clandinin & Murphy, as cited

in Clandinin & Huber, 2010). Narrative inquirers should do research with and for participants, not on participants. I embraced relational responsibility during the inquiry process, such as honoring participants' narrative authority, openness to multiple voices, and considering the audience (Clandinin, 2006; Clandinin & Huber, 2010).

ACHIEVING AUTHENTICITY, TRUSTWORTHINESS, CREDIBILITY, AND TRANSFERABILITY

I used several strategies to ensure the quality and integrity of the data. Credibility was addressed in developing the interview questions by seeking feedback from Chinese international doctoral students who were not part of the study. This feedback allowed me to improve the comprehensibility of the interview questions within a manageable time frame (Brazill, 2016). Furthermore, Creswell (2018) suggested using peer debriefing, seeking participant's feedback, clarifying researcher bias or engaging in reflexivity for validation. Therefore, I ensured validity and authenticity through clear communication of my research purpose, paradigmatic assumptions, and positionality. Moreover, I addressed authenticity through my own ethos as a Chinese graduate student and using the students' native language to conduct the interviews. The reflexive process allowed me to identify my advantages, inherent values, and experiences as an insider to provide greater insight into the phenomenon.

Throughout the manuscript, I used inter-subjective reflections (researchers and participants co-involved in the meaning making process) to engage in reflexivity (Savin-Baden & Majors, 2010). Also, this reflexivity process allowed appreciation for various perspectives through collecting narrative stories shaped by participants' experiences (Corlett & Mavin, 2018). Moreover, I ensured trustworthiness through several steps. First, I had a Chinese and an American qualitative researcher review the transcripts, translations, and codebook. Second, I triangulated data by using different data sources (artifacts and interviews), kept a reflexive journal and took notes during the data collection process, and conducted member checking by providing interview transcriptions and translations to participants for validity and accuracy check (Creswell & Poth, 2018). Lastly, I had participants review the narrative stories and the manuscript to make sure the stories accurately represent them. It is important to capture their multiple forms of capital within the stories because individual's narratives are multidimensional. As a limitation, these stories are temporarily limited as the participants may continue to develop over time.

FINDINGS

The three participants are from different disciplines and in different years of their doctoral journey. They explained how aspects of their cultural capital inspired them to persist in their graduate work. The findings include personal stories and the narratives from Chinese international doctoral students that challenge the deficit model and highlight how they use cultural strengths to navigate their doctoral journey. They identified cultural capital as the most salient strength and described the ways this capital shaped their cross-cultural socialization journey. The stories emerged from the narratives through conversational interviews conducted in Chinese as requested by the interviewees. Additionally, participants brought artifacts to the interview that represented their doctoral experiences. This was a way to prompt stories and help paint a fuller picture of how their cultural capital shaped their journey. The findings were presented by each participant's vignette to capture individual experiences. For each vignette, I first discussed their artifacts and how they represent their doctoral journey. Then, I described each participant's story and how each capital helped them navigate their cross-cultural socialization.

LI'S VIGNETTE: AS THE TWIG IS BENT, SO GROWS THE TREE (水到渠成)

Li's artifact

Li brought a Chinese teapot (Figure 3) to represent the importance of her aspirational and navigational capital during her doctoral experience. She described her PhD life as a roller coaster with its ups and downs. For example, she drinks tea when she is stressed as well as to celebrate success. Li said that making tea represents enjoying and trusting the process and slowing down during her doctoral journey. She wanted to take time to learn instead of rushing it as she did with her MA experience in China. Li describes her artifact in this way:

Although it's an artifact, it represents a state of mind and a quiet atmosphere. When you are particularly upset and distressed, you may not be suitable to make a decision at that time. Instead, you need to sit quietly by yourself, listen to traditional Chinese music, and drink tea; and then you think about these decisions. Sometimes, I think the most difficult part is having to choose. So, when you calm down and list the pros and cons of various choices, it will become clear. During the most distressed and the most difficult time is exactly when the tea and the quietness is most needed.

Worth mentioning, the American cultural code for coffee is profoundly different from the Chinese cultural code for tea. One cannot simply plug tea in as a substitute for coffee from an American cultural perspective. In China, drinking tea is both an inward way of showing gratitude for life and an outward way of socializing with others.



Figure 3. Li's artifact: Chinese teapot

Li's aspirational capital

Li is a 39-year-old female from Inner Mongolia, a relatively rural province in north-central China known for its vast prairie grasslands and forested mountains. She is a first year PhD student. Her hobbies are taking walks and, when her family visits her, traveling around the U.S. In her words, her choice to take the PhD in America was a “*shuǐ dào qú chéng* 水到渠成” (“as the twig is bent, so grows the tree”) process, meaning that her early experiences sent her down this path. For example, to understand more about U.S. education and culture in China, she took her BA in English Education and MA in Curriculum and Instruction in Education. She explained that U.S. education focuses on applying theory to practice, which would complement her Chinese education, which focuses more on theory. She pointed out that her PhD courses, such as Educational Statistics and Math Assessment, are very useful for her future teaching profession. In China, she was a primary school teacher but after coming to America and teaching at a university in Tennessee, she wanted to become a better teacher and experience the U.S. educational culture and system.

Using her aspirational capital, she is now currently studying and pursuing her doctorate at an American Land Grant university. She said that “American classrooms are more flexible and have more freedom compared to China”. She and her son are drawn to learning about American K-12 education. After almost finishing her work teaching Mandarin Chinese at a U.S. university with a Confucius Institute, a Chinese government funded educational organization promoting Chinese language and culture, she decided to go to a new place but wished to continue pursuing her PhD. She chose University A because of a faculty member’s connection, who continues to be her advisor. Coming from Inner Mongolia in Northern China, she is used to the cold weather and snow, and feels comfortable in wide open spaces. Before applying to the PhD program, she was accepted as a MA student for a year even though she obtained another MA from China. As a professional goal, she explained that “I wanted to share what I learned about the U.S. education system and comparative education with educators in China. Moreover, I learned that I enjoyed conducting research and teaching.” Li’s professional background as a teacher provided her a sense of place in the U.S. For example, Li’s aspiration to pursue her degree at University A was rooted in her intrinsic desire to learn more about how the American educational system differs from the Chinese system, to be a better teacher, and to share her American educational experiences with other teachers in China. This is mainly because China seeks to create world-class teaching and research, and there is a great hunger to reform education by incorporating American pedagogy that promotes critical inquiry and creativity, as opposed to traditional Confucian pedagogy (Deardorff et al., 2012). Each of these aspirations were strengths in which Li relied on in her educational journey.

Li’s linguistic capital

Before coming to the U.S., English was only a teaching tool for Li – she of course did not conduct her daily life in English. During her PhD, English became important for daily study, research, and social life. Furthermore, Li explained that “in the first semester, I met a good teacher, who helped me improve my English writing. The English language is a hurdle for me, as it is vital in completing my doctoral degree.” In Li’s first semester, she relied on her Chinese linguistic capital to read English peer-review journal articles by translating meanings. She shared her learning process with me, “I was nervous and discouraged in the beginning; however, it takes time to learn English language styles and academic writing; I often look up translated vocabulary in Chinese to better understand the English concepts.” Translating to Chinese allowed her to gain a better understanding of the English concept through connecting to a familiar context. The interaction between Chinese and English languages provided a more robust understanding of concepts and thinking from multiple perspectives. In other words, Li conceptualized her linguistic capital as a strength because the particular advantage of using the translation process helped expand her total knowledge in a dialectical way.

Li’s familial capital

Family is Li’s most important capital in navigating American higher education. Without her familial capital, she would not have the support to study in the U.S. For example, Li explained that:

My husband supported and motivated me to pursue a PhD. He is a lawyer and currently a Law PhD student in China who encourages me to learn new things and develop new ideas. He is my mentor because he inspires me to achieve my dreams and never give up. He helps with my family and comes to visit me from China. It is common for Chinese married couples to live apart for extended periods of time because of school or employment. I felt closer with my husband despite the long distance. We video chat daily via Chinese social media WeChat. Without WeChat, I would not survive. My family is proud of me for overcoming obstacles during the PhD.

Furthermore, Li shared that she was having a tough time with her PhD because her father was diagnosed with colon cancer and she had a baby in the U.S. during the COVID-19 pandemic. Her priority is her family, especially her precious newborn and her older son who attends third grade at a local

school. The strength she derived from her family enabled her to overcome some of the challenges of cross-cultural socialization as well as the challenges of doctoral work. For a woman such as Li who comes to study in the U.S. and brings her children along, there is no easy distinction between cross-cultural socialization and the challenges of doctoral work because her success as a graduate student hinges on taking care of her family.

Li's social capital

Li described how her relationship with faculty members and her advisor has deepened over time. One story she shared with me was:

My advisor inspires me with new ideas, and I enjoy following through on these projects. For example, I designed a comparative math education research project between China and the U.S. I found cultural identity is an important factor, such as, in developing math story problems, where Chinese students selected mooncakes while American students selected muffins.

Li appreciated her relationship with her advisor, even though they have different personalities with diverse communication and working styles, they have cultivated a reciprocal mentoring relationship. Furthermore, Li explained her loneliness as a doctoral student in a small city in the Rocky Mountains:

When working at another university, my American colleagues were more friendly, and they took us hiking and took part in children's birthday parties. I felt that they were very socially active. However, after coming here as a student, the foreigners I met were mostly neighbors and people at school who seemed very busy with their own work.

Li expressed feelings of alienation because her close friends in China were so far away. However, she was able to develop new social relationships with individuals in the community and the lab to help her feel less isolated. She was also able to continue to connect with her friends at home, share her research interests with them, and gain fresh insights on her research from them.

Li's navigational and resistance capital

Li often reflected on her cultural identity as a strength in navigating her doctoral journey. For instance, she approached assignments from a global perspective. Her multicultural experiences positively inform her research interest in comparing math instruction in China and the U.S. She shared with me that navigational capital is the second most salient capital during her PhD. After her PhD journey, she expects that navigational capital will be less salient because, "I am almost 40 and my life trajectory will be more stable after graduation." Li shared that even though resistance is the least salient capital during her PhD journey because there are many things she has no control over, such as COVID-19 or President Trump's threat to ban WeChat. However, she relied on the navigational capital as a strength to overcome these challenges by keeping in touch with those that she would like to deepen her relationship with despite the fact that she is an introvert. Turning now from Li's journey, we consider the very different case of someone whose life revolves around his laboratory research.

MA'S VIGNETTE: MY AMERICAN DREAM PULLS ME LIKE A MAGNET (磁铁)

Ma's artifact

Unlike Li, Ma said he could not distinguish different kinds of tea regardless of how expensive they are. He brought a magnet (Figure 4) as his artifact to represent his first impression with the university's Magnetic Resonance Laboratory. The lab served as a bridge for Ma to become a professional scientist. Ma described that "the magnet represents my aspirational capital because that is what attracts me to study in the U.S., and the future I am being pulled to." Furthermore, Ma specified that:

I like the assessment system in the U.S. that includes formative and summative assessments. So, I can reflect on what I learned. Each formative assessment is like a small milestone. I was lucky to enjoy group work with my lab teams, where we shared responsibilities during my undergraduate degree. In the U.S., we take fewer courses compared to China, but it requires more time researching to deepen my understanding of the subject matter.

Ma's reflection of formative assessments indicated his understanding of the PhD education trajectory in the U.S. as a journey and that he appreciates the opportunity to experience a different educational system.



Figure 4. Ma's artifact: magnet

Ma's aspirational capital

Ma, a 29-year-old PhD student in the Department of Chemical and Biological Engineering from Hubei, has a different story compared to Li. He took his BS in Chemical and Biological Engineering and continues his PhD without a MS degree because of differences in the fields. His American dream is to work hard to take the PhD and advance his expertise in his field. Ma's passion and love for his major inspired him to pursue the PhD and he dreamt of being a scientist.

Ma's familial capital

Ma also described his family as his biggest supporters, economically and emotionally. During his BS, his parents paid the tuition fees. For the PhD, he supports himself financially with GRA positions. Moreover, Ma expressed gratitude for his aunt:

My aunt is a local staff member [at the university where he studies] and she mentors me through my PhD. When I first arrived, she taught me many things, including how to use a phone card and how to buy a car. When she told me that you need to recruit interview participants, I immediately agreed even though I am very busy.

Ma's dependence on his familial capital shows that Chinese students honor their mentors and family elders, and generally do what they are told. Ma's aunt occupies the role of a family elder with experience regarding his challenges, and so she serves as a form of familial capital by providing insights and advice in helping him navigate life in the U.S.

Ma's linguistic capital

Ma shared that he often had to code switch back and forth between Chinese and English when reading scholarly articles. Ma used his native language as a linguistic capital to help him construct new scientific knowledge as a PhD scholar and future scientist. In this sense, it is not just a linear translation process between Chinese and English language, but a dialectical process that forges new kinds of understanding. For example, he mentioned that numbers are very difficult for him to translate because Chinese language is a symbolic language and the numbers have meanings that are associated with Chinese characters. In contrast, the English spelling of numbers, when translated to Chinese, does not connote extra-mathematical meaning. This is an example of how Chinese and English language can be incongruent at times and cause difficulty for cross-cultural communication. However, the struggles with English language did not stop Ma' from his doctoral study as he shared about using his Chinese linguistic background as a strength to better his English, "I began to understand the technical terminologies and how to operate the lab equipment once I understood the meanings in Chinese."

Ma's social capital

His relationship with faculty and committee members are professional. His relationship with his advisors/chair is described as "*yì shī yì yǒu* 亦师亦友" ("teachers and friends"). This concept is important in the context of Chinese culture because students often interact with their professors not just in the classroom but also outside of academia, building strong rapport. For example, Ma's advisor invited students from the lab for dinners and end of semester parties. Ma reflected that sharing food with his advisor helps build friendships that are long-lasting even after his doctoral journey. Food is such an important symbol in Chinese culture as Ma shared that:

For Chinese friends, we get together to share food because doing a PhD is lonely. In China, we visit friends and chat with colleagues. Here, everyone is busy, and you need appointments to talk with them. I do not have much time for socializing; however, I hang out with American peers from my lab and join their birthday parties.

In contrast, Ma met most of his U.S. friends during his undergraduate years through the lab and group projects. Also, due to his international student identity, he avoided political topics. Instead, he has a strong bond with local Chinese friends as they share food and support each other in their American journey.

Ma's navigational and resistance capital

Photography is his hobby and he was able to use this hobby as a strength to help him navigate and understand the cross-cultural differences between Chinese and American cultures. For example, Ma noted that:

In China, we are allowed to take pictures with children without permission. One time, I did not know about the privacy restrictions in the U.S. that I needed a parent's permission to take pictures with their kids, and I got in trouble. So, I learned that I need to be more cautious and be aware of the cultural differences.

Ma gave another example of how a cultural difference negatively impacted his doctoral study – not being able to take a nap after lunch. In China, students and faculty at all levels take a break between noon and 2 pm to eat and nap. Ma further elaborated that "I was very tired after lunch, so I often fell asleep when the professors were lecturing. One time I took a nap at a quiet place on campus and someone came to play piano and woke me up." He did not know how to explain such cultural differences to American students and faculty. Both examples that Ma shared help describe U.S. vs Chinese social and academic culture differences. In China, taking pictures with kids shows care for children and taking naps (napping after lunch) is also a cultural capital/strength whereas these were cultural deficits/weaknesses in the U.S.

Moreover, socialization in America can make for challenges when back in China. For example, after becoming used to a locale with fewer people, Ma felt uncomfortable when returning to China where people crowd together and do not queue. Furthermore, Ma stated “I have to observe many times about the U.S. culture to learn the differences. For example, I learned to hold the door open for other people.” Living in a heavily Caucasian small city in the Western U.S., Ma misses Chinese people “*rén qì* 人气” (“the crowd”) and Chinese food, and he would like to return to China after graduation.

Also, Ma described the first two years of his doctoral journey as mostly just coursework combined with initial research steps. During the process, he learned to be an independent researcher under the direction of his supervisor. He often proposed what he would like to do and used the feedback to improve his experiment. Now he is in his third year and passed the comprehensive exam, so he can focus on dissertation research. Ma’s goal for scholarly identity is to publish at least three peer-reviewed papers. Navigational and resistance capital allows Ma to be successful as a doctoral candidate and build his professional identity as a scientist.

ZHANG’S VIGNETTE: EVERY GRAIN OF RICE (民以食为天)

Zhang’s artifact

Zhang’s artifact is Sichuan Peppercorn (Figure 5), which represents her love for Chinese food and cooking since these mouth-numbing peppercorns are an essential ingredient. She describes that “When I first came here, American people viewed me as Chinese even though I cooked American food to fit in. Now, I realized that I love cooking Chinese food and it represents who I am.” Indeed, this artifact of cooking with Sichuan Peppercorn in traditional Chinese food for her family signifies her familial capital. When she cooks for Chinese friends and colleagues in the U.S. it provides her with a sense of belonging and social capital. When asked how much American faculty and peers know about Chinese culture and language, she described Americans as very interested in Chinese food, especially dumplings, stir-fry, and fried rice. Zhang shared that:

It seems like Americans do not know much about Chinese culture. I often shared some Chinese festival traditions with Americans to bridge the cultural differences. For example, in Chinese, last name comes before first name, and when I made mistakes saying English names, I would explain the cultural difference, so I was not misunderstood by others as being rude.



Figure 5. Zhang’s artifact: Sichuan peppercorns

Additionally, Zhang brought another artifact, a U.S. one-dollar bill, folded like a tiny Qing dynasty jacket (Figure 6). She received it as a gift from her parents and has carried it with her since middle school as an aspiration. The intertwining of the Chinese and American cultures represented in this artifact created a sense of “*yuán fèn* 缘分” (“Chinese concept of fate”). Though she did not intentionally plan her journey to the U.S., this artifact made her feel this sense of “*yuán fèn* 缘分”, her destiny to come and study in the U.S., had begun long ago.



Figure 6. Zhang’s artifact: \$1

Zhang’s aspirational capital

After her BS, 31-year-old Zhang, came to study in the U.S. because she had worked with her PhD advisor as a Lab Technician in China. In the lab, Zhang worked with two other Chinese friends who are post-docs. She enjoyed hiking on the mountain near campus, which created a sense of belonging to this place. She was proud of herself for learning how to drive and obtaining her driver’s license, a rare achievement for her generation in China. Zhang shared that her personality became more outgoing because of moving to a new environment and she was inspired to make new friends. In other words, Zhang brings aspirational capital with her as a strength that helped her become more extroverted and emboldened her to try new things.

Zhang’s familial capital

Zhang explained Chinese parents do not want their children to be far away because children are expected to care for them in their old age (women typically retire at 50 or 55, men at 60). Additionally, Zhang shared that her parents do not understand what she is researching for her PhD, but they care deeply about her. In Zhang’s words, “my family supports me wholeheartedly. Zhang’s familial capital support translated to personal strength for her doctoral journey as she shared that she is getting a PhD degree not only for her own professional development but for her family. She wanted her parents to be proud of her and that is the biggest motivation for her. Our relationship has deepened after coming to the U.S. I miss them more because of the distance.” For example, during the COVID-19 pandemic, she called her parents daily via WeChat video to see how they were doing. She normally called every few months before COVID-19. Zhang unpacked how her familial capital is a strength because she was able to develop stronger bonds with her family even though, or perhaps because, she is far away. Further, she saw this as a source of strength as she appreciated her parents for their financial and emotional support all these years, which helped her to be able to pursue higher education in China and now the U.S.

Zhang linguistic capital

She shared a story about language difficulty during her doctoral process, “It took a month for me to understand the lectures and readings. American slang and idioms are still difficult for me.” Reading and understanding English journal articles were especially difficult. However, Zhang continues to practice her reading and writing skills in academic English and she also learned from translating English vocabulary to Chinese to better understand the meanings of the concepts. For example, when given an assignment, she often visualizes how Chinese vs. American thinking patterns and linguistic differences might influence teaching and learning. Technical and scientific terms are more understandable in English once she knows what they mean in Chinese. In this sense, Chinese language serves as a strength for Zhang as it allowed her to think about her knowledge application in different contexts, perhaps this interactive linguistic conversion helped her develop more creative understanding, unique knowledge application, and problem-solving skills. In other words, this dialectical process of going back and forth between Chinese and English enlarges understanding of complex ideas.

Zhang’s social capital

Zhang’s mentor is a postdoc Chinese friend who conducts similar research, and Zhang followed her friend’s path. Her friend mentored her academically and supported her emotionally. Also, Zhang interacts with non-Chinese peers, including international students, in her lab and local church. Zhang shared that in the U.S. it requires more time to cultivate social relationships; however, she makes friends easily with Chinese. She explained that “when I first came here, I was overly friendly, and it seemed strange for Americans.” She gets together to eat Chinese dinners with her Chinese friends in the same university, so they feel less isolated. Of note was how Zhang shares her cultural capital (Chinese food) with non-Chinese peers as a way to connect with them and share her culture as noted in her vignette.

Zhang’s navigational and resistance capital

Zhang shared that how other people perceived her Chinese culture sometimes negatively impacts her doctoral journey. For example, she stated that “stereotypes towards Chinese students such as being good at math and the model minority have negatively influenced me when I encountered difficulty in math. I was afraid to ask questions, but I also did not want to be viewed as a passive learner.”

Despite these challenges, Zhang noted that she was able to navigate and resist during her doctoral journey because she wanted her research to positively influence people’s lives and the environment. Another example that Zhang shared was:

In Chinese culture, I was taught to be humble and always admit I have room to grow even when I know something well. I followed the Chinese cultural norms of “actions speak louder than words” and told my professors and peers that I needed to learn more about a certain subject area. However, my American peers appeared to know everything confidently and spoke up in classes even though they did not fully understand something. They could talk for hours when presenting work still in progress while I could not because of my cultural identity, which values less talk and more action. After a while, I learned that if I kept telling people that I did not know enough, they would show less respect for my professional identity. I am still trying to find the balance between the two cultures.

In this example above, Zhang’s reliance on action as opposed to words was her strength despite the culture differences and stereotypes. Following graduation, Zhang would like to do a postdoc, become a professor, or conduct research for a company. Being closer to Chinese culture, language, and family are important for her career trajectory.

METANARRATIVE OF CHINESE INTERNATIONAL DOCTORAL STUDENTS

A metanarrative helps link these multi-layered stories through shared meanings. As a metanarrative, the participants view the various forms of capital as strengths vs. deficits in their doctoral journey, for example, familial, aspirational, and navigational. Even though English is still a challenge for them professionally, they are able to improve their English skills through the meaning-making process of connecting to their Chinese language. More importantly, these capitals help shape the journey of cross-cultural socialization through the context of studying as Chinese international doctoral students.

This narrative inquiry used artifacts and vignettes to understand Chinese international doctoral students' socialization to American higher education. The findings included three important strengths from the vignettes, showing how Chinese doctoral students use their capital as leverage in the cross-cultural socialization process of American higher education. These forms of cultural capital (aspirational, linguistic, familial, social, navigational, and resistance) are important for how Chinese international doctoral students interact with each other, mentors, peers, and institutional environments.

One, Chinese linguistic capital was used to cultivate stronger relationships with family and friends, thus creating a home away from home with other Chinese. Two, throughout their doctoral journey familial capital became less prominent in the students' socialization process and had little effect on their identity as Chinese international doctoral students; however, at the beginning it was an important source of inspiration and support. Third, personal artifacts such as a teapot, a Sichuan peppercorn, and a magnet helped prompt stories that further developed levels of abstraction and complexity for how they understand their recognition of their strengths.

Building on Yosso's (2005) framework for Chinese international doctoral students, these cultural capitals (aspirational, linguistic, familial, social, navigational, and resistance) are not isolated. Instead, these capitals overlap with each other to create a sense of synergy. Familial and aspirational capitals interacted with each other as strengths for Chinese students to be successful. For instance, in the artifacts, students shared that their aspiration for their doctoral journey comes from their family support. Their family members inspire them to study in the U.S. and continue to empower them. Moreover, social and linguistic capitals interacted with each other to explain Chinese international doctoral students' cross-cultural experience using their strengths. For example, students shared that speaking Chinese as a linguistic capital facilitates social bonding with their local Chinese friends, helping them to feel less isolated, develop a sense of belongings, and to enhance their cross-cultural socialization journey. The findings suggest that Chinese language and translation help the interactive conversion of knowledge and understanding. As I pointed out in the introduction, being multilingual served as a strength for Chinese students because it allowed them to "think" cross-culturally and apply what they are learning to multiple cultural settings. This new way of thinking, that is going back and forth between Chinese and English, challenges the dominant narrative that all Chinese graduate students should only speak English if they want to succeed at studying in the U.S. Our participants' stories and artifacts suggested that being bilingual or multilingual allows them to apply the knowledge in different contexts which may not have occurred if they did not go through the iterative process.

DISCUSSION AND RECOMMENDATIONS

The discussion section includes how the findings address the research questions and previous literature, future research, implications and recommendations, delimitations and limitations, and conclusions.

CONNECTIONS TO THE RESEARCH QUESTIONS AND PREVIOUS LITERATURE

The purpose of this study was to answer the following two research questions: (1) what are the forms of cultural capital that Chinese international doctoral students identify as most salient to their cross-

cultural socialization journey? And, (2) how do Chinese international doctoral students describe the ways their cultural capital shapes their cross-cultural socialization journey? My research is significant in the field of higher education because the findings in this study provide readers a nuanced understanding as to how Chinese students use cultural capital as a strength to socialize to American higher education.

This study demonstrated how Chinese students used various forms of cultural capital individually and synergistically to support their cross-cultural socialization. The participants used several mechanisms to create a home away from home. One, they all identified cultural artifacts that provided comfort personally and academically in their educational journey. Two, their linguistic capital, i.e., intellectual and social skills attained through communication experiences in two languages (Brazill, 2019; Yosso, 2005), provides a new lens to understand complex concepts in English. Specifically, linguistic capital provides Chinese students' a sense of social support through communicating with their family and peers during their academic journey. Three, Chinese students rely on aspirational capital, i.e. the ability to maintain hopes and dreams for the future (Yosso, 2005) to help them persist and complete their doctoral programs. Fourth, familial capital, i.e., cultural knowledge nurtured through their extended family and community network (Yosso, 2005), is a form of strength that helps Chinese students feel a sense of belonging in the U.S.

The common themes that emerged from my findings highlight how Chinese international doctoral students express Yosso's (2005) cultural wealth model as strengths in their socialization experiences. Chinese international doctoral students described the way their cultural capital – including aspirational, linguistic, familial, social, navigational, and resistance – shaped their social interactions with peers, faculty, and staff. First, the aspiration of Chinese international doctoral students to study in the U.S. was driven by the international reputation of American higher education. All the participants were drawn to American higher education because of a Chinese culture that highly values education, and they chose a U.S. program based on its structure of discipline, challenging curriculum, and rankings that indicated quality. Second, linguistic capital is an important strength that Chinese international doctoral students used to connect with their Chinese peers for emotional support and communicate with their American peers for their academic success. Thus, the findings challenge the deficiency perspective evident in the case study of Dr. Megan Neely's misplaced concern about Chinese students using their mother language outside class. In contrast, Chinese linguistic capital interacts with social capital to reduce loneliness by creating a social environment that is similar to home. Also, it is an important way for them to process their academic understanding through translation and to exchange ideas and build relationships with Chinese peers. Therefore, Chinese linguistic capital served as a strength in their doctoral socialization journey. Third, family members and friends served as mentors for Chinese international doctoral students because of the deep connection and relational trust built through shared experiences and common understanding of Chinese culture. Fourth, social capital was reflected in Chinese international doctoral students' effort to interact and build relationships with both white and non-white faculty and students.

Findings from this study relate to the literature and make an original contribution to higher education in four important ways. First, as described from the common themes above, my findings supported how the aspirational, linguistic, familiar, and social capital elements of the community cultural wealth conceptual model (Yosso, 2005) apply to Chinese international students. Chinese international students' stories align with these elements of capital and they become strengths for their cross-cultural socialization. Second, navigational and resistance capitals may differ for Chinese international doctoral students compared to other students of color. Yosso's (2005) work on navigational and resistance cultural capital focused on critical race theory and how Chicana/Latina and African American students are able to use these two forms of capital to fight against racism and educational inequity in higher education. However, the Chinese international students that I interviewed were raised in China, a culture that regards navigational and resistance capitals as charged political terms. They did not want to talk about issues related to racism, discrimination, or President Trump's anti-China

rhetoric or his xenophobic behaviors. In China, discussion of political and ideological issues is forbidden (Zhao, 2008) and enforced through self-censorship. However, participants expressed that not talking about political issues in the U.S. is also a strength because they are able to let go of things that they cannot control. Third, Chinese international doctoral students' socialization journey should not be viewed as homogenous because they have unique individual identities and experiences (Ye, 2018). For instance, in my findings, different students used specific capitals differently, which shows the within-group diversity among individual Chinese students. For Li, familial capital means having a supportive husband in China who is able to provide strong financial support for the family so she can focus on her education. For Ma, familial capital means having his aunt close to help guide him with the non-academic side of studying in the U.S. For Zhang, familial capital means having parents in China who are proud of her achievements as a Chinese woman who studies abroad. Lastly, the findings extend our understanding of the stereotype that Chinese students have limited interactions with American faculty and peers. My study shows that Chinese doctoral students interact with their professors and peers both academically and socially (for example, sharing meals together). This is interesting in light of a frequent criticism of Chinese students, that they socialize only with other Chinese or isolate themselves and do not engage with Americans or American culture (Yan & Berliner, 2013).

IMPLICATIONS AND RECOMMENDATIONS

Significant implications include improved opportunities for cross-cultural learning, international partnerships in university settings, and support for positive socialization experiences where students may use their cultural capital as strengths (Ye, 2018). Prior research suggests that Chinese students attend American higher education to “break” from the Chinese system of learning. My study showed that one important reason that Chinese students pursued their American degrees was so that they could share their knowledge with educators in China. Therefore, the goal for them was not to break from the Chinese system of learning but rather to use their American education to enhance the Chinese educational system. In this sense, it is not a matter of Chinese vs. American educational systems; instead, it is a matter of synthesizing the two systems in a way that results in a new and improved form of higher education.

International doctoral student mobility contributes to American universities with many international doctoral students from diverse cultures taking their PhD in the U.S, with their tuition revenue and research productivity further strengthening American universities (King & Raghuram, 2013; J. Zhou, 2015). Yan and Berliner (2009) showed that Chinese students have listening, speaking, and writing challenges (or deficits) in American higher education. The unique findings in my study, however, show that these challenges also serve as strengths for students. Moreover, positive socialization experiences increase academic confidence and feelings of cultural congruity (Gloria et al., 2005). Thus, Chinese international doctoral students and other diverse learners will benefit from culturally sensitive peer and faculty mentors. As Merriam and Bierema (2013) pointed out, faculty should consider the identity of Chinese and other learners from non-Western cultures and not expect them to acculturate immediately to the Western way of learning. This again challenges the dominant narrative expressed by Dr. Neely, where she assumed that everyone must speak English in order to succeed. Thus, understanding the unique socialization needs will help tailor social activities and inclusive learning environments for Chinese international doctoral students.

Universities can create a climate that celebrates Chinese students' aspirational, linguistic, familial, social, navigational, and resistance capital through strength-based socialization and mentoring practices (Felder et al., 2014). The study has three important practical recommendations. First, studying individual experience with narrative inquiry advanced knowledge of educational research through challenging the deficit perspective and giving voices to three Chinese international doctoral students on their doctoral journey. Second, the findings indicated that Chinese international doctoral students'

cultural capital are grounded in their socialization experience. Third, by sharing the stories from Chinese international doctoral students, it calls for specific recommendations to help Chinese international doctoral students find a sense of belonging in their socialization process. The findings from this study offer insights into what institutions and departments might do to support Chinese international doctoral students in their socialization journey. It is vital to support the whole student through Chinese international doctoral students' different forms of capital.

In sum, this study provides important insights for how Chinese international doctoral students experience American higher education. This study can guide development of strength-based socialization practices that are consonant with Chinese international doctoral students' cultural and social background. Given the current political, economic, and social relationships between the U.S. and China, these findings have important implications for faculty and administrators in creating a more diverse, supportive, and inclusive academic environment. Moreover, there is also an economic benefit to the institution and community as Chinese international doctoral students pay higher tuition and contribute to the local economies.

FUTURE RESEARCH

New questions emerged from the findings in light of Dr. Neely's criticism that Chinese international doctoral students need to speak English among their Chinese peers. One strength of my findings is that it emphasized how Chinese students think, read, and learn through linguistic conversion between Chinese and English language. This emphasizes how being multilingual can be a strength. Future research may want to explore how students perceive and experience this process as a benefit to their education. An important question for future researchers to consider is that do Chinese international doctoral students benefit from multilingual discourse with their peers and from a multilingual command of the literature? Also, does the ability to read scholarly publications in both Chinese and English bridge a gap and strengthen professional identity development?

DELIMITATIONS AND LIMITATIONS

This research addresses Chinese international doctoral students' socialization experiences to better understand the role of cultural capital as strengths and how higher education can better serve them. The research is delimited to three Chinese international doctoral students' cross-cultural socialization experiences. Another delimitation is that this study did not include International exchange students, Post-docs, or exchange scholars who are not taking a PhD degree. One limitation of this study is that, like any qualitative research inquiries, the findings are not meant to be generalizable. Instead, they create in-depth conversations with individuals and thick descriptions to better understand their experiences.

CONCLUSION

This narrative inquiry study introduced a strength-based perspective for how Chinese international doctoral students engage in cross-cultural socialization. This strength-based socialization included aspirational, linguistic, familial, social, navigational, and resistance capital that Chinese international doctoral students bring to their cross-cultural socialization journey, and investigates how they interact with mentor, peer, and institution environments. I presented an example about Chinese graduate students who held Duke University accountable for discriminatory practices. This incident is just one specific example of a more widespread problem, along with many of the discriminations, xenophobia, hate crimes against Chinese international students that altogether have created a national urgency. Institutions must ensure their students have inclusive, supportive, and welcoming campus climates, cultures, and environments.

Through Chinese international doctoral students' narrative stories, stakeholders should appreciate the dynamic aspects of Chinese international doctoral students' cultural capital and recognize that they are not a homogenous group. Most importantly, the three Chinese international doctoral students

used many aspects of their cultural identities as strengths to support their doctoral journey. As faculty and administrators, we should encourage Chinese international doctoral students to embrace their cultural capital as strengths and not punish them for it. For example, from a strength-based cross-cultural socialization perspective, being multilingual is beneficial for Chinese students' scholarly identity development and helps them with the meaning-making process of academic English reading and writing.

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APPENDIX: INTERVIEW PROTOCOL

Pre-work: Identity Artifacts

- Select and bring to the interview a small object you believe best represents you and your doctoral experience.

During the Interview: Identity Artifacts

- Why and how did you choose this object/artifact to represent you and your doctoral experience?

Rapport Building with Chinese International Doctoral Students

- Tell me a little bit about your background?
 - Where are you from?
 - What hobbies do you have in your free time?
 - What does the role of your cultural identity play in the doctoral process?
- Tell me about your journey to graduate school?
 - Why did you choose graduate school?
 - Why did you choose your major?
 - Why did you choose this university?

Aspirational Capital Questions

- Can you tell me about you and your overall experience in the U.S. and the university? What are the best or worse parts of your doctoral journey?
- What do you wish to gain from your doctoral studies for your personal and professional development? Has it changed over time and how?
- What or who motivates you to pursue your doctoral program?

Social Capital Questions

- What have your interactions and relationships been like with your
 - Faculty
 - Chair/Advisor
 - Committee members
 - Friends
 - Family members
- Have these relationships changed over time? How and why? How do the above support your doctoral journey? Besides your advisor, is there anyone else who supports or mentors you?
- What have your interactions been like with your peers, including Chinese and non-Chinese peers?

Familial Capital Questions

- What is the role of your family in your academic experiences?

Linguistic Capital Questions

- What role does your culture of origin play in your graduate school experience?
- In what ways, does your linguistic background play in your graduate school experience?
- How much does your faculty and peers understand and take an interest in your Chinese culture and language background? How much do they know about your culture and language?

Navigational Capital Questions

- What internal and external barriers do you encounter towards your degree completion and how do you navigate the barriers?
- What are your plans for after graduate school?
 - Role of family and culture in these plans?
 - Is geographic location important?
- What advice would you give to a new Chinese international doctoral student?

Resistance Capital Questions

- What is it like being a student at this university?
 - Your program
 - Campus resources (how do you interact)
 - International clubs (did you join any)

Closing Remarks

- Is there anything else related to your doctoral experience that you would like to tell me about?

AUTHOR



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Her multicultural experiences have shaped her research goals to build a more just society through improved educational success for diverse students and helping dominant groups practice multicultural inclusion. Her current research examines higher education outcomes and academic experiences of underrepresented graduate students. Her publications and presentations include sole-authorships and co-authorships with colleagues. She has published on translation studies, multicultural education, diversity and identity in E-learning, curriculum design, inclusive teaching, and web-based pedagogy.

CHAPTER FIVE

CHINESE INTERNATIONAL DOCTORAL STUDENTS' CROSS-CULTURAL
SOCIALIZATION: LEVERAGING STRENGTHS AND MULTIPLE IDENTITIES

Contribution of Authors and Co-Authors

Manuscript in Chapter Five

Author: Shihua Chen Brazill

Contributions: This is a sole-author article. I wrote and revised the manuscript. For example, I prepared and analyzed the data. I generated all the figures and tables, contributed to all sections of the article, and cross-checked all citations and references. Then, I identified a target journal, submitted to the journal, and followed through with the publication process.

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CHINESE INTERNATIONAL DOCTORAL STUDENTS' CROSS-CULTURAL SOCIALIZATION: LEVERAGING STRENGTHS AND MULTIPLE IDENTITIES

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ABSTRACT

Aim/Purpose	The purpose of this study is to use narrative inquiry to discover and understand how Chinese students leverage their strengths and multiple identities in socializing to American higher education and their profession. Chinese students engage with American academic culture while embracing their multiple identities. I will explore the cultural strengths they use to socialize and develop their personal, social, cultural, and professional identities in their doctoral educational experience.
Background	Chinese international doctoral students encounter a unique socialization experience during their doctoral studies because they lack meaningful cross-cultural support. Likewise, it is problematic that Chinese students are often viewed as a homogeneous group and much prior research has emphasized the traditional deficit perspective in explaining how Chinese students must adjust and assimilate to the university environment.
Methodology	This qualitative research uses narrative inquiry to study Chinese international doctoral students' socialization experiences while retaining their authentic voices. Narrative inquiry allows for a more nuanced understanding of the experiences of Chinese students compared to the perceptions imposed by other stakeholders. The narrative methodology provides diverse ways to understand Chinese student interactions within American culture, place, and context. This study applies the three-dimensional approach to retell participants' stories. The three-dimensional approach is more holistic and provides a broad lens to learn about the interactions, past, present, and future experiences of individuals through time and space.

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Contribution	This research shifts the narrative from the deficit view to a strength-based perspective as to how Chinese international doctoral students can rely on their cultural values and multiple identities as strengths to succeed academically, socially, and emotionally.
Findings	Findings related to the literature in two important ways. First, findings support how the six cultural strengths of Yosso's community cultural wealth apply to Chinese international doctoral students. Chinese students' stories align with these strengths and through these strengths, they explore and develop their personal, social, cultural, and professional identity. Second, Chinese students' stories as a counternarrative challenged and contradicted the essentialist view and misconception that Chinese students are a homogenous group personally, socially, culturally, or academically.
Recommendations for Practitioners	The findings from this study offer insight for practitioners into what institutions and departments might do to support Chinese international doctoral students in their socialization journey. It is vital to support the whole student through understanding their multiple identities.
Recommendations for Researchers	Chinese students and other diverse learners may benefit from peer and faculty mentors in different ways. Therefore, understanding the unique cross-cultural socialization needs and strength-based perspective will help tailor social activities and inclusive learning environments.
Impact on Society	The current political, economic, and social relationships between the U.S. and China make it vital for American institutions to consider Chinese international doctoral students' cross-cultural socialization journey.
Future Research	Though it is hoped that this study is transferable, specific issues of how it can be generalized to other Chinese international doctoral students in other areas of the U.S. are beyond the scope of this study. Future research might explore how Chinese International doctoral students' socialization experiences differ depending on where they study in the U.S.
Keywords	doctoral socialization, Chinese international doctoral students, cross-cultural socialization, narrative inquiry, multiple identities, strength-based perspective

INTRODUCTION

The United States (U.S.) has long been the top country for international students, including Chinese international doctoral students. According to the International Education Exchange (IEE, 2020), China is the leading country in sending students to the U.S., with 372,532 in the 2019-2020 school year (before the COVID-19 pandemic), which accounted for 35% of international students and brought over \$16 billion. However, there is a significant flattening or even decline in the numbers of Chinese students attending U.S. universities due to the Trump administration's visa restrictions (Voice of America, 2019).

The focus of this research on Chinese international doctoral students' cross-cultural socialization experiences is significant for several reasons. Chinese international doctoral students positively contribute to U.S. higher education through economic revenue, academic prestige, and institutional diversity. First, Chinese international doctoral students are critical to U.S. higher education in terms of benefits. According to the Institute of International Education, international students' tuition and fees contributed over \$44.7 billion to the U.S. economy in 2018 (Daiya, 2020). Most international students pay much higher tuition and fees than their local counterparts, and this economic contribution generates high revenues to U.S. local communities and higher education (De Wit, 2002). Second, Chinese

international doctoral students contribute to academic prestige through diverse worldviews and research expertise. Indeed, most international graduate students are elite students in their home countries with high scores for Graduate Record Examinations and Test of English as a Foreign Language (Brazill, 2021). Moreover, these talented graduate students contribute to co-authored publications and federally funded research projects; these are important national contributions as well as vital socialization experiences (Véliz, 2020). Third, Chinese international doctoral students bring cultural diversity as well as engagement in civic participation, which in turn benefits the multiculturalism of universities and the greater community. For example, they may help faculty and peers to cultivate cultural humility, defined as an ongoing process of self-reflection of our experiences and assumptions by facilitating relationships with mutual empowerment, trust, and respect (Brazill, 2020; Foronda et al., 2015). According to Fisher-Borne et al. (2014), cultural humility moves beyond the term of cultural competence by allowing personal accountability in challenging institutional barriers that affect marginalized communities. Finally, the U.S. and China are two of the world's largest economies, and this bicultural exchange has the potential to impact the broader global markets through cultural learning, demystification, and stronger alliances (Y. A. Li et al., 2011).

Graduate education grew to become a major enterprise in American higher education (Golde & Walker, 2006; Walker et al., 2008). For several generations of Chinese families, the U.S. has been the top destination for study among Chinese international doctoral students because of its strong reputation and research innovation. The benefits of American Higher education for Chinese international doctoral students include enriching life experiences, self-cultivation, broadening perspectives in research, improving career prospects, and contributing to life betterment (Yang et al., 2017). Furthermore, international student mobility is an important part of globalization and it feeds the trend among institutions to recruit international graduate students (Ford & McMullin, 2016). International student mobility is molded through a web of intertwining contexts: external factors, institutional features, governmental influence, and individual preferences (Choudaha, 2021). Therefore, institutions must fulfill a dual mission by preparing graduate students for economic and professional success and educating students to participate in the global intellectual community (Nerad, 2010). International student mobility contributes to American universities with students from diverse cultures who learn global perspectives from each other (J. Zhou, 2015). Globalization has influenced U.S. graduate education through changes in the configuration of graduate programs and the development of socialization processes that lead to different outcomes for individual students (National Research Council, 2005). Last but not least, Chinese international doctoral students are an important source of research labor for U.S. research institutions (Brazill, 2021; Gong & Huybers, 2015) and constitute the largest number of international students receiving doctorates over the last decade.

The first opening up of China began in the early 20th century and can be traced back to the establishment of the Republic in 1911 and John Dewey's visit to China in 1919 (Y. S. Li, 2000). This eventually led to many Chinese students coming to Cornell and other American universities for advanced study (O'Mara, 2012). Dewey's significant influence on the modernization of Chinese education and Chinese international students' enrollment in the U.S. all the way to the 21st century should not be underestimated (Bevis, 2013; Fesmire, 2019). Although Dewey's direct influence ended temporarily in 1949 when the Chinese Communist Party took over the country, after the second opening up in the 1970s Dewey again became well known among Chinese scholars and his work is still popularly taught in universities (Su, 1995).

Approximately fifty years after Dewey and more than twenty years after the Communist victory, President Richard Nixon visited China in 1972 to meet with Chairman Mao Ze Dong and Premier Zhou En Lai. The goal was to build peaceful relations and to re-establish international relations. He was the first U.S. president to visit the People's Republic of China since it was established in 1949. The two leaders agreed to expand cultural exchanges between their two nations (Y. S. Li, 2000). This was an important historical event because subsequently China's Reform and Opening Up Policy, which be-

gan in 1978 and was implemented by Vice Premier Deng Xiaoping, contributed greatly to international partnerships with U.S. institutions by sending multiple waves of Chinese students known as “sea turtles” to study in the U.S. and then return to China (Y. S. Li, 2000). Afterward, the first Chinese-American academic ties between Johns Hopkins University and Nanjing University were created to ensure strong quality for graduate programs. In addition, Yale and Cornell also collaborated with China to recruit Chinese international graduate students (Altbach, 2013).

Recently, the academic expansion and rise of China’s research universities and graduate programs have led to the reduction of Chinese graduate students coming to the U.S. for study. Moreover, more than 800 private higher education institutions in China have enrolled more than 4 million students. The Chinese government-funded initiatives, such as the 985 Project and the 211 Project, provided funding to universities to develop world-class teaching and research by recruiting the best graduate students and scholars (Altbach, 2013). China is taking measures that will profoundly affect U.S. institutions, such as the continued expansion of graduate programs (Deardorff & van Gaalen 2012) and established incentive programs to encourage talented students to return to China from the U.S. (Altbach, 2013).

PROBLEM STATEMENT

Chinese international doctoral students encounter a unique socialization experience during their doctoral studies because they often lack meaningful cross-cultural support (W. Li & Collins, 2018; Zhang, 2016). Socialization is defined as a fundamental process by which students learn the values, knowledge, and skills of the profession (Weidman et al., 2014). For Chinese international doctoral students, their experiences often include a cross-cultural component that may rely on a different set of socialization processes (W. Li & Collins, 2018). For example, as Chinese international doctoral students integrate into American higher education, they bring unique qualities to academic culture. This fluid mixing of Chinese and American culture can create a more plural process as students and faculty from multiple groups and identities come together, each contributing to their mutual cross-cultural socialization journey.

Moreover, identities are individually and socially constructed and reconstructed through experiences (Vignoles et al., 2011). As such, identity can positively or negatively impact Chinese international doctoral students’ socialization journey and intercultural exchanges. If Chinese international doctoral students understand the salient elements of their multiple identities that contribute to cross-cultural socialization, then they can leverage these identities as strengths in their doctoral journey. However, it is worth noting that the work by Reynolds and Pope (1991) focused on multiple identity oppression from the deficit perspective. My study, on the other hand, challenges this deficit model with a strength-based model to explore the multiple identities that are important for Chinese international doctoral students’ socialization journeys.

PURPOSE OF THIS STUDY

I used narrative inquiry to discover and understand how Chinese international doctoral students leverage their identities as strengths in socializing to American higher education and their profession. Chinese students engage with American academic culture while embracing their multiple identities. I explored the cultural strengths they use to socialize and develop their personal, social, cultural, and professional identities in their educational experiences. Qualitative research allowed me to empower and interact with the stories of the students to develop a more complex, holistic, and deeper understanding of the issue within a given context (Creswell & Poth, 2018). Specifically, I used narrative inquiry to learn about Chinese international doctoral students’ lived experiences and to co-construct meaning with research participants (Clandinin & Connelly, 2000). The reflexive process allowed me to appreciate the various perspectives and collect stories shaped by each participant (Corlett & Marvin, 2018).

RESEARCH QUESTIONS

1. What do Chinese international doctoral students identify as most salient to who they are throughout their cross-cultural socialization journey?
2. How do Chinese international doctoral students describe the way they leverage their strengths and multiple identities in shaping their cross-cultural socialization journey?

REVIEW OF RELATED LITERATURE

The seminal work on graduate student socialization is the Weidman-Twale-Stein framework (Weidman et al., 2001). Socialization is an ongoing process and graduate student experiences are conceptualized as four stages: anticipatory, formal, informal, and personal (Weidman et al., 2001). Anticipatory socialization refers to expectations of graduate school and is often idealized as what graduate school should be. Formal socialization refers to being at graduate school and learning to become a scholar (involved in the experience of teaching, research, and service). Informal socialization describes how a student's life, campus climate, and peer interactions connect. Personal socialization refers to students forming their scholarly identity and becoming personally involved in their research interests (W. Li & Collins, 2018). At each stage, students engage in the academic culture, develop a professional identity, and commit to the roles and responsibilities associated with the profession (Austin & McDaniels, 2006; Weidman et al., 2020).

Johnson et al. (2017) critiqued the Weidman-Twale-Stein framework and existing literature about doctoral student socialization because the process discounted individual student differences and neglected culturally-diverse students' experiences (Antony, 2002; Gardner, 2007; Matthews, 2021). To address this gap, Johnson et al. (2017) recommended that future research explore empirically how students' multiple identities shape their doctoral socialization journey and how they become experts in their profession (Gardner & Doore, 2020; Gardner & Mendoza, 2010). Therefore, for the purpose of this article, I define cross-cultural socialization as a process whereby students embrace their multiple identities throughout their graduate studies and accrue benefits that help them more fully realize the strengths and potential of their experiences and interactions with peers, faculty/mentors, institutions, and places (Brazill & Munday, 2022; Brazill et al., 2021). This definition of cross-cultural socialization is drawn from scholarly work on multiple identities and a strength-based perspective in response to the limitations of research from a deficit lens, which was problematic.

The multiple dimensions of the identity model (Abes et al., 2007) explained that identity is a fluid social construct and heavily influenced by context. This framework provided an understanding of Chinese international doctoral students' multiple identities and individual experiences. Chinese international doctoral students and their identity formation should not be viewed as homogeneous because they have unique individual experiences, voices, and agency (L. L. Ye, 2018). Further, identity construction is a complex process, during which numerous individual and contextual factors collectively interact (McAlpine, 2012). According to Burke and Stets (2009), the different identities that comprise the self exist in a hierarchy, where those ranked highest are likely to be invoked in situations that involve different aspects of the self. For instance, professional identity or academic identity is described as a person's perception of themselves within the collective identity of the profession. The formation of professional identity is an evolving process shaped by socialization (Henkel, 2009). Furthermore, Oyserman and Destin (2010) originated identity-based motivation theory and believed that identities are dynamically constructed in context. People prefer identity-congruent to identity-incongruent actions and self-concept is a multidimensional cognitive structure consisting of multiple past, present, and future identities (Oyserman & Destin, 2010).

Gardner's (2009) doctoral student identity development model focused on professional development and provides the context in which students move through a series of non-linear phases as they navigate their doctoral education. Doctoral students develop identity in a three-phase continuum, including entry, integration, and candidacy (Gardner, 2009). These phases are not clearly defined stages and

can overlap, with the university environment intertwined throughout all three phases. Phase 1, Entry, is from before admission to when coursework begins. Support needed in this phase includes orientation and initial relationships with peers and faculty. Phase 2, Integration, includes completing coursework to develop knowledge and skills required for the comprehensive exam. Peer and advisor relationships are fundamental in this phase (Golde, 2005). Phase 3, Candidacy, is when doctoral students continue to develop their scholarly identities as independent researchers and career trajectories. Support for international doctoral students can include writing groups and research mentoring to reduce students' isolation (Ku et al., 2008). In sum, these theoretical perspectives are complementary for understanding Chinese international doctoral students' cross-cultural experiences in terms of their multiple identities. The research was delimited to Chinese international doctoral students' experiences during their three phases – Entry, Integration, and Candidacy. These students enter American higher education (phase 1) with various connections to their cultural identities. Further, students have personal, professional, cultural, and social identities, which they also leverage in their doctoral journey. Unique to my study is how Chinese international doctoral students use their multiple identities as strengths in this cross-cultural socialization process.

STRENGTH-BASED PERSPECTIVE FOR CROSS-CULTURAL SOCIALIZATION: DISMANTLE THE DEFICIT MINDSET

The potential economic, academic, social, and institutional benefits make it critical to understand the cultural and supportive experiences Chinese international doctoral students have within American higher education. Most of the literature theorizes Chinese international doctoral students from a deficit paradigm, which has been pervasive in educational sociology for over a century, meaning “differences in academic achievement by different groups of students are due to deficiencies within students, their families, and/or their culture” (Hogg & Volman, 2020, p. 863). For example, existing research (Lee & Rice, 2007; L. Ye & Edwards, 2017) suggested that international students, including Chinese international doctoral students, have felt unwelcome at American institutions due to language deficiency, writing, or communication barriers. All these together have reinforced deficit stereotypes toward Chinese international doctoral students.

In contrast, a strength-based perspective is a holistic view of student qualities and strengths regarding their aspirations, including the knowledge, talents, skills, capacities, cultural resources, and relationships (Fenton, 2008; Saleebey, 2006). There is limited research using a strength-based approach and this constitutes a gap in the current literature (Heng, 2018; Heng, 2020; Xiang, 2015). To address this gap, I draw on Yosso's (2005) community cultural wealth from a strength-based perspective and investigate how these theoretical concepts can be applied to empower Chinese international doctoral students during their graduate school journey. This is especially important because, to date, there is evidence that Chinese international doctoral students have historically been unempowered and excluded by American higher education mainly due to the model minority stereotype (Ruble & Zhang, 2013; Yu, 2006).

YOSSO'S COMMUNITY CULTURAL WEALTH: VALIDATE CHINESE INTERNATIONAL DOCTORAL STUDENTS' STRENGTHS

Yosso's (2005) community cultural wealth provided a strength-based perspective on how Chinese international doctoral students experience American higher education. Most studies (Yan & Berliner, 2013; Y. Zhou et al., 2008) on Chinese international doctoral students' cross-cultural socialization experiences adopt a deficiency narrative based on poor language and communication skills. The connection between identity and this deficiency narrative is that the dominant culture labels individuals as one single group without considering the within-group diversity and the individuals' unique experiences. I used Yosso's (2005) community cultural wealth theory to challenge this dominant narrative and advocate for a strength-based approach to empower and validate international graduate students by strengthening their cultural assets.

Due to the dominance of the deficiency viewpoint in the current literature on international graduate students of color, I proposed using Yosso's (2005) community cultural wealth theory to honor Chinese international doctoral students' cross-cultural socialization experiences for two reasons. First, although this theory was originally developed to study Chicana and Latina/o undergraduate students, one theoretical implication is to recognize how it also applies to Chinese international doctoral students, and how they can rely on Yosso's six strengths to be successful. In fact, many scholars (Burt & Johnson, 2018; Espino, 2014; Garcia et al., 2020; Huber, 2009) applied this theoretical model to study racial-ethnic identity groups, low socioeconomic status students, and students with other diverse identities. The empirical findings of these studies are that individuals are more successful in their cross-cultural socialization journey when they feel empowered, and their identities are validated as strengths instead of deficits. However, the application of this theory to Chinese international doctoral students has been underexplored. Second, and very importantly, this theory addresses a current gap in the literature by shifting the research lens away from a deficit standpoint to a strength-based perspective, focusing on students' experiential knowledge. Experiential knowledge is defined as the knowledge that people of color possess based on their personal lived experiences, storytelling, and individual and composite narratives (McCoy & Rodricks, 2015). Chinese international doctoral students bring cross-cultural knowledge, diverse content, and multiple perspectives to their socialization journey.

From a strength-based perspective, Yosso's (2005) theory explores six forms of cultural capital (linguistic, aspirational, familial, social, navigational, and resistance) that students of color bring to their cross-cultural socialization experiences. Like other culturally minoritized groups in higher education, Chinese international doctoral students can use their cultural capital as a form of strength to navigate their doctoral journey. It is important to recognize that students bring unique cultural assets from their personal, social, and professional backgrounds, which enables them to thrive despite the challenges (i.e., stereotypes, racism, and discrimination) they face studying and living in the U.S.

Throughout this paper, I use the term "strength" instead of "capital" as it is more culturally attuned to Chinese cultural values because "strength" in Chinese culture signifies spiritual and cultural synergy whereas "capital" was adapted from a sense of monetary or economic advantage (Glaeser et al., 2002). Thinking about social capital as a strength is a more robust metaphor that incorporates the social network, the psychodynamics of an individual's efforts to achieve their goals and individual social skills that can be developed and improved (Baron & Markman, 2000; Western et al., 2005). The six cultural strengths and Chinese international doctoral students' multiple identities intertwine with each other, meaning they are not isolated. Together, the strengths shed light on understanding the inherent values that Chinese international doctoral students and the experiential knowledge that they bring with them or develop in their socialization journey. Below I share how each of these six strengths is vital for Chinese international doctoral students' cross-cultural socialization experiences.

Linguistic strengths

According to Yosso (2005), linguistic strengths refer to the intellectual, cognitive, communication, and social skills developed through different languages and the traditions that underlie language, such as storytelling and cultural narratives. In essence, bi/multilingualism is a fund of experiential knowledge because it is integral to cultural identity and bi/multilingualism enhances cross-cultural socialization (Jandt, 2017). Studies (Anandavalli, 2019; L. Ye & Edwards, 2017) found that Chinese international doctoral students are more comfortable seeking out peers and mentors from their home countries for support because they share a common language, culture, and similar communication style. In this way, speaking their native language is also a strength and a way of socially bonding in challenging times such as the COVID-19 pandemic (Rashid & McGrath, 2020).

Aspirational strengths

In their theory, Yosso (2005) defines aspirational strengths as students' deep desire to maintain hopes and dreams despite the systematic barriers that they encounter in American education. Despite the current COVID-19 pandemic and the visa requirements set by the former Trump administration to reduce the flow of international students to the U.S. (Dennis, 2017), Chinese international doctoral students have been found to use their aspirational strengths with strong motivation, commitment, and support to persist in graduate school and to flourish during challenging times (Anandavalli, 2019).

Familial strengths

According to Yosso (2005), students draw strength from their community and family (immediate, extended, and chosen). Most importantly, familial goals strongly influence Chinese international doctoral students' educational trajectory in the U.S. (Crehan, 2017). Chinese international doctoral students have been found to use familial support as a form of strength to cope with acculturative stress and depression (Hahn, 2010). In other words, even though most Chinese international doctoral students come to the host country without their family, their familial strengths support their well-being and ability to succeed. For instance, in a recent study, He and Hutson (2018) found that Chinese international doctoral students leverage their family strengths through drawing support from the unconditional commitment, including financial and emotional support their family provides them to study in the U.S. Unlike their American peers, a graduate degree for Chinese international doctoral students represents their responsibility to their community and generations of elders who sacrificed for their education (Anandavalli, 2019). In this way, connecting with friends and family from their home countries regardless of the physical distances provides Chinese international doctoral students with familial strengths.

Social strengths

Similar to familial strength, social strengths can be defined as the social networks within international graduate students' communities, friendships, interactions, and cultural ties that help them to navigate difficult situations and hardships. In their study, Anandavalli (2019) found that international students support one another in the face of barriers by sharing resources such as food, transportation, and guidance to support each other's well-being. Chinese international doctoral students share needs such as social connections with other international students and cross-cultural friendships with their American peers. Likewise, Chinese international doctoral students learn about academic expectations and independent researcher roles from their faculty mentors. For example, faculty are influential in guiding graduate international students, including sharing professional networks during conference presentations (W. Li & Collins, 2018). In this way, international students from diverse cultures can rely on their social strengths to connect with a broader social and professional network that goes beyond their American peers and faculty. This line of inquiry is consistent with literature that shows having multiple mentoring relationships with different perspectives and insights leads to the successful socialization of graduate students of color (National Academies of Sciences, Engineering, and Medicine, 2020).

Navigational strengths

Building on Yosso's (2005) theory, navigational strengths can be defined as the cultural strengths that help international graduate students to successfully navigate social disadvantages. Compared to their White counterparts, Chinese international doctoral students must rely on their navigational strengths to navigate social and academic disadvantages such as mistreatment, racism, and discrimination (Bista & Foster, 2011; Lee & Rice, 2007). Chinese international doctoral students currently enrolled in the U.S. have been able to navigate and overcome challenges so that they can persist in American institutions. An important reason is that their navigational strengths help them overcome challenges in

reaching their professional goals and intrinsic motivations (Griner & Sobol, 2014). Therefore, by embracing the strengths that students bring and develop throughout their graduate school socialization process, institutions can create a more diverse, inclusive, and equitable environment, ultimately empowering international students to be successful.

Resistance strengths

From the strength-based perspective, resistance strengths refer to challenging the status quo, inequality, and systemic barriers through effective coping mechanisms (knowledge and skills) that minimize emotional distractions (Yosso, 2005). For instance, recent news reported that a Duke University professor demanded that Chinese international students stop speaking Chinese on campus and threatened them with the loss of future internship opportunities (Mervosh, 2019; Wang, 2019). This is an unfortunate example of international graduate students' experience; however, the silver lining is that several students relied on their peer network and resistance strengths to hold Duke University accountable for discriminatory practices. Though Duke University apologized, and the faculty member stepped down from her director role of graduate students, that alone did not make the problem go away. This and many other incidents are specific examples of a more widespread problem that includes many acts of xenophobia, hate crimes, violence, and racism against Chinese international doctoral students, that altogether have revealed deeply engrained structural racism and created a national urgency.

METHODOLOGY

The methodology section includes the narrative inquiry approach to this study, positionality, population, sample and sampling procedures, data collection, analytical strategies, as well as ways to ensure authenticity, trustworthiness, credibility, transferability, dependability, and confirmability.

NARRATIVE INQUIRY APPROACH TO THIS STUDY

Major and Savin-Baden (2013) argued that key characteristics of narrative inquiry include: (1) focus on individual experiences (whose voices might not otherwise be heard); (2) collect individual stories (context, characters, plot, place, turning points, and resolutions); and (3) retell the individual's story in chronological order.

Moreover, narratives are about people who act in space, time, and across a sequence of events (Major & Savin-Baden, 2013). Narrative inquiry uses three commonplaces – temporality, sociality, and place (Clandinin & Huber, 2010). As shown in Figure 1, temporality refers to past, present, and future experiences. Sociality refers to the personal conditions and social conditions/milieu (cultural, social, institutional, and linguistic narratives). Place refers to the geographical context or sense of place. In terms of temporality, Chinese international doctoral students experienced the COVID-19 pandemic and an anti-Chinese American administration. What does it mean, then, for Chinese international doctoral students to study in America at a time when leading politicians disparaged China and blamed China for the coronavirus? In terms of sociality, what does it mean to be so far away from their families and friends, able to interact only with a few other Chinese? In terms of place, what does it mean to be in a relatively small and isolated city in a rural U.S. state, so different from relatively crowded Chinese cities? Also, this space might be especially challenging for students who are not outdoors-oriented people, since so much of the local relationship to space is equated with outdoor recreation.

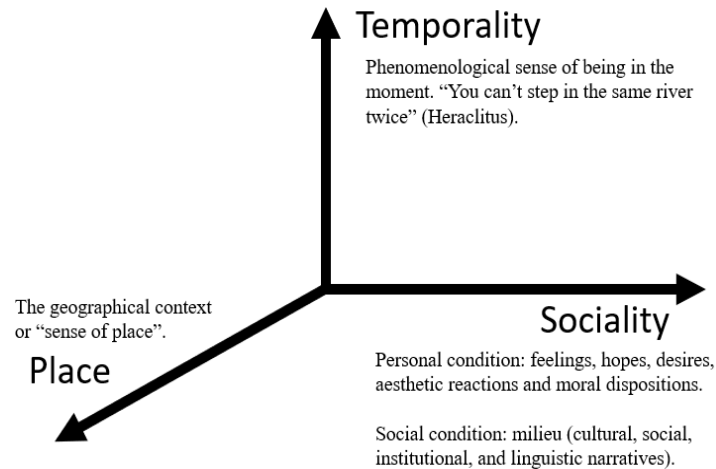


Figure 1. Narrative inquiry commonplaces

I used narrative inquiry to study Chinese international doctoral students' socialization experiences while retaining their authentic voices. Narrative inquiry allows for a more nuanced understanding of the experiences of Chinese international doctoral students compared to perceptions imposed by other stakeholders (L. Ye & Edwards, 2017). I applied the three-dimensional approach (Clandinin & Huber, 2010) to retell participants' stories throughout their doctorate journey. The three-dimensional approach is more holistic and provides a broad lens to learn about the interactions, past, present, and future experiences of individuals through time and space (Munday, 2019; Ollerenshaw & Creswell, 2002).

The appendix includes the interview protocol in both English and Mandarin Chinese. In other words, the interview questions in Chinese were translated from English. Moreover, I assigned aliases to the participants to ensure confidentiality and anonymity. I organized the findings into vignettes developed from the narratives. These narratives were collected from conversational interviews in Mandarin Chinese with the three individuals. After each interview, I translated the Chinese interview data into English.

POSITIONALITY: FROM THE INSIDE OUT

Positionality is defined as how our worldviews, identities, and philosophical assumptions interact with our research agenda and the broader social and political context (Holmes, 2020; Major & Savin-Baden, 2013). According to Mertens and Wilson (2019), our philosophical assumptions include axiology (ethics), ontology (reality), epistemology (knowledge), and methodology (systematic inquiry). I relied on a constructivist (social constructionism) paradigm to frame my research on the construction of a shared meaning-making process between me (the researcher) and participants. Social constructionism is an interpretive paradigm that emphasizes that reality is created collectively and knowledge is co-constructed through multiple values and perspectives (Given, 2008).

Moreover, positionality represents a space where objectivism and subjectivism meet (Bourke, 2014). On the one hand, as a Chinese cultural insider, my values bring certain strengths to the study and provide a unique perspective. For instance, there are advantages to my inherent experiences that provide greater insight into the phenomenon, such as my deep understanding of the Chinese language and culture. On the other hand, as an immigrant in American culture, I strive to balance the cross-cultural differences by creating a new sense of identity as a Chinese American woman. Throughout the research process, I am aware that my positionality will not only reflect how I engage with participants, but also guide my decisions for my research approach, data collection, and data analysis techniques.

POPULATION, SAMPLE, AND SAMPLING PROCEDURES

First, I selected participants from Mainland China who met the selection criteria. The selection criteria excluded international exchange students, postdoctoral scholars, or exchange scholars who are not obtaining a PhD degree. Second, I conducted conversational in-depth interviews with Chinese international doctoral students. The land grant university, located in a rural area in the northwest U.S., had only four Chinese international doctoral students as of Fall 2019. Participants were mainland Chinese students who are pursuing a doctoral degree in various disciplines. The lack of Chinese peers may make it especially important to understand their strengths in a context with limited cultural support. A university with limited Chinese peers, faculty, and community support creates navigational challenges for Chinese international doctoral students. This experience is quite different from Chinese international doctoral students at Cornell University or U.C. Berkeley or other urban institutions with a large Chinese international doctoral student community. This study did not include the one Taiwanese doctoral student due to political, cultural, and language differences. Third, I selected the research site because of the university's land-grant mission to support students from diverse populations.

I recruited participants using a combination of sampling techniques: convenience, purposive, and snowball sampling. Convenience sampling was used because of the ease of access to participants (Vanderstoep & Johnson, 2008). A purposive sampling strategy was used because this study only included Chinese international students who are obtaining a doctoral degree and they experience the three phases as described in Gardner's (2009) doctoral student identity development framework. Also, I used the snowball technique because participants are recruited through referrals by people who have access to potential participants or by participants who are already taking part in the research (Whitley & Kite, 2012). Table 1 shows the sociodemographic characteristics of the study sample. The sample included one female Chinese international doctoral student (Yang) from the education discipline, and two students, one male (Huang) and one female (Zhou), from the engineering discipline. Participants chose Chinese last names as their aliases for anonymity in the study.

Table 1. Sociodemographic characteristics of the study sample

NO.	PARTICIPANT PSEUDONYMS	SEX	PHASE OF DOCTORAL STUDY	PROJECTED GRADUATION	DISCIPLINE
1	Yang	F	Entry (first semester during doctoral program)	2023	Education
2	Huang	M	Candidacy (completed comprehensive exam and working on dissertation)	2022	Engineering
3	Zhou	F	Integration (completed coursework but not yet taken the comprehensive exam)	2022	Engineering

Qualitative research investigates phenomena in the context of individuals or groups (Moser & Korstjens, 2018). An important strength is that it allows me to focus on the specific group of doctoral students, considering the goal of understanding Chinese international doctoral students' experience.

DATA COLLECTION

Following Institutional Review Board (IRB) approval, I conducted in-depth interviews during the Fall 2019 semester and follow-up interviews at the beginning of COVID-19 during the Spring 2020 semester with three Chinese international doctoral students to understand their doctoral socialization

experiences. The appendix details the interview protocol and table of specifications aligning my interview questions with each research question. The protocol was developed and informed by the literature, narrative approach, and positionality in three important ways. One, the protocol was organized into sections based on the goal of the questions. For example, the first set of questions established rapport and context about Chinese international doctoral students' journeys, both of which aligned with my positionality and narrative approach. The second set of questions explored how Chinese international doctoral students identify salient features of identity throughout their cross-cultural socialization journey. The third set of questions explored how Chinese international doctoral students leverage strengths and multiple identities that shape their cross-cultural socialization journey. The third set of questions also aimed to understand how students viewed their strengths in the cross-cultural socialization process. Then, I pilot tested the interview protocol with four Chinese students who were not included in this study. The pilot test determined whether the interview questions were comprehensible and able to be completed within the given timeframe (Brazill, 2016).

I provided the participants with a choice of which language to conduct the interview, and they all chose to converse in their native language - Mandarin Chinese. As a native Chinese speaker, I am also aware of the importance of building a trusting relationship with the participants and listening to their stories fully (L. L. Ye, 2018). Table 2 shows that each interview lasted approximately 2.5-3.0 hours. Follow-up interview conversations were necessary due to the narrative inquiry nature of collecting in-depth data to further understand the rich narratives (Brazill, 2021; Major & Savin-Baden, 2013). Each follow-up interview lasted 2.0-2.5 hours. The total time for these conversational interviews was approximately 15 hours. The interviews took place at the researcher's office or the participants' homes. Interviews were audio-recorded with the participants' permission.

Table 2. Narrative conversational interview

NO.	PARTICIPANT PSEUDONYMS	ORIGINAL INTERVIEW	FOLLOW-UP INTERVIEW	TOTAL INTERVIEW HOURS
1	Yang	2.5	2.5	5.0
2	Huang	2.5	2	4.5
3	Zhou	3	2.5	5.5

ANALYTICAL STRATEGIES

My study relied on Nasheeda et al.'s (2019) restorying framework to transform transcripts into representations of stories for each participant. Nasheeda et al. (2019) developed a step-by-step progression for their restorying framework, which includes: (1) choosing interview participants, (2) transcribing and translating interviews, (3) familiarizing with the transcript, (4) chronologically plotting (elements of the story), (5) using follow-up interviews to collaborate with participants, and (6) developing the story through the three-dimensional narrative inquiry approach.

As a professional Chinese-English translator, I transcribed and translated the interviews from Chinese to English. Then, I identified how the rich interview excerpts/quotations reflected their multiple identities and supported individual vignettes to represent each participant's story. Each vignette emphasized how Chinese international doctoral students rely on their strengths to be successful. In methodological terms, when retelling the individual's story, I balanced these subjective and individual elements with more objective layers of abstraction and analysis drawn from the socialization literature.

AUTHENTICITY, TRUSTWORTHINESS, CREDIBILITY, TRANSFERABILITY, DEPENDABILITY, AND CONFIRMABILITY

I ensured validity and authenticity through communicating my research purpose, paradigmatic assumptions, and positionality. To improve internal and external validity, I established trustworthiness criteria (credibility, transferability, dependability, and confirmability) through several steps.

First, I memoed by keeping a reflexive journal and jotting reflective notes during the data collection and analysis stages. Second, to enhance credibility and internal validity, I conducted peer debriefing by inviting Chinese and American qualitative scholars to review my transcripts and codebook. Also, I triangulated data by using different data sources (multiple interviews). Additionally, I invited participants to validate the raw data and conduct member checks by providing interview transcriptions to participants for checking accuracy. I ensured prolonged engagement through building trust and investing time with participants (Lincoln & Guba, 1985). Third, to enhance transferability and external validity, participants reviewed the accuracy of my translation from Chinese to English. Though I did not utilize a formal process of validation or inter-rater reliability, I did invite another Chinese-English translator to review my translations. Fourth, participants also confirmed my interpretation and thick descriptions of the stories validated the authenticity of the narratives (Azzahrawi, 2021). Finally, I integrated participants' feedback into the individual vignettes to make sure the narrative stories accurately represented them. Though it is hoped that this study is generalizable, specific issues of how it can be generalized to other Chinese international doctoral students in other regions of the U.S. are beyond the scope of this study.

FINDINGS

Chase (2005) provided five different approaches to analyze living stories, which include psychosocial development, identity (how people construct themselves within institutional, cultural, and discursive contexts), sociological (focus on specific aspects of people's lives), narrative ethnography (stories that define group culture), and autoethnography (self-reflection to explore personal experiences).

In my findings, I applied Chase's (2005) second approach of identity to deconstruct how participants' made sense of their stories, multiple identities, and strengths to facilitate their doctoral journey. I studied Chinese international doctoral students using narrative inquiry to focus on their unique socialization experiences and authentic voices. The participants expressed their cultural strengths and strong personal attachments to aspects of their identities and what inspired them to pursue their doctoral programs. I organized the findings as vignettes to capture Chinese international doctoral students' cross-cultural socialization journey.

YANG'S VIGNETTE

As a unifying approach, narrative methodology provided ways to understand Chinese international doctoral students' interactions with American culture, place, and context. The three-dimensional approach (Clandinin & Huber, 2010) was used to retell Yang's story as shown in Table 3. Thus, the retelling of the story was a re-representation of Yang.

Yang's narrative indicated that her multiple identities are bi-directional and interactive. For example, her personal identity interacted with the strengths that she brought on her cross-cultural socialization journey. Also, her cultural identity as a Northern Chinese interacted with her linguistic and familial strengths. These strengths (aspirational, familial, linguistic, social, navigational, and resistance) helped her cultivate a stronger social and professional identity. As Yang expressed this:

My personal identity has changed as I have become more outgoing. Living in the U.S. and having experienced the doctoral journey in the U.S., I will interact with various people and things with more understanding and tolerance after returning home. My cultural background on the other hand is stronger because I understand both Chinese and American cultures. My

social identity will also change since I will be more open-minded, including politically, economically, and culturally. I see the world with more perspectives. The biggest change will be my professional identity because I will become an expert in my field through my PhD study.

Table 3. Retelling Yang's story: three-dimensional space (Ollerenshaw & Creswell, 2002)

INTERACTION		CONTINUITY			SITUATION
PERSONAL/ INWARD	SOCIAL/ OUTWARD	PAST	PRESENT	FUTURE	PLACE
Introverted, but occasionally did something unexpected such as being a tour guide in China. She was the person she hoped to be. She continued to reflect on her life and progress.	Her personality became more introverted or more extroverted depending on specific activities and environment. She often got together with other parents' who had young children similar to her son's age.	Her personality and family background were suitable for being a teacher, so she decided to pursue a PhD degree in education. Her mom was an educator and many relatives in her family were teachers.	She and her husband live apart as he worked in China and supported her study in the U.S. The English language was a daily hindrance to her PhD study and life in the U.S.	When she returns to China, she will have an advantage in terms of social and linguistic strengths over other Chinese peers who have not studied in the U.S.	Studying in the U.S., a small town in the Rockies, at a land grant university. Far away from family and friends in China. "Sociality" was limited since she was not able to interact with other Chinese students over tea or dinner, especially living in a place with few Chinese people and during the start of COVID 19.

During the conversational interviews, I invited Yang to describe each strength from "what was most important" to "what was least important" to her core identity and how they interact with her professional, personal, social, and cultural identities. After Yang described the importance of each of the six strengths, she shared stories behind why she ordered the strengths the way she did. These strengths symbolized what Yang perceived to help her successfully navigate her doctoral socialization journey. There are three notable and consistent strengths that remained salient throughout her educational journey, including the importance of family, personal resistance, and cultural linguistics, with family being the most central core strength for her identity. In Yang's words:

My familial strength remains to be the most important strength before my doctoral study, during the doctoral process and will continue to be after my graduation. The main reason that I decided to study in the U.S. is because of my family and their support.

Yang's narrative revealed how the different strengths that she cultivated under different contexts were unique and added to her story as a Chinese international doctoral student.

HUANG'S VIGNETTE

I used the three-dimensional approach to retell Huang's story as shown in Table 4. This approach captured the interactions, past, present, and future experiences of individuals through time and space (Clandinin & Huber, 2010). Thus, the retelling of the story was a re-representation of Huang.

Table 4. Retelling Huang's story: three-dimensional space (Ollerenshaw & Creswell, 2002)

INTERACTION		CONTINUITY			SITUATION
PERSONAL/ INWARD	SOCIAL/ OUTWARD	PAST	PRESENT	FUTURE	PLACE
Huang described himself as an introvert, gentle, and not irritable. He was the person he wanted to be, and his PhD journey was on the right track.	His personality was shaped by growing up in Hubei, a region that tends to be laid back and accepting of diversity, given the people of different dialects and social backgrounds that settled the Yangtze River flood plain. His family also shaped his personality.	He wanted to study in the U.S. since high school. The main reason he came to the U.S. was because of his family. His family gave him the choice to study in China or abroad, and he chose the U.S.	He kept in touch with his family and friends in China through WeChat video calls. They talked a lot about his daughter since his parents do not understand his research and PhD study.	When he returns to China, he will become more independent and will bring his knowledge back to China. He will have a stronger professional identity after returning to China because of his training gained in the U.S.	Huang shared that there were only a few Chinese international students here. Also, the space of being in a relatively small and isolated town in a remote U.S. state. The space was especially limiting since he was not an outdoors-oriented person and much of the social space is equated with nature.

Huang's personal and cultural identities interacted with the kinds of strengths that he brought on his cross-cultural socialization journey. For example, his personal identity was shaped by growing up in Hubei:

Hubei people tend to be more laid back and understanding of people who have different dialects, due to the Yangtze River flooding and migration. During ancient times flooding created fertile farmlands which attracted people from surrounding areas to grow food, although many people would perish. Migration, catastrophic disasters, and the natural barrier of the river resulted in many dialects and social identities.

Huang's familial strength enabled the development of his professional identity to grow into an expert scientist. Huang explained that:

The main reason I came to the U.S. was because of my family. My family provided me the choice to study in China or abroad, I chose the U.S. The most important factor is my family. I came here to start my undergraduate study. Without the support of my

family, I wouldn't be able to pay for tuition. Only when my family gave me the option could I choose to study in the U.S.

Familial strength was represented by the financial support from his family in China and the U.S. Along the same lines, Huang's social strength helped him cultivate a stronger social identity. For example, Huang's advice for new Chinese international doctoral students was to be "self-motivated learners, communicate regularly with their advisors, and try to find housing as soon as possible due to the shortage". Huang's suggestions aligned well with the practical aspects of his personal identity.

Huang's strengths (aspirational, familial, linguistic, social, navigational, and resistance) intersected with his personal, social, cultural, and professional identities before, during, and after the PhD. During our conversation, Huang described the strengths that he brought with him and cultivated during the PhD as well as the strengths he would value after the PhD. These strengths symbolized the assets that Huang identified as most salient for him to successfully navigate his cross-cultural socialization journey in three ways.

First, reflecting on the time before the PhD, Huang's aspirational and navigational strengths were vital and drove him to his pursuit of a doctoral degree in the U.S. In terms of linguistic strengths, he strived to improve his English skills, which he relied on to be successful in his career as a scientist. Moreover, Huang drew social strength from his interactions with friends in China. Although Huang's Chinese friends were now far away, he stayed connected socially by communicating through different spaces, time zones, and such social distances. As Huang said, "the Chinese social media app (WeChat) has made it possible for me to communicate with all my friends in China through video calls, voice memos, and instant messages."

Second, during the PhD process, Huang indicated that his familial strength became more salient because he became a parent of a little girl. His resistance strength also became more prevalent. As Huang described it, "I cultivated resistance strength throughout my PhD journey due to the psychological pressures and struggles navigating multiple identities."

Third, picturing Huang's life after his PhD, he thought his familial strength would continue to be the most important strength because of the time spent with his family and priority as a father. Huang explained, "I prioritize my family and want to be present for them because of my cultural identity as a Chinese person."

ZHOU'S VIGNETTE

I used the three-dimensional approach (Clandinin & Huber, 2010), as shown in Table 5, to retell Zhou's story. This approach was more holistic and provided a broad lens to learn about the interactions, past, present, and future experiences of individuals through time and space (Clandinin & Huber, 2010). Thus, the retelling of the story was a re-representation of Zhou.

During the conversational interviews, Zhou identified each cultural strength in what was least to most important to her core identity and how they interact with her professional, personal, social, and cultural identities. The rank of each strength before, during, and after her PhD was suitable to retell Zhou's journey through her engineering studies.

Zhou's aspirational and navigational strengths that she brought with her and developed on her cross-cultural socialization journey interacted with her personal and cultural identities and were most important to her core. For example, she had a sense of fate "yuán fèn 缘分" and she long aspired to weave Chinese and Western cultures and education systems together. She explained that:

My experience in the U.S. may broaden my life orientation and dreams. For example, I often take a broad view of Europe and America in my future study and life, not just China and the U.S. I have the capability to communicate with people from all over the world.

Table 5. Retelling Zhou's story: three-dimensional space (Ollerenshaw & Creswell, 2002)

INTERACTION		CONTINUITY			SITUATION
PERSONAL/ INWARD	SOCIAL/ OUTWARD	PAST	PRESENT	FUTURE	PLACE
Her best friend passed away in middle school (she cries while telling this) which made her an independent person and more introverted due to this experience. Her dad worked in a different city and left her home alone with her mom.	In the lab, she worked with two other Chinese friends who are now post-doctoral scholars at the same institution where she is pursuing her doctoral degree.	After her undergraduate education in China, she came to study in the U.S. because as a Lab Technician she got to know her PhD advisor in China. She wanted to study in the U.S. because of academic freedom.	She chose to continue her PhD in the U.S. because of her desire to be a U.S. trained scientist upon returning to China. To achieve her dreams, she worked very hard in her academic research and PhD coursework.	U.S. science education is highly regarded and respected in China, which will provide Zhou an advantage in her career in China. After her PhD, she would like to do a postdoc, become a professor, or be a researcher/scientist.	She enjoyed hiking on "The M" mountain, skiing, and attending rodeos with her American friends. These outdoor activities created a sense of belonging to the place, especially given the high value placed on outdoor recreation.

Regarding her navigational strengths, Zhou shared concerns about the high cost of living in the U.S., including parking permits, housing, insurance, and food. Money was a huge concern since she depended upon her meager GRA salary. Despite these challenges, her navigational strength helped her successfully navigate the process. Zhou's advice for new Chinese international doctoral students was to "develop their research interests, learn how to navigate the new culture and environment, and never give up".

In terms of her social and professional identities, Zhou wished there was more gender diversity in her lab and indicated that writing, reading, and mentoring support are vital in her doctoral journey. Worth noting is that Zhou's strong professional identity as an engineer interacted with her aspirational, resistance, and linguistic strengths. As Zhou expressed it, "my social identity intersects with my linguistic strength as mastering English has helped me cultivate social relationships with my American peers and professors".

DISCUSSION

My purpose in this narrative inquiry was to learn how Chinese international doctoral students leverage their identities as strengths in their cross-cultural socialization journey. The findings answered the research questions twofold. First, Chinese international doctoral students described the way their multiple identities – including personal, social, cultural, and professional identities – shape their social interactions with peers, faculty, and the institution. Second, the common themes that emerged from the findings highlight how Chinese international doctoral students express their strengths in their

cross-cultural socialization experiences. For instance, the three Chinese international doctoral students all found that their aspirational strength was vital for their cross-cultural socialization journey. In addition, familial strengths (family members) served as supporters and mentors for Chinese international doctoral students because of the deep connection and trust built through shared experiences. Moreover, social strengths were reflected in Chinese international doctoral students' interactions with both white and non-white faculty, peers, and friends.

Notably, the findings suggested that linguistic strengths were an important way for fostering Chinese international doctoral students' multiple identities and to empower their strengths in American higher education. Thus, students should be encouraged to communicate in their own language while also practicing and using English. One specific recommendation is for mentors to understand how being bilingual or multilingual can be an asset to other students and the field.

Potential xenophobia, hostilities because of American trade policies, Presidential remarks, and the COVID-19 pandemic have contributed to prejudice and racism against Chinese international students (Brownell, 2020; Xu et al., 2021). Even before the COVID-19 pandemic, former President Trump accused Chinese students in the U.S. of being spies (Redden, 2018) and his administration accused Chinese students of stealing U.S. intellectual property (Voice of America, 2019). Culturally attuned language choice is vital to support Chinese international doctoral students (Brazill, 2021). Likewise, it is problematic that Asian students are often viewed as a homogeneous group, and much prior research has emphasized the traditional deficit perspective in explaining how Chinese students must adjust and assimilate to the university environment (Minero, 2020). Findings from this study shift the narrative from the deficit view to a strength-based perspective as to how Chinese international doctoral students can rely on their cultural values and identities as strengths to be successful academically, socially, and emotionally (Brazill, 2021).

Since the completion of this study, the linguistic issues and related issues of racism and prejudice were exacerbated by former President Trump's rhetoric about COVID-19 as the "Chinese Virus" (Chiu, 2020), and executive leadership actions may have increased anti-Asian hate crimes (Gover et al., 2020). To address this and similar challenges, another important aspect of my study was Chinese international doctoral students' navigational and resistance strengths. On the one hand, Chinese students could rely on their strengths to navigate current affairs and lived experiences, such as the post-study issues related to the COVID19 pandemic and increased prejudice and racism. On the other hand, faculty and peer mentors can also support Chinese international doctoral students' navigational and resistance strengths by having meaningful culturally attuned conversations. These conversations could include: (1) how will Chinese international doctoral students use their degrees back in their home country? (2) what will it mean for Chinese international doctoral students returning to homeland China? and (3) what opportunities or challenges do Chinese international doctoral students foresee and how can they address them now?

Findings related to the literature in two important ways. First, the findings supported how the six cultural strengths (aspirational, linguistic, familial, social, navigational, and resistance) of Yosso's (2005) community cultural wealth apply to Chinese international doctoral students. Chinese students' stories aligned with these strengths and through these strengths they explore and develop their personal, social, cultural, and professional identities. Second, Chinese students' stories as a counternarrative challenged and contradicted the essentialist view and misconception that Chinese students are a homogeneous group personally, socially, culturally, or academically. The narrative retellings were unique for each individual, further emphasizing that Chinese international doctoral students are not a homogeneous group. No two individual Chinese students are the same, and the monolithic and deficit approach to view all Chinese students as one single narrative is no longer acceptable.

Yosso's (2005) community cultural wealth aligned with my analysis of Chinese international doctoral students in terms of the importance of looking at these individuals' six cultural strengths and the

positive interaction with their multiple identities. However, one limitation in this framework for understanding Chinese international doctoral students is that there may be an additional strength (perhaps “transitional strength”) needed for Chinese international doctoral students before, during, and after the PhD programs.

LIMITATIONS

Some limitations of the study are that it was conducted by a single researcher, the sample size was small, and the sample came from a single university. However, narrative inquiry is typically used for small groups and even for a single participant (Chan, 2009; Clandinin & Connelly, 2000; Creswell & Poth, 2018). A related limitation is that, like any narrowly focused qualitative study, it can have low generalizability.

FUTURE RESEARCH

For future research, the generalizability should be tested against larger sample sizes at more American universities. Additionally, gender and other demographic variables could be explored. Also, it would be important to address specific issues in my findings regarding the identities of Chinese international doctoral students. These identity issues might include the relative ranking of the doctoral students’ Chinese undergraduate universities, the geographical location of those universities within the large and regionally complex nation that is China, and the affiliation of students with any of China’s 55 officially recognized ethnic minorities.

CONCLUSIONS

In conclusion, this study explored a strength-based socialization perspective for how Chinese international doctoral students engage in cross-cultural socialization. The strength-based perspective included constructs such as multiple identities and strengths of Chinese international doctoral students’ cross-cultural experience.

This narrative inquiry contributes to the field of international doctoral students in three unique ways. First, it explores a strength-based understanding for how Chinese international doctoral students use their cultural strengths and how these strengths intersect with their multiple identities. Second, linguistic strengths are particularly important for Chinese international doctoral students’ success in their cross-cultural socialization journey. Therefore, students should be encouraged to communicate in their own language while also practicing and using English in developing their professional identity. Furthermore, a vital recommendation is for mentors or faculty to understand how being bilingual or multilingual can be an asset to other students and the field. For example, the Chinese language is a strength that supports Chinese students’ personal, social, cultural, and professional identity development in the cross-socialization process. These bilingual students can access resources such as Chinese literature that provide them with broader content and multi-cultural perspectives. Third, navigational strength also fosters Chinese international students’ cross-cultural socialization. Faculty and administrators are especially important agents to support students’ navigation before, during, and after their doctoral journey. This navigational support could result in significant gains for retention, the social well-being of Chinese international doctoral students, and future recruitment.

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APPENDIX: INTERVIEW PROTOCOL (访谈问题大纲)

Rapport Building with Chinese International Doctoral Students	Interview Question Part I - Questions about family and social background. 询问关于参与者的家庭和社会背景信息。 - Questions about choice of doctoral degree in the U.S. and general experience. 询问关于参与者在美攻读博士学位的基本情况和历程。
Research Question 1 What do Chinese international doctoral students identify as most salient to who they are throughout their cross-cultural socialization journey?	Interview Question Part II <u>Personal Identity:</u> Can you share stories of how you grew up and formed your personal identity (e.g., stories about childhood, schooling, or things you remember, etc.)? 能否分享一下有关你个人成长和对你性格形成有影响的故事？（例如，童年、上学或你记忆深刻的事情） <u>Personal Identity:</u> Please describe yourself. Who are you as a person now? How do you think you became who you are now? Are you the person you want to be? 请描述一下你自己。你认为你现在成为了什么样的人？你是如何成为现在的你的？现在的你是你所期望成为的样子吗？ <u>Professional Identity:</u> Can you please share the most important reason that you wanted to do your PhD in the U.S.? Why not China or another country? When did you first begin thinking about studying in the U.S.? 能否阐述一下你选择在美国攻读博士学位的最重要原因？为什么不选择在中国或其他国家就读？你最开始是什么时候打算来美国学习的？ <u>Professional Identity:</u> Have you completed your doctoral courses, comprehensive exam, or dissertation? 你是否完成了博士课程、或者综合考试或者论文？ <u>Professional Identity:</u> What are your career plans for after your PhD? 博士毕业后你的职业规划是什么？ <u>Cultural Identity:</u> What role does Chinese culture play in your doctoral experience? 中国文化在你的博士攻读经历中起到什么作用？ <u>Social Identity:</u> How is your relationship with your family and friends in China during your PhD in the U.S.? Do you keep in touch with them often? Have you noticed any changes in your Chinese relationships? If so, tell me more about that. 在美国攻读博士学位期间，你与中国的家人和朋友之间的关系保持得如何？经常与他们联系吗？来美国以后，你与

	中国的家人或朋友的关系发生了什么变化吗？如果发生了变化，请说明。
Research Question 2 How do Chinese international doctoral students describe the way they leverage their strengths and multiple identities in shaping their cross-cultural socialization journey?	Interview Question Part III - What or who motivates you to pursue your doctoral program? 什么原因或者是谁促使你攻读博士学位？ - How much do your faculty and peers know about Chinese culture and language? 你的教授和同学对中国文化和语言了解多少？ - Can you describe each strength (linguistic, aspirational, familial, social, navigational, and resistance) from “what was most important” to “what was least important” to your core identity and how they interact with your personal, social, cultural, and professional identities? 请描述以下文化因素对你在美国读博士的有利程度，从最重要到最不重要？（你能掌握不同语言、你的抱负、你的家庭关系、你的社会关系、你的人生导向、以及你克服困难的斗志）？这些因素如何与你的个人身份、社会身份、文化身份以及博士身份相互影响？ - What do you think you will bring back to China from your American experiences? Do you feel as if your American experience might have changed you in any way? What might be different for you in China when you go back? 回到中国时，你认为你在美国的就读经历能给你带来什么？是否觉得在美国的经历在某些方面可能改变了自己？回到中国后你可能会产生哪些不同之处？ Closing Remarks - What advice would you give to a new Chinese international doctoral student? 你会给新来的中国博士留学生什么建议？ - Is there anything else related to your doctoral experience that you would like to tell me about? 关于你的博士经历，你还有什么要补充的吗？

AUTHOR



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Her current research examines higher education outcomes and academic experiences of minoritized students. Her multicultural experiences have shaped her research goals to build a more just society through improved educational success for diverse students and helping dominant groups practice multicultural inclusion. Her publications and presentations include sole-authorships and co-authorships with colleagues. She has published on translation studies, multicultural education, diversity and identity in E-learning, curriculum design, inclusive education, web-based pedagogy, and American Indian and international graduate students' socialization experiences.

CHAPTER SIX

SUMMARY AND CONCLUDING REMARKS

Chapter Six of my three-article dissertation provides a synthesis of the three empirical studies as shown in Chapters Three through Five. These earlier chapters provided detailed findings as published in the individual articles, whereas Chapter Six, I circle back to the overarching themes of the three articles and my unique contribution to the literature. In other words, I will provide an overview for how these studies inform one another and how the findings contribute to other literature as described in Chapter One and Two.

In my research, I use quantitative and qualitative methodological approaches to investigate the cross-cultural socialization experiences of AI/AN graduate students and Chinese international doctoral students. I am passionate about studying how student identities and strengths shape their academic experiences and social interactions with faculty, peers, and the university environment. All three articles utilize a strength-based perspective, which guides recommendations and directions for future research in higher education. Throughout these concluding remarks, I will discuss the collective and distinctive findings and implications.

Scope of the Three-Article Dissertation

Across my publications, I employed a strength-based approach to explore cross-cultural socialization processes for AI/AN graduate students and Chinese international doctoral students. In Chapter One, I introduced the common threads that linked all three studies thematically. In Chapter Two, I shared my positionality/self-location statement and how my cross-cultural values guide my research approaches. The quantitative research in Chapter Three focused on cultural

congruity and academic confidence of AI/AN graduate students in STEM. The qualitative study in Chapter Four explored the line of inquiry as “how Chinese international doctoral students use cultural strengths (aspirational, linguistic, familial, social, navigational, and resistance) as leverage in their cross-cultural socialization experiences?” Finally, the narrative inquiry in Chapter Five further explored how Chinese international doctoral students leverage strengths and multiple identities during their cross-cultural socialization journey.

Synergy Across Three Publications

In the three studies, I explored important cross-cultural socialization constructs, such as cultural congruity, academic confidence, peer, faculty, and institutional interactions, cultural capital, cultural strengths, and multiple identities. Each article presents unique findings that contributed to my thinking synergistically to the dissertation process. Collectively, the findings from these studies connect to each other in comprehensive and cohesive fashion. Much of the existing literature on graduate education comes from a deficit perspective, which I found problematic because it blames individuals based on their family backgrounds, languages, or culture knowledge (Valencia, 2010). Given the pervasive nature of systemic racism in American higher education, this deficit model is a classic “blame the victim” approach (Davis & Museus, 2019). Instead, my articles emphasized on the strengths that graduate students bring with them and develop during their cross-cultural socialization journey. Independently, each study uses the strength-based lens, which in turn illuminates new findings as well as broader implications.

The first article relied on a critical quantitative lens to examine the cultural congruity and academic confidence of AI/AN students. Parts of this study, *Cultural Congruity and Academic Confidence of American Indian Graduate Students in STEM: Peer Interactions, Mentor Cultural*

Support, and University Environment Fit, were presented at peer-reviewed international conferences. In 2021, it was published in the *Journal of Diversity in Higher Education*. This article aimed to understand processes germane to AI/AN graduate students' transcultural socialization in STEM. We hypothesized that socialization components, including peer interactions, mentor's cultural support, and university environment fit, would facilitate academic confidence and cultural congruity. Our results found elevated levels of cultural congruity among those students who reported more favorable peer interactions, but the simultaneous experiences of mentor's cultural support and university environment fit did not reveal such an influence. Students reported greater levels of academic confidence in the presence of mentor's cultural support and university environment fit but not for peer influence. We situated these findings within prior research and recommendations for programs and practices where universities, peers, and mentors can provide cultural support, inspire academic confidence, and further enhance the well-being through honoring the cultural strengths of AI/AN students.

The second article was a qualitative study that used narrative inquiry to understand the cross-cultural socialization experiences of three Chinese international doctoral students at a Land Grant university in the U.S. Parts of this study, *Narrative Inquiry into Chinese International Doctoral Students' Journey: A Strength-based Perspective*, were also presented at peer-reviewed international conferences. In 2021, it was published in the *International Journal of Doctoral Studies*. This study relied on a strength-based approach to study the cross-cultural socialization journey of Chinese international doctoral students. Previous research employed a deficit perspective to study Chinese students and how they should adapt to the new academic and social environment. Instead, my unique contribution was using narrative inquiry study to explore cross-

cultural socialization and mentoring practices that are congruent with the cultural capital that Chinese international doctoral students bring with them. Through multiple conversational interviews, artifacts, and vignettes, the study captured the doctoral journey of Chinese international students' experiences. My findings suggest that Chinese international doctoral students practice various forms of cultural capital (aspirational, linguistic, familial, social, navigational, and resistance) as leverage in their cross-cultural socialization doctoral journey.

The third narrative inquiry study built upon the second research article to further understand Chinese international doctoral students' cross-cultural socialization experiences. I presented parts of this study, *Chinese International Doctoral Students' Cross-Cultural Socialization: Leveraging Strengths and Multiple Identities*, at peer-reviewed international conferences. In 2022, it was published in the International Journal of Doctoral Studies. Narrative inquiry helps to interpret Chinese international doctoral students' stories and how they leveraged their strengths and multiple identities in socializing to graduate education. My findings suggested that cultural strengths helped to empower Chinese students and develop their personal, social, cultural, and professional identities during their graduate study.

Research on Chinese students often treats and categorizes individuals as a homogeneous group. Furthermore, existing research interprets the experience of Chinese students from a place of deficiency. However, my findings challenge this notion. Upon reflection, it was through listening to students' stories and engaging them with questions that inspired me to reveal where their strengths come from and how these strengths have helped to cultivate multiple identities to navigate the complex terrain of becoming experts.

Implications and Recommendations

The PhD dissertation is often viewed as a final product, evidence of one's expertise, and the beginning of the professional research agenda (Gardner, 2009; Lovitts, 2007). In the U.S., education doctoral candidates often follow the traditional dissertation approach. However, education research is inherently interdisciplinary when compared to other academic fields. Therefore, the three-article dissertation format provided a unique opportunity to apply multiple methodologies and theories to address my overarching research questions. In other words, the heart of these research questions called me to apply various research approaches, methodological choices, and theoretical perspectives. Moreover, this process challenges me to be a scholar with the capacity to develop multiple areas of expertise and emerging transdiscipline when it is needed. To this end, the impacts of my three-article dissertation carry multiple implications, including implications for research and practice for the field.

Implications for Research

My three-article dissertation advocates for culturally diverse graduate students by integrating the strength-based lens as a common theme throughout the three studies with distinct epistemological, theoretical, and methodological perspectives. Alternatively, as a methodological choice I used two different datasets, one secondary data analysis and one collected by myself for two racially diverse populations with one common lens. My research challenges the deficit perspective that depends upon essentializing students, neglects within-group diversity, and fails to validate diverse students' cultures. My approach advocates for leveraging these students' strengths that originate from within their cultures, communities, and identities. My findings

contributed to the existing literature and also have implications for embracing AI/AN and Chinese student diversity instead of thinking of them as monolithic groups.

Research considers graduate students' formal socialization as a vital aspect of academic success (Gardner 2010; Gardner & Barnes, 2007; Golde, 1998). However, AI/AN graduate students and Chinese international doctoral students carry a double burden. They not only need to know the White/Eurocentric norms of their academic programs, but also need to socialize without losing their original identity. In a broader sense, of course, it is likely that this double burden applies to all students from the non-dominant culture. In STEM, these non-dominant cultural groups might include international students, AI/AN students, and students of color.

Additionally, findings from my three-article dissertation offer insights for practitioners into what institutions could do to better support AI/AN and Chinese international doctoral students in their cross-cultural socialization journey. AI/AN, Chinese international students, and other diverse learners may benefit from peer, faculty mentors, and institutions in different ways. Therefore, understanding the unique cross-cultural socialization experiences and strength-based perspective will help foster an inclusive learning environment for each student.

Implications for Practice

Minoritized students may try hard to understand American university culture and it is also helpful if peers, faculty, and staff understand that these students (indeed, all students) have individual as well as a broader cultural identity. When higher education views students from the strength-based perspective and values their voices and agency, students will have more favorable socialization experiences and greater congruity with the university environment. Indeed, cultural congruence contributes to personal and intellectual growth such as changing goals and

perspectives, building relationships with American peers, learning to navigate American culture, and persevering through difficult times (Moore & Popadiuk, 2011). It is important to view graduate students as bringing individual and cultural strengths that increase campus diversity and add various worldviews to classroom discussions, research excellence, and international scholarship (Lee & Rice, 2007). This is a rich opportunity for U.S. universities, but institutions need to provide services to students that support their socio-cultural and professional development.

Institutions share responsibility for honoring individual student strengths and should not blame students for their inability to assimilate (González, 2006). For example, it is considered “cultural suicide” to discourage students from speaking their native language and make them abandon their old identities to fit into a new (to them) university environment. Students who refuse to assimilate when transitioning to American universities actually perform better than those who assimilated based on Tierney’s concept of “cultural integrity” (Renn & Reason, 2013). Academic confidence can be undermined when students are forced to abandon their original identity and culture (Weidman et al., 2020). My research findings support the literature, emphasizing that faculty should encourage students to remember where they came from. Students should be proud of their cultural identity even as they forge a new identity and understand that inner cultural strengths allow them to persist. For instance, the Chinese metaphor of bearing hardship or “eating bitter (吃苦 Chī kǔ)” is deeply rooted in Chinese culture and this traditional value helps Chinese international doctoral students persist. This means that although they expect to have bad experiences, they do not let these bad experiences define their identity or cause them to quit. During the socialization process, these qualities and cultural connections can

be used as strengths to cope with challenges. Indeed, my own cross-cultural socialization journey as a Chinese American woman in the U.S. is full of “eating bitter (吃苦 Chī kǔ)”; yet my cultural strengths motivate me to persist and strive for excellence.

To address broader implications and extend the findings from my three-article dissertation, I propose the following practical recommendations to three stakeholders, that is faculty, administrators, and staff. My recommendations are based on my findings and the literature, and align with the iterative aspects of the strength-based cross-cultural socialization perspective by: (1) validating the strengths (cultural values) that students bring with them to graduate programs and develop through their socialization journey (Otters, 2012; Véliz, 2020); and (2) defining the role each stakeholder plays in empowering students in socializing to graduate school (Gardner & Doore, 2020). Strength-based cross-cultural socialization aligns with Chickering and Reisser’s (1993) synthesis of respect for strengthening identity development and empowering individuals to flourish (Fenton, 2008; Lopez & Louis, 2009).

Practices for Faculty

In this section, I provide promising practices for faculty to mentor culturally diverse graduate students. Faculty should recognize the tensions between AI/AN graduate students and Chinese international doctoral students’ cultural values and congruence with dominant White academic norms, and embrace mentoring practices so that students feel validated and do not have to surrender their identities (Thomas et al., 2007). It is important to recognize the cognitive, epistemological, psychosocial, and emotional development of students and to look at mentoring as a two-way socialization perspective, emphasizing responsibilities for both the mentors and mentees (Gardner & Mendoza, 2010; Weidman et al., 2020). Culturally aware mentoring

includes both what mentors and mentees contribute to the “reciprocal relationship” (Blake-Beard, 2001). Strengthening of cultural identity is a strong contributor to successful cross-cultural socialization for graduate students; and faculty can implement the following practices to support students:

- Mentor students with a student-centered and strength-based approach. For example, value students’ ethnic identity, respect their cultural values, worth, ability, and communication styles.
- Communicate explicit expectations and processes regarding their graduate socialization journey. For example, ask questions, facilitate conversations, and offer opportunities for teaching, research publications, and community engagement.
- Value diversity and the strength-based mentoring lens: incorporate culturally relevant practices that validate diverse ways of knowing. For example, linguistic variability is a form of strength and should not be perceived as a deficit or disability.
- Advocate for diverse students regarding social, cultural, and professional issues. For example, schedule weekly check-in time to support students with their academic success and wellbeing.

Policy for Administrators and Suggestions for Staff

In this section, I provide policy suggestions for administrators and staff regarding how to best mentor culturally diverse graduate students. Research (Ahmed, 2012; Espino & Zambrana, 2019; Gardner & Mendoza, 2010; Johnson et al., 2017; Rankin & Reason, 2008; Sanyal et al., 2016; Weidman et al., 2020) shows that it is vital to create meaningful culturally aware practices that are consonant with graduate students’ identities. Based on empirical findings from my

dissertation, the following policies implemented by administrators and staff will better support students:

- Embrace cultural humility and avoid prejudice and stereotypes regarding students, such as the model minority myth for Chinese international doctoral students (Poon et al., 2016).
- Allocate funding to provide culturally responsive programs and professional development opportunities. For example, administrators need to prioritize resources for sustainable programming.
- Motivate staff and faculty efforts with rewards, such as certificates, incentives, or tenure/promotion to encourage their responsiveness to diverse graduate students' needs.
- Provide a wide variety of support for AI/AN and international graduate students, such as strong mentoring programs and workshops/seminars that provide accurate information and equitable resources.
- Foster care and wellbeing through specialized programs that provide culturally attuned mentoring, career, academic, and social support. For instance, job marketing coaches for graduate students coming from diverse cultural backgrounds.

These recommendations have agential properties to inform stakeholders about culturally attuned practices. Some challenges and opportunities include: (1) understanding how students' cultural identity shapes their cross-cultural socialization experiences and (2) building upon students' identities as well as their mentors' cultural backgrounds. By adapting these strategies, higher education continues to create a diverse, supportive, and inclusive environment for

graduate students that will help students develop a sense of belonging, improve socialization experiences, and facilitate degree completion.

Contributions and Future Inquiry

As highlighted in the synthesis of key findings above, my three-article dissertation contributes to the literature by utilizing a strength-based lens. Institutional agents have a responsibility to promote personal growth, academic growth, cultural integrity, and wellbeing of culturally diverse students, including AI/AN graduate students and Chinese international doctoral students. By recognizing the intellectual and cultural strengths of minoritized students, we help create a vibrant, intellectual, safe, caring, and culturally diverse place for all students. Students from both minoritized cultures and the dominant culture can draw strength from their identity in ways that improve learning and help them thrive personally and professionally. I hope that scholars in higher education continue to explore this line of inquiry for minoritized students from diverse backgrounds.

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APPENDICES

APPENDIX A

PNW-COSMOS GRADUATE STUDENT EXPERIENCES SURVEY

AGEP Survey

Q1 As a person who is pursuing a graduate degree in a Science, Technology, Engineering, and Mathematics (STEM) program, you are among the highest achieving students in universities across the country. In an effort to inform existing knowledge and practice, you are invited to participate in this online survey that is a part of a National Science Foundation (NSF) Alliances for Graduate Education and Professoriate (AGEP) sponsored research project (HRD's-1432694, 1432910, 1431773, 1432932).

Attitudes towards and strategies for educational success among students in STEM graduate programs in the United States is a primary focus of the survey. It also examines how culture and ethnicity impact student learning and success outcomes at the graduate level. Questions on the survey are organized in to three sections. It is anticipated that the survey will take approximately 30 minutes to complete.

Participation is voluntary and responses will be kept confidential to the degree permitted by the technology being used. Submission of the survey will be interpreted as your informed consent to participate and affirmation that you are at least 18 years of age. No personally identifiable information will be used in any reporting of the information that you provide. Any reporting of the data gathered will be done in a summary format to protect the privacy of participants.

The results from the research will be shared with the NSF. Summary findings from the survey may appear on the NSF webpage and shared with current and/or pending AGEP award recipients. Summary findings will be used in research papers and reports that are intended to inform the educational, researcher, and practitioner audiences to better understand the factors that influence attitudes towards and strategies used by students in STEM programs.

If you have any questions about the research, please contact Principal Investigator, Dusten Hollist, Ph.D. via email at dusten.hollist@mso.umt.edu or via telephone at (406)-243-2843.

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As your progress through the survey, you may need to scroll down occasionally in order to proceed to the next screen. You can use your mouse, down arrows, or the slide bar to the right of your screen to scroll down. Click on the red box with white arrows found in the bottom right of the white box to move to the next screen throughout the survey.

☐ Yes, I have read/been read the above information and would like to participate in the research.

☐ No, I do not wish to participate in the research.

If No, I do not wish to participate is selected, then skip to end of survey.

Q2 Section One: Background The questions in this section ask you to provide some background information about yourself.

Q3 What department are you currently a student in? (Please list department name in the space below).

Q4 What is your ethnicity?

- ☐ Arab/ Middle Eastern
- ☐ Asian/ Pacific Islander
- ☐ Black/ African American
- ☐ Hispanic/Latinx
- ☐ American Indian/ Alaska Native
- ☐ White/ Caucasian
- ☐ Other (Please list in box below) _____

Q5 Which of the following is the degree type you are currently pursuing?

- ☐ Master's
- ☐ Doctoral

Answer If Which of the following is the degree type you are currently pursuing? Master's Is Selected

Q6 Which of the following academic milestones have you completed towards your Master's degree? Check all that apply.

- ☐ Thesis Committee chosen
- ☐ Thesis proposal successfully completed
- ☐ Thesis completed and approved by committee
- ☐ Thesis defended successfully and approved by committee
- ☐ Thesis submitted to the Graduate School

Answer If Which of the following is the degree type you are currently pursuing? Doctoral Is Selected

Q7 Which of the following academic milestones have you completed towards your PhD? Check all that apply.

- ☐ Coursework completed
- ☐ Committee chosen
- ☐ Completion of oral/written comprehensive exams
- ☐ Dissertation proposal completed and approved
- ☐ Dissertation completed and approved by committee
- ☐ Dissertation successfully defended and approved by committee
- ☐ Dissertation submitted to the Graduate School

Q8 What year are you in your current program of study?

- ☐ 1st year student
- ☐ 2nd year student
- ☐ 3rd year student
- ☐ 4th year student
- ☐ 5th year student
- ☐ more than 5 years in program

Q9 Have you ever taken a semester or more break from school while pursuing your current degree?

- ☐ Yes
- ☐ No

Answer If Have you ever taken a semester or more break from school while pursuing your current degree? Yes Is Selected

Q10 Have you taken more than one break from pursuing your current degree?

- ☐ Yes
- ☐ No

Answer If Have you ever taken a semester or more break from school while pursuing your current degree? Yes Is Selected

Q11 Including all breaks, how many semesters total have you taken off from pursuing your current degree? (Please enter in a numerical value, like 1 for one semester total, 2 for two semesters total, and so on).

Q12 How important are the six items listed below to you?

	Extremely Important	Very Important	Neither Important nor Unimportant	Very Unimportant	Not at all Important
Being identified as a member of the community where I grew up.	☐	☐	☐	☐	☐
Being identified as a member of the family I grew up with.	☐	☐	☐	☐	☐
Being identified as scientist.	☐	☐	☐	☐	☐
Being identified as a graduate of the University that I currently attend.	☐	☐	☐	☐	☐
Being identified as someone who shares their knowledge with their community.	☐	☐	☐	☐	☐
Being identified as a member of the academic department I am seeking a degree in.	☐	☐	☐	☐	☐

Q13 What is your PARENT(S) highest level of education? Please specify if Parent-1 is your mother or father, and if Parent-2 is your mother or father by typing your choices in the spaces provided below.

[illegible]

Q19 For each of the following items, indicate the extent to which you have experienced the feeling or situation at the university you are currently attending.

[illegible]

Q20 Please indicate to what extent you agree that the following statements about faculty/staff at the university you currently attend are true.

[illegible]

Q21 Please indicate to what extent you agree that the following statements about the university you currently attend are true.

[illegible]

Q22 Please indicate to what extent you agree or disagree with the following statements about your personal development while attending your current university.

	Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
Since coming to this university I have developed close personal relationships with other students.	☐	☐	☐	☐	☐
The student friendships I have developed at this university have been personally satisfying.	☐	☐	☐	☐	☐
My interpersonal relationships with other students have had a positive influence on my personal growth, attitudes, and values.	☐	☐	☐	☐	☐
My interpersonal relationships with other students have had a positive influence on my intellectual growth and interests in ideas.	☐	☐	☐	☐	☐
It has been difficult for me to meet and make friends with other students.	☐	☐	☐	☐	☐
Students would be willing to listen to me and help if I had personal problems.	☐	☐	☐	☐	☐
I am more likely to attend a cultural event (for example, a concert, lecture, or art show) now than I was before coming to this university.	☐	☐	☐	☐	☐

Q23 Please indicate to what extent you agree or disagree with the following statements about classroom interactions with the faculty that you have interacted with while attending your current university.

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
My classroom interactions with faculty have had a positive influence on my personal growth, values, and attitudes.	☐	☐	☐	☐	☐
The faculty members I have contact with are generally interested in students.	☐	☐	☐	☐	☐
The faculty members I have had contact with are generally outstanding or superior teachers.	☐	☐	☐	☐	☐
The faculty members I have had contact with are genuinely interested in teaching.	☐	☐	☐	☐	☐

Q24 Please indicate to what extent you agree or disagree with the following statements about non-classroom interactions with the faculty that you have interacted with while attending your current university/college.

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
My non-classroom interactions with faculty have had a positive influence on my personal growth, values, and attitudes.	☐	☐	☐	☐	☐
My non-classroom interactions with faculty have had a positive influence on my career goals and aspirations.	☐	☐	☐	☐	☐
Since coming to this university I have developed a close personal relationship with at least one faculty member.	☐	☐	☐	☐	☐
I am satisfied with the opportunities to meet/interact informally with faculty.	☐	☐	☐	☐	☐
The faculty members I have had contact with are willing to spend time out of class to discuss issues of interest and importance to students.	☐	☐	☐	☐	☐
The faculty I have had contact with are interested in helping students grow in more than just academic areas.	☐	☐	☐	☐	☐

Q25 Please indicate to what extent you agree or disagree with the following statements about your academic and intellectual experiences while attending your current university/college.

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
I am satisfied with the extent of my intellectual development since enrolling in the university.	☐	☐	☐	☐	☐
I am satisfied with my academic experiences at this university.	☐	☐	☐	☐	☐
My courses this year have been intellectually stimulating.	☐	☐	☐	☐	☐
My academic experience has had a positive influence on my intellectual growth and interests in ideas.	☐	☐	☐	☐	☐
I have performed academically as well as I anticipated I would.	☐	☐	☐	☐	☐

Q26 Do you regularly seek guidance from your major professor/committee chair?

- ☐ Yes
☐ No

Q27 Please indicate to what extent you agree or disagree with the following statements about your major professor/committee chair.

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Is regularly available for advising.	☐	☐	☐	☐	☐
Meets with me to discuss research.	☐	☐	☐	☐	☐
Is interested in my goals and projects.	☐	☐	☐	☐	☐
Provides constructive criticism on my project/research.	☐	☐	☐	☐	☐
Returns my work in a timely manner.	☐	☐	☐	☐	☐

Q28 Please indicate to what extent you agree or disagree with the following statements about your major professor/committee chair.

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Is interested (engaged) in my culture.	☐	☐	☐	☐	☐
Is interested in me beyond my academic role (what I can contribute academically).	☐	☐	☐	☐	☐
Is tolerant about any cultural differences between us.	☐	☐	☐	☐	☐
Appreciates cultural diversity.	☐	☐	☐	☐	☐
Is friendly toward my family.	☐	☐	☐	☐	☐

Q29 Please indicate to what extent you agree or disagree with the following statements about your academic and intellectual experiences while attending your current university/college.

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
It is important for me to graduate from college.	☐	☐	☐	☐	☐
I am confident that I made the right decision in choosing to attend this university.	☐	☐	☐	☐	☐
It is likely that I will register at this university next term.	☐	☐	☐	☐	☐
It is not important to me to graduate from this university.	☐	☐	☐	☐	☐
Getting good grades is not important to me.	☐	☐	☐	☐	☐

Q30 To what extent do you agree or disagree with the following statements about your STEM graduate student experiences in your current program.

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
My experiences in STEM are shaped by my cultural meaning systems.	☐	☐	☐	☐	☐
I have a strong cultural identity that guides the meanings that I attach to my interest in STEM.	☐	☐	☐	☐	☐
It is important for me to see how my culture of origin aligns with the STEM environment.	☐	☐	☐	☐	☐
I experience very few cultural conflicts with my STEM education.	☐	☐	☐	☐	☐

Q31 To what extent do you agree or disagree with the following statements about STEM graduate student experiences. Depending on your computer, you might need to scroll down with your mouse or arrow keys in order to proceed to the next screen. Note the following definitions: *Cultural conflict is a term used to describe conflict that occurs because of differences in cultural beliefs and values. *Cultural representatives are people who identify with the same culture and share the same beliefs and customs. *Persistence is the quality of a person that allows them to attempt or continue a difficult task despite opposition and/or resistance.

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Graduate students who experience cultural conflict must adjust to the dominant culture on campus, or have good connections at their university with cultural representatives to be persistent.	☐	☐	☐	☐	☐
The extent that individuals appreciate a graduate student's culture of origin can reduce the amount of cultural conflict experienced by the student, which can increase the student's persistence.	☐	☐	☐	☐	☐
The quality and quantity of a graduate student's connections with various cultural representatives on their own campuses is positively associated with their likelihood of persistence.	☐	☐	☐	☐	☐
Graduate students are more likely to persist if cultural representatives emphasize educational achievement, educational attainment, value, and cultural heritage.	☐	☐	☐	☐	☐

Q32 Section Three: This final section asks you to respond to a series of demographic questions. The answers to these questions will be used to examine similarities and differences in graduate school experience by age, gender, and marital status of participants. Click on the red box with the white arrows toward the bottom right of the screen to continue.

Q33 What is your present citizenship status?

- ☐ U.S. Citizen
- ☐ Naturalized U.S. Citizen
- ☐ U.S. Permanent Resident (green card holder)
- ☐ Dual Citizen-U.S. Permanent resident (green card holder) and citizen of another country
- ☐ Citizen of another country, residing in the U.S. with a student visa or other nonresident visa

Q34 What is your current age?

- ☐ 18-21 years old
- ☐ 22-24 years old
- ☐ 25-30 years old
- ☐ 31-35 years old
- ☐ 36-40 years old
- ☐ 41-50 years old
- ☐ 51-60 years old
- ☐ 60 or more years old

Q35 What is your gender?

- ☐ Male
- ☐ Female
- ☐ other

Q36 What is your marital status?

- ☐ Single, never married
- ☐ Married/ domestic partnership
- ☐ Widowed
- ☐ Divorced
- ☐ Separated

Q37 How many dependents do you have?

- ☐ None
- ☐ One
- ☐ Two
- ☐ Three
- ☐ Four
- ☐ Five
- ☐ More than five

Thank you for participating in the survey. Your answers will provide valuable information that will be used to inform national discussion about STEM education. In the space below, please provide any insights, questions, or comments about the survey that you feel are important.

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