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**Understanding Chinese International Students' Engagement and
Belongingness in U.S. Universities**

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of
Philosophy at Virginia Commonwealth University.

by

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Virginia Commonwealth University
Richmond, Virginia
August 2022

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Dedication

to

my dearest father Mr. Zhuoyun Jiang and mother Mrs. Meiqin Sun

in recognition of your unconditionally love and support

my grandparents Mr. Sannan Sun, Mrs. Xiujuan Sun, Mr. Guannan Jiang and Mrs. Ming Chen

for the gifting me with education and a good heart

and

my little sister Wenqian Jiang

may happiness never leave your side

谨此献给

我最亲爱的爸爸妈妈蒋卓云先生与孙美琴女士

是你们无私的爱支持了我

我的祖父母蒋冠南先生与陈明女士

外祖父母孙三南先生与孙秀娟女士

谢谢你们启蒙了我的教育以及正直善良的心

还有

我的妹妹 蒋文倩

愿你幸福永远

Acknowledgment

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Abstract

Understanding Chinese International Students' Engagement and Belongingness in U.S. Universities

by Yingying Jiang

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of
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Virginia Commonwealth University, 2022

Director: Dr. Lisa Abrams
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Little research has been conducted on Chinese international students' engagement and belongingness in the U.S. universities. This study was developed conceptually and theoretically based on the Astin's (1984) Student Involvement Theory, Strayhorn's (2018) College Student Belongingness Model and Ecological System Theory (Bronfenbrenner, 1994). This study used a non-experimental quantitative survey research design, and adapted survey items from past literature to target Chinese international students' experiences. Prior to the survey administration, pretesting including expert reviews and a think-aloud were carried out to validate the survey. A total of 76 Chinese students from various universities participated in the survey data collection. The quantitative analytical processes included Confirmatory Factor Analysis (CFA) to ensure construct validity; measurement invariance testing between groups and Structural Equation Modeling (SEM) included four major factors/predictors (English proficiency, years in the U.S., International Student and Scholar office support and racism) that influence Chinese international students' engagement and belongingness. The findings indicated belongingness positively predicted Chinese international students' engagement. English language proficiency positively predicted belongingness while racism negatively impacted belongingness after controlling the

other predictors in the model. And surprisingly, racism had a direct positive relationship with engagement after controlling for other predictors in the model. To limit concerns around sample size and provide further answers to research purpose, a focus-group interview was conducted with six Chinese international students in one university. Implications were presented within the Ecological System Theory, highlighting the importance of developing evaluation processes of current supporting programs and procedures targeting international students, and raising cultural awareness among faculty and staff. Limitations for this study and recommendations for future research were also discussed.

Keywords: student engagement, belongingness, Chinese international students, English language proficiency, International Student and Scholar office, racism, Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM), focus-group interview

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Chapter I: Introduction

Background

In recent years, higher education in the United States has become more internationalized. In the 2019-20 academic year, 1,075,496 international students which accounts for 5.5% of the total enrollment, were enrolled in academic programs in the U.S. (Institute of International Education (IIE), 2020), compared with 582,984 (3.4%) in 2007. Obst and Banks (2015) suggested that "we are in the midst of a dynamic time for international academic partnerships" (p. 25). Increasing partnerships between American universities and universities worldwide encourage student exchange to share best practices, conduct joint research, and prepare global citizens. As a result, engaging and promoting international students' success by creating support systems that specifically target their needs has become an essential aim for American universities. Through their experience and success in the U.S., international students can help to create global understanding and support positive relations between the U.S. and their home countries (Nikias, 2008).

The growth in international enrollment over the last decade is largely attributed to Chinese international student enrollment. According to the 2020 Open Doors Report on International Educational Exchange, for the tenth year, China is the largest source of international students in the United States, with 372,532 students (34.6% of all international students) enrolled in undergraduate, graduate, non-degree, and OPT (Optional Practical Training) programs. Even in 2019-20, when the overall international enrollment dropped by 1.8% because of the pandemic, Chinese international students' enrollment in the U.S. increased by 0.8% compared to the previous academic year (IIE, 2021).

However, even though many Chinese international students live and study in the U.S., very little research has been conducted on their college experiences. In particular, there is a limited amount of research exploring how Chinese international students are engaging with their college or university environments or if they perceive a sense of belonging in their school setting.

Research indicates that some institutions approach supporting student success by improving retention rates and focusing on students' academic achievement; others emphasize enriching students' overall experiences to increase their satisfaction (Martirosyan et al., 2019; Van Horne et al., 2018). Student engagement plays a significant role in both academic achievement and overall satisfaction. Extensive studies have demonstrated the positive outcomes of student engagement on students' wellbeing. These benefits include enhanced college experience (Seidman and Brown, 2006); academic success (Lee et al., 2018); and interpersonal skills (Rubin et al., 2002; leadership and problem-solving skills (Litzenberg and Dunner, 1996). Other research conducted on student engagement showed an increased sense of belonging for students when they were more engaged (Strayhorn, 2008a).

Sense of belonging, or belongingness, is recognized as a fundamental human psychological need and has been studied extensively in college settings as a long-term predictor of student academic achievement, retention, and overall well-being (Hoffman et al., 2002; Strayhorn, 2008a, 2008b, 2018; Van Horne et al., 2018). Strayhorn (2018) described the relationship between belongingness and engagement as a positive feedback loop. It means the likelihood of student engagement positively "predicts" students' sense of belonging and also works the other way around. It also means the absence of a sense of belonging may negatively impact students' engagement, and students who engage less in activities also feel less

belonging or welcomed. Indeed, fostering international student engagement and belongingness may heighten the benefits for Chinese international students facing new/foreign environments. Understanding Chinese international students' experiences will inform institutional strategies to cultivate positive and fruitful experiences to promote engagement and belongingness.

The global COVID-19 pandemic that started in March 2020, has been especially difficult for Chinese international students. Not only they had to face double-bind situations when they received conflicted information. For example, students received conflicting messages from families and Chinese authorities to wear protective masks yet at the early stage of COVID-19 in the U.S., masks were not yet recommended by government and experts. This group of students also suffered from increased discrimination and racism against Asian appearance/culture in the U.S. (Gao & Sai, 2020, Ma & Miller, 2020; Litam, 2020; Schild et al., 2020; Ziems, 2020). Many actions continued and progressed into violence, especially when President Trump called out the COVID-19 as the "Chinese virus," "Kung flu" and "China Plague" with racism.

According to a 2021 report from the Pew Research Center, Americans generally hold positive and welcoming attitudes towards international students, unfortunately, the opinions on Chinese international students were mixed. The survey results showed that 55% of general Americans supported restrictions on Chinese international students, with 20% of these participants feeling *strongly* about the idea (The Pew, 2021). As Wang (2020, p.2) commented, "this [Chinese] group of international students is the beneficiary of globalization and international education exchange yet witnessing the trend of anti-globalization and nationalism". The current social and political context in the United States provides a unique

opportunity to understand Chinese students' college-going experiences in a time of global crisis with heightened attention on the Chinese community.

Statement of Problem

Little research on student engagement among international students and specifically Chinese student populations has been conducted. Most research has examined the relationship between domestic students' engagement and their academic and social outcomes (e.g., Chickering & Gamson, 1987; Ewell & Jones, 1996; Pascarella & Terenzini, 2005). Chinese international students' unique needs, such as language skills, unfamiliarity with educational systems, social isolation, cultural rejections, and discrimination, can significantly challenge their engagement and make their post-secondary education experience very different from their domestic peers. According to the literature, most research has addressed international student engagement in educational practices like academic achievement. Indeed, international student engagement research has mostly focused on academic engagement; therefore, we lack an understanding of how social aspects of university life, such as participation in extracurricular programs influences engagement and belonging.

In addition, existing quantitative research about international student engagement has typically been based on the use of large-scale survey measures and resulting data, such as the NSSE (National Survey of Student Engagement) and the SERU (Student Experience in Research Universities) to study international student engagement (Van Horne et al., 2018; Williams 2014; Zhao et al., 2005). Using existing surveys and data can be very beneficial and allow for useful comparisons among student groups and across institutions. For example, with a tremendous amount of data gathered from 317 American universities by the Indiana University Center for Survey Research, which administers NSSE, Zhao et al. (2005) were able

to compare engagement between domestic students and international students, between international students with different ethnic backgrounds, and between international students in different institutions. Additional benefits of using established survey and data include existing reliability and validity evidence, time saved related to developing, piloting, and administering new scales. However, there are also gaps in using these instruments with Chinese international students. For example, the NSSE does not include items that address international traits or distinguished international students with origin (home countries).

Little research has been conducted on Chinese international students' belongingness or the connections they feel towards the institution and peers. The majority of literature centers on psychological challenges international students experience when adapting to new living and learning environments, for example, transitioning, acculturation, and discrimination (Lee & Rice, 2007). The use of Strayhorn's depiction of positive feedback loop between student engagement and belongingness can inform existing research on international student engagement and belongingness.

In addition, until 2020, racism has not been investigated in research regarding Chinese international students. During the pandemic, many researchers recognized the increasing discrimination and Sinophobia against the Asian/Chinese community and conducted urgent research to develop awareness. However, most of the work used online platforms as data sources and did not focus on Chinese international students' experience (Duong et al., 2020; Depoux et al., 2020; Schild et al., 2020; Ziem et al., 2020).

Purpose of Study

The primary purpose of this quantitative investigation was to explore student engagement and belongingness, specifically with Chinese international students in the U.S.

Based on the researcher's understanding of the constructs and literature on the international student experience, new items were generated based on existing measures. This study also investigated measurement invariance according to student characteristics that related to engagement and belongingness in previous literature, for example, gender, extraversion, degree and major (STEM vs. Non-STEM) (Erichsen & Bolliger, 2011; Malone et al., 2012; Wang & BrckaLorenz, 2018; Williams, 2014). In addition, this study intended to develop a comprehensive model on Chinese international student engagement and belongingness with four factors: racism, instructional support (with a focus on International Student Office (ISS)), time stayed in the U.S. and English proficiency.

The results of this study have implications for colleges and university programs designed to support international, specifically Chinese students. Universities had previous existing versions of implemented protocols on supporting international student engagement (e.g., McFarlane, 2015; Mata, 2017). However, Özturgut and Murphy (2009) identified a research and practice gap that universities were not using recent research to inform programs designed to support international students. Because these initiatives are less research-evidence based, it is uncertain that the current systems and steps can effectively engage international students. Another purpose of the study was to offer universities and practitioners insights to facilitate Chinese international students related to their engagement and belongingness experience.

Research Questions

The aim of this study was to examine Chinese international students' experience with engagement and sense of belonging to their host universities in the U.S in an effort to improve university support and programs. Both Astin's Theory of Student Involvement (Astin, 1984),

Strayhorn's Model of College Students' Belongingness (Strayhorn, 2018), and Bronfenbrenner's Ecological Systems Theory (Bronfenbrenner, 1994) provided the theoretical foundation of the study. Thus, this study focused on individual time in the U.S.; institutional support in a student's immediate environment (microsystem); language and racism as larger environmental factors (macrosystem). The following research questions guided the study design:

RQ 1.1: Are there measurement invariances in engagement based on demographic and personal characteristics such as gender, extraversion, degree and major (STEM vs. Non-STEM) of Chinese international students?

RQ 1.2: Are there measurement invariances in belongingness based on demographic and personal characteristics such as gender, extraversion, degree and major (STEM vs. Non-STEM) of Chinese international students?

RQ 2: What is the relationship between engagement and belongingness with Chinese international students after controlling for English proficiency, time in the U.S., institutional support and perceived racism?

RQ 3: What are the associations between English proficiency, time in the U.S., institutional support, racism, and engagement?

RQ 4: What are the associations between English proficiency, time in the U.S., institutional support, racism, and belongingness?

Methodology

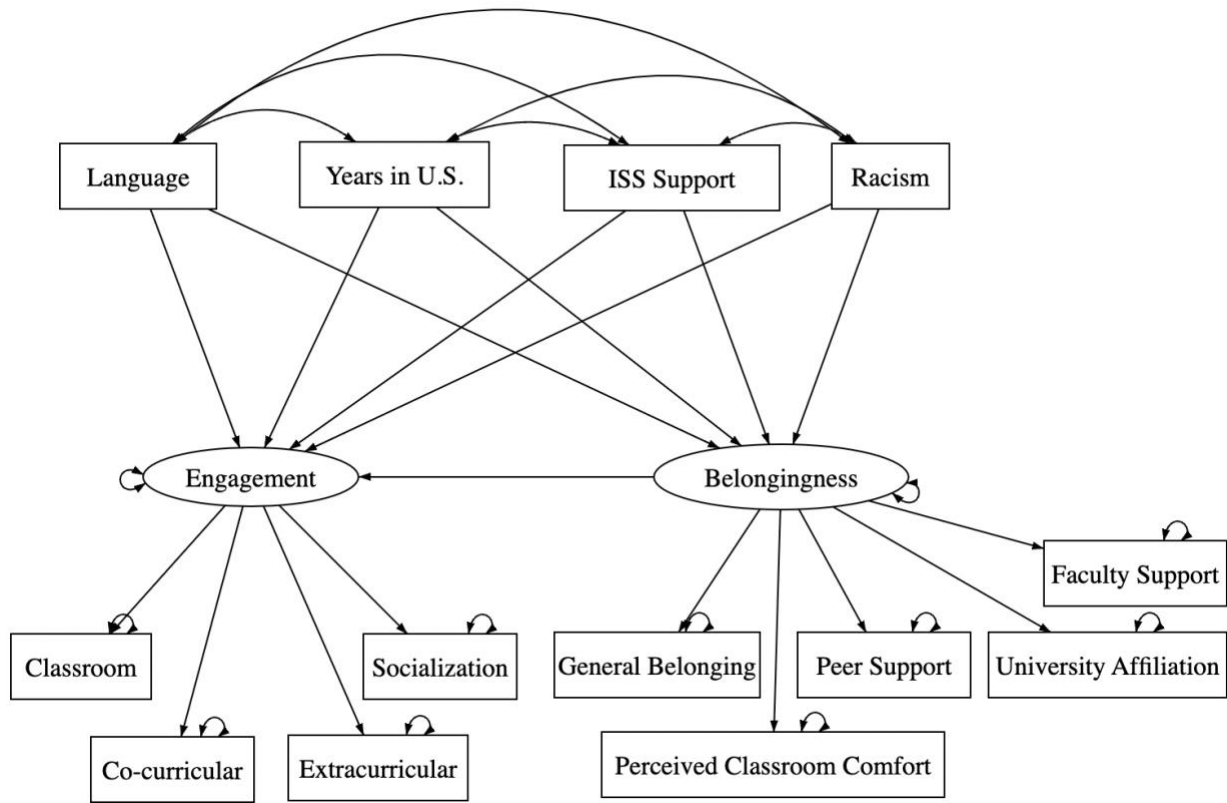
This study used a non-experimental quantitative survey research design. A survey adapted to measure Chinese international student engagement and belongingness was administered to Chinese international students in different U.S. universities. The survey

consisted of a total of 84 items and included items based on established scales, including the NSSE, SERU, General Belonging Scale (GBS), Hoffman et al. (2002) 's belongingness scales, Mini International Personality Item Pool (Mini IPIP) (Donnellan et al., 2006), Online Victimization Scale for Adolescents (Tynes et al., 2010), Racial and Ethnic Microaggressions Scale (Nadal, 2011) and Asian American Racism-Related Stress Inventory (Miller et al., 2012). Other items were developed based on the literature and experience of international students, including the researcher. Pretesting was conducted prior to the survey administration, which included three expert reviews and a round of think-loud that intended at survey administration platform and misleading questions. The analysis plan used Confirmatory Factor Analysis (CFA) and structural equation modeling (SEM) to study the multiple relationships in the proposed model (See Figure 1). Fit measures were analyzed.

A follow-up focus-group interview was conducted to provide further explanation to research questions, the construct structure, and the quantitative results. The interview protocol was developed based on the same sets of research questions.

Figure 1

Proposed SEM Model for Main Study Variables



Significance of Study

This study contributes to the existing knowledge related to student engagement and belongingness in four significant ways. First of all, the study contributes to the field empirically by addressing the existing research gap regarding international student's experience and increased understanding of Chinese international students' experiences specifically.

Secondly, it offers a theoretical contribution to the literature by combining Astin's Theory of Student Involvement (Astin, 1984), Strayhorn's Model of College Students' Belongingness (Strayhorn, 2018), and Bronfenbrenner's Ecological Systems Theory (Bronfenbrenner, 1994) and adapting this framework to Chinese international students. Thirdly, it provides a measurement contribution by administering an instrument with valid and reliable scores for Chinese international students, and it may be adapted to other groups of international students.

Lastly, this study uses SEM to examine direct and indirect relationships proposed in the study

and the predictive model that not only will contribute to the existing literature but may identify subsequent questions to guide future research.

The study findings also provide important insights to university administrators and faculty to support Chinese international students and international students in general, especially in times of global crisis such as the current pandemic. The methodology used provides a way to evaluate universities' current supporting systems and build a more culturally and linguistically friendly supportive network with larger institutional communities.

Definition of Terms

International Students at U.S. Universities

For this study, international students were defined as individuals who were born outside of the United States and came to the U.S. to pursue higher education. These may include holders of F (student) visas, H (temporary worker/trainee) visas, J (temporary educational exchange-visitor) visas, and M (vocational training) visas. Immigrants, refugees and those who participate in short-term educational programs (e.g., language, volunteer programs) were excluded from this study.

Student Engagement

NSSE (2020) defines student engagement as having two features. The first is the amount of time and effort students invest into academic and other educational-related activities. The second is how institutions support students by having learning opportunities and resources available.

Belongingness

Strayhorn (2018) 's working definition:

"In terms of college, sense of belonging refers to students' perceived social support on campus, a feeling or sensation of connectedness, and the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the campus community or others on campus such as faculty, staff, and peers." (p.4)

Racism

Racism is defined as,

“A form of prejudice that assumes that the members of racial categories have distinctive characteristics and that these differences result in some racial groups being inferior to others. Racism generally includes negative emotional reactions to members of the group, acceptance of negative stereotypes, and racial discrimination against individuals; in some cases, it leads to violence” (American Psychology Association, 2020).

Chapter II: Review of Literature

Overview

The current study aims to understand Chinese international students' engagement and belongingness in U.S. universities. A review of the literature was conducted to understand current research on belonging and engagement. This Chapter presents extended definitions of student engagement and belongingness to help operationalize these constructs. A review of methodologies and existing measures commonly used by researchers studying international students' engagement and belongingness is included, as well as a brief discussion of the methodological limitations. Existing literature also identifies unique factors associated with international students that influence these constructs, and they will be discussed to provide more accurate understandings of potential relationships. In addition, the theoretical framework that guides this study is discussed in detail.

Method of Review

To identify literature on student engagement, the researcher conducted an electronic search in February 2020 using the PsycINFO and ERIC (Educational Resources Information Center) databases. Broad terms for international students' engagement, "foreign students", "engagement" and "postsecondary education" were included in the search to capture as many studies as possible. The review focused on studies that: 1) were published in a peer-reviewed journal from 1999 to 2020; 2) included study participants who were international students at colleges or universities in the United States; and 3) included predictors of engagement. The rationale for including journal articles after 1999 is due to the creation of NSSE (National Survey of Student Engagement) that same year. Studies were excluded if: 1) international students were enrolled in short-term practicum/learning programs (usually during summer); or

2) the studies investigated engagement in distance learning or online education environment (e-learning). This search produced a total of 16 primary empirical studies relating to international student engagement.

In August 2020, the researcher conducted another literature review with a colleague regarding student extracurricular activities engagement and belongingness to develop a new scale for administration purposes. Although the process was not documented, the review focused on construct definitions, operationalizing extracurricular activities, engagement and belongingness, and previously used scales in literature.

At the end of 2020, the researcher conducted a third search combining international student engagement, belongingness, and racism towards Chinese international students. The primary database included Google Scholar and Eric. Initial search terms included “international student engagement”, “international student belongingness” and “Chinese international student experience”, “Chinese international student experience with ‘Racism’ and ‘COVID-19’”. These terms were entered in the search separately and in combination. Then “Chinese international student engagement” and “Chinese international student belongingness” were added to ensure relevant literature was included in this current study’s literature base. Inclusion was determined primarily based on the year of publication, relevancy to this study, and psychometric properties discussion when a quantitative survey measure was used.

Theoretical framework

In this section, the three major theories that guided the conceptualization and design of the current study are discussed: Astin’s Theory of Student Involvement (Astin, 1984), Strayhorn’s Model of College Students’ Belongingness (Strayhorn, 2018), and Bronfenbrenner’s Ecological Systems Theory (Bronfenbrenner, 1994).

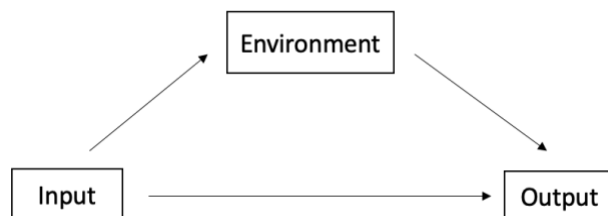
Astin's Theory of Student Involvement

Three key educational assumptions Astin's Theory of Student Involvement proposed were: 1) involvement refers to physical and psychological energy invested in objects; 2) involvement should be measured quantitatively and qualitatively; and 3) the effectiveness of educational policies and practices determine the capacity of students' involvement in such practices (Astin, 1984). The Theory of Student Involvement offers a fundamental conceptualization of student involvement/engagement for many empirical studies.

Astin emphasized that "theory of student involvement encourages educators to focus less on what they do and more on what the student does: how motivated the student is and how much time and energy the student devotes to the learning process" (Astin, 1984, p. 522). This placed the student at the center of investigation and highlighted the importance of factors that enhance engagement. Astin also presented the Input, Environment, Output framework (IEO) framework along with the development of the Theory of Student Involvement (See Figure 2). He described Input as various practices and programs offered by universities and Output as student achievement. Moreover, the Environment as the mediating mechanism explained how these educational policies and programs were influencing student achievement. The IEO was later interpreted differently by Astin and adapted by other researchers, which will not be discussed in this review.

Figure 2

The IEO framework



Strayhorn's Discussion between Engagement and Belongingness

Strayhorn's Model of College Students' Belongingness describes belongingness as a basic human need and motivation that influences many major student outcomes, such as achievement, engagement, and well-being (Strayhorn, 2018). He argued that a sense of belonging should be considered within a specific context, time, and population, which supported this study's intention to study Chinese international students during a global pandemic.

Strayhorn's discussion of student engagement and belongingness provided the basic theoretical framework for the current study. Based on Astin's Theory of Student Involvement and four studies Strayhorn conducted, Strayhorn (2018) described the relationship between belongingness and engagement as a positive feedback loop. The relationship suggests that student engagement positively "predicts" students' sense of belonging, and also works the other way around, where belonging can "predict" engagement. It suggests that the absence of a sense of belonging may negatively impact students' engagement, and students who engage less in activities also feel less belonging or welcomed.

In study one, Strayhorn (2008a) analyzed survey data from the College Students Experiences Questionnaire (CSEQ), which contained 191 items of quality and quantity measures of student engagement and was administered to more than 8,000 students. The results indicated that students who were more engaged with student organizations, clubs, sports-related activities, and faculty members outside of the classroom had a stronger sense of belonging than their peers who were less engaged. The data from CSEQ confirmed Strayhorn's hypothesis that student engagement may have a direct and positive influence on belongingness. In a second study, Strayhorn (2009) developed a scale that focused on students' pre-collegiate

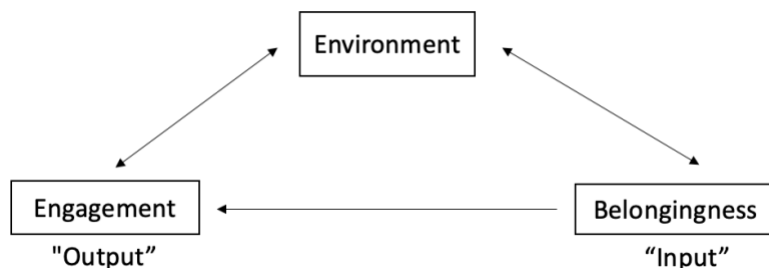
personal histories, engagement in college, and their evaluations of college and administered the survey to over 700 college students. The findings of this study further supported the positive relationship between engagement and belongingness.

Based on these quantitative findings, Strayhorn later conducted two in-depth qualitative studies to deepen the understanding of the relationship between college students' engagement experience and belongingness. One study was conducted using a set of semi-structured interviews over a 12-month period in multiple campuses all over the U.S. (Strayhorn, 2011). A subsequent study used "time diaries" that were suggested by Astin to document time students devoted to various activities (Strayhorn, in press). They recruited 60 college students from a predominantly White institution and 20 students from a predominantly Black institution. These two studies revealed that by investing time and energy in college activities, students satisfied their goals to belong (need to belong) (Strayhorn, 2018).

In Astin's IEO framework, Output was initially defined as student outcomes, such as student achievement and retention. With Strayhorn's previous studies, student engagement and belongingness were positively related. In this current study, engagement was considered as the Output and belongingness was considered as Input to explore the relationship with Chinese international students (See Figure 3).

Figure 3

Developing Theoretical Framework Based on Astin (1984) and Strayhorn (2019)

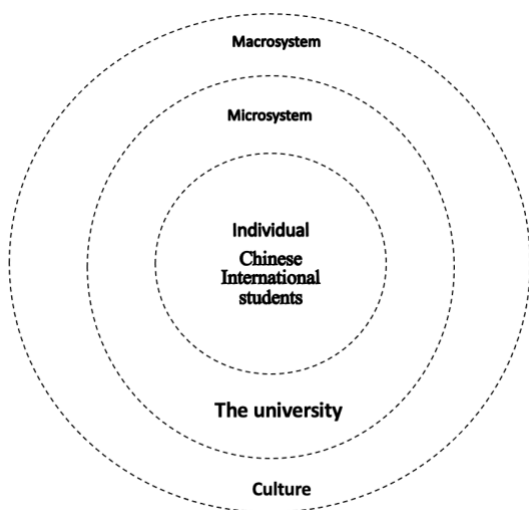


Bronfenbrenner’s Ecological Systems Theory

Bronfenbrenner’s Ecological Systems Theory was introduced to operationalize “Environment”- factors influencing Chinese international students' experience with engagement and belongingness. Bronfenbrenner’s Ecological Systems theory was first developed in developmental psychology. One of the two core propositions Bronfenbrenner explained was that “human development takes place through processes of progressively more complex reciprocal interaction” (Bronfenbrenner, 1994, p. 38). His theory also defines the complexity of different levels of the environment that could affect the person’s development. In this current study, the researcher decided to investigate factors that influence international students’ engagement and belongingness within Bronfenbrenner’s Ecological Systems Theory and categorize factors in these layers. However, due to the complexity between systems, this study will only focus on the individual level, Microsystem and Macrosystem (See Figure 4).

Figure 4

Adapted Ecological System Theory



This system provides a nested structure to organize these factors; dotted lines in Figure 4 speak to the interaction between systems, and the systems are briefly described below.

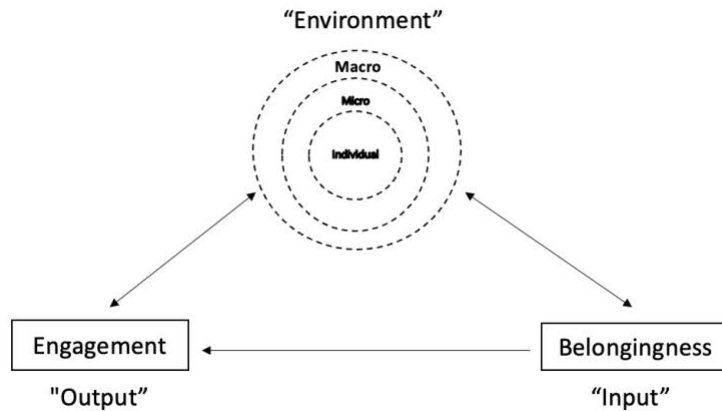
Bronfenbrenner described a microsystem as “the immediate environment [with features] that invite, permit, or inhibit engagement in sustained, progressively more complex interaction with, and activity in” (1994, p. 39). International students’ immediate environment is the university. Most of their experience happens in the university and is shaped by university resources. For example, as family members’ involvement begins to fade, this is the time to seek new relationships with students, faculty and staff. Factors in the Macrosystem may include Chinese culture, the relationship between China and the United States, and COVID-19.

Placing factors in the system helps organize these factors and offer practical implications to universities. Factors in the Microsystem fall directly under the university’s supervision, which provide more practical implications of this study, such as evaluating current programs, and increasing faculty sensitivity to international student needs. Factors at the individual level and in Macrosystem might have less practical implication to universities but are also essential to reveal Chinese international students’ experience and the relationship between students’ engagement and belongingness.

This current study's fundamental theoretical framework is developed by combining and adapting these three major theories together (See Figure 5). And by applying them to Chinese international students, this study provides an extension and critiques of theories.

Figure 5

Current Study’s Theoretical Framework



Student Engagement

In this section, a comprehensive review of student engagement will be presented to justify the need to focus on each subcategory of engagement and literature review findings associated with each subcategory of international students' engagement.

Overall Definition of Student Engagement

In 1999, the National Survey of Student Engagement (NSSE) was developed to empirically measure student engagement related to educational practices and their college experience. Most recently, more than 480,000 students at 601 institutions participated in NSSE 2020 (NSSE, 2020). The formation of NSSE encourages administrations to share information about students' engagement, which helps researchers investigate engagement and its relationship with learning outcomes. Astin's student developmental theory focused on college student involvement has significantly contributed to the NSSE's conceptualization of student engagement (NSSE, 2013). NSSE (2020) defines student engagement as having two features. The first feature is the amount of time and effort students invest into academic and other educational-related activities, which are based on Astin's quantitative feature of time, and quality feature of effort. The second is how institutions support students by having learning

opportunities and resources available, which Astin described as the effectiveness of educational policy and the “E” (Environment) in the IEO framework.

Similarly, P. Trowler and V. Trowler (2011) suggested that student engagement is concerned with the interaction between time, effort, and relevant resources students and institutions invested in enhancing student success and institutions’ reputation. Based on these definitions, when measuring student engagement, it is important to account for the time students put into various activities and the willingness to invest in the effort (e.g., show persistence in the face of a pandemic), as well as the availability and students’ awareness of university resources.

What are these activities? The first feature of engagement NSSE defined is curricular and co-curricular activities engagement. The second features extracurricular engagement. One of the limitations of NSSE’s definition is that it doesn’t account for the socializing aspect of the engagement. Unlike domestic students who have established social relationships, most international students come to the U.S. without any social ties (Cao et al., 2017). Thus, supporting the formation of a social network is an essential goal for U.S. universities. To operationalize international student engagement, the researcher provided subcategories of student engagement (See Table 1) based on the NSSE’s definition of student engagement.

Table 1

Engagement Categories and Examples

Construct	Subcategories	Examples
Academic Engagement	Classroom Engagement	Interaction with instructors Engagement with materials
	Co-curricular Activities Engagement	Internship opportunities Tutoring
Social Engagement	Extracurricular Activities Engagement	Student Organizations Cultural Events
	Socializing	Friends Party

Academic Engagement

In this study, academic engagement refers to both engagement in classroom activities with faculty, peers and materials, and co-curricular activities. Bartkus et al. (2012) proposed the definition as “co-curricular activity is one that requires a student’s participation outside of normal classroom time as a condition for meeting a curricular requirement (p.699).” Co-curricular activity is complementary to the curriculum and also is aligned with the academic outcomes. Some examples are internships, research/projects team meetings, and lab experiences.

Previous studies that used nationally established surveys like NSSE obtained a large amount of data and provided a comprehensive picture of international student engagement with educational activities. For example, Zhao et al. (2005) included 71,260 college students in their study, including 2,780 international students from 317 American universities. They compared results between domestic and international students and investigated whether students with different ethnic backgrounds reported different experiences. They found that international student engagement and educational outcomes differed by race and ethnicity. The findings

showed Asian students were less engaged in active and collaborative learning and diversity-related activities compared to White and Black international students.

Zhao et al. (2005) also concluded that first-year international students had greater challenges with coursework and interacting with faculty than their American peers and reported more significant gains in personal and social development and educational outcomes. Their study revealed that international students in their senior year had adapted to the university and community environment and their reported levels of student engagement did not differ appreciatively from American seniors. Furthermore, they found that international student density is a factor that may influence how international students spend their time on campus and may influence their desired outcomes (Zhao et al., 2005). The availability of existing measures like the NSSE have encouraged and promoted research work with international students' academic engagement in the U.S.

Similar to Zhao and colleagues' (2005) findings on faculty-student interaction, Van Horne et al. (2018), using the SERU survey, indicated that international students perceived a similar level of interaction with faculty compared to American peers. Van Horn et al. (2018) found they were less likely to engage in higher-order academic tasks and less satisfied with their educational experience.

Studies that investigated faculty perspectives found faculty in STEM fields encouraged international students to collaborate with their peers more than faculty in non-STEM fields (Wang and BrckaLorenz, 2018). Asian and Native Hawaiian or other Pacific Islander faculty and Black or African American faculty participated in more faculty-student interactions with international students. These faculty also encouraged more collaborative learning activities for international students compared to their White colleagues. In addition, Hispanic or Latino

faculty and faculty who prefer not to respond about their racial/ethnic identification interacted more with international students outside of courses (Wang and BrckaLorenz, 2018).

Classroom engagement consists of students' engagement with materials and peers. Previous studies have examined international students' classroom engagement within their English language classes and first-year English composition courses. Phung (2017) targeted learning material and found students engaged more when performing tasks of their preference. They asked more questions and made more attempts to confirm and clarify meaning and language. Matheson and Sutcliffe (2018) targeted creating a trustworthy environment. They found by creating a sense of belonging and group cohesion, students could integrate into active educational practices.

Social Engagement

Social engagement refers to extracurricular activities' engagement supported by universities and general socializing initiated by the local community and students. Bartkus et al. (2012) did an extensive literature review on extracurricular activities and incorporated part of Elizabeth's (2020) definition of extracurricular activities. They proposed,

Extracurricular activities are defined as academic or non-academic activities that are conducted under the auspices of the school but occur outside of normal classroom time and are not part of the curriculum. Additionally, extracurricular activities do not involve a grade or academic credit and participation is optional on the part of the student (p.697 in Bartkus et al., 2012).

To better understand and operationalize extracurricular activities for the current study, the researcher included a categorical approach introduced by Rubin et al. (2002) and enriched by Eccles et al. (2003). The original categories consist of pro-social activities, performance

activities, sports, school involvement and academic activities. However, to capture Chinese international students' experience more accurately, performance activities are eliminated because it is less likely for international students to join university bands and perform as extracurricular. Examples are provided in Table 2.

Table 2

Extracurricular Activities in Categories

Categories	Examples
Pro-social activities	Cultural events Religious activities
Sports	Trips to attractions Exercise
School Involvement	Chinese International Student Association Student clubs
Academic activities	Mentoring Program English language/ foreign language program

International students' ability to socialize with friends and other community members, to communicate within a culture and across different cultures is essential and determines their positive experience in the U.S. Previous research found international students held moderately negative perceptions towards their social integration and they were less likely to believe that there was a positive climate for diversity and respect on university campuses (Van Horne et al., 2018). These findings were also supported by Baxter (2019) and Karuppan and Barari (2011), who found constrained relationships and perceived discrimination in their international students' experience.

In terms of forming social networks, McFaul (2016) constructed a social diagram that visualized how international students tended to have social networks made up of people from

similar cultural backgrounds or other international students. This research also showed that host-international friendships were formed in similar and limited ways, through class, work, residence and housing opportunities. This was also supported by T. Toyokawa and N. Toyokawa's study (2002) that found Japanese students' engagement in out-of-class activities could be meeting other Japanese students' needs and the fear of losing connection with the "Japanese group". These findings further demonstrate the influence of cultural factors on international students' social engagement; however, less evidence was found specifically targeting Chinese students.

Gaps in Current Engagement Literature

Based on the review of international student engagement, several gaps were identified in current literature and available instrumentation. First, international student engagement research mostly focused on academic engagement (Zhao et al., 2005). Researchers have shown that international student academic engagement was comparable with domestic students. Although social experience plays an essential role in college students' development, research has not yet emphasized enough international students' extracurricular and social engagement. Only four studies out of 16 studies that the researcher found related to international student engagement focused on or involved the social aspect of engagement (e.g., McFaul, 2016; T. Toyokawa & N. Toyokawa, 2002).

Second, the NSSE encouraged and promoted research work with international student engagement in the U.S. However, the fact that the NSSE was developed targeting a general student group created limitations when studying international students. Foot (2009) argued that NSSE is not a cross-cultural tool intended for international students, it is a western culturally based instrument that targets western campus climate and student behaviors. In addition, the

fact that many international students' experiences were not addressed in the survey created further gaps in understanding international students. For example, many U.S. universities implement initiatives and strategic plans through Global Education Offices (GEO)/ International Student Office (ISS) to enhance international students' engagement and help them to succeed. Students' interaction with GEO and ISS is essential to address when measuring student perceptions of engagement. Research on international engagement reveals distinct factors unique to international students, such as language barriers, unfamiliarity with educational systems, social isolation, questioning of a new identity or discrimination can significantly influence engagement (Korobova, 2012). These factors are not reflected in the items comprising the NSSE and will be discussed in the following section within the Ecology System Theory.

In addition, "international student" is a very general term, and does not recognize the background and cultural differences among international students. Treating international students as a single group is potentially problematic in research. For example, the English language has a strong influence on the international student experience in the U.S., many researchers and international students refer to it as a language barrier. However, India (202,014; 18.44%) and Canada (26,122; 2.38%) were the second and third of top five countries with the greatest number of international students in the U.S., and these international students would not experience the English language as a barrier (IIE, 2019).

In summary, the literature review offered a glance at previous research findings in international students' academic and social engagement, and provided guidelines to generate new measurements in this current study. An extended discussion of new items related to Chinese international student engagement will be discussed in Chapter three.

Belongingness

Strayhorn (2018) argued that there was a positive relationship between engagement and belongingness. In this section, the researcher provided a more detailed review of Strayhorn's model of college students' sense of belonging, critics, and a discussion of existing measures of belongingness are also included in this section.

Strayhorn's Model of Sense of Belonging

Belongingness or sense of belonging is generally referred to as the feeling of connectedness, and the experience of one is an important or integral part of the system/group (Rosenberg & McCullough, 1981). Extensive research has linked low-belonging or marginalization to depression, drop out and suicide (Hagerty, Williams, & Oe, 2002), and higher levels of belongingness to academic success and retention (Strayhorn, 2018). As a result, colleges and universities have focused on fostering belonging among students in an effort to improve academic outcomes and support well-being. This study uses Strayhorn's working definition of college students' sense of belonging and the associated core elements. According to Strayhorn (2018, p.29), there are seven core elements of belongingness.

- 1) It is a basic human need.
- 2) It is a fundamental motive, sufficient to drive human behavior (act), and acting may increase belongingness.
- 3) It must be satisfied continuously and changes as circumstances and conditions change.

The first two elements emerged from Maslow's (1954) model of basic human needs- the hieratical order described human need, from the human physiological need to social motives including belongingness, and at the top of the order- self-actualization. Strayhorn

(2018) argued that the belongingness needs to be satisfied before meaningful engagement can be experienced. The third element showed the importance of cultivating international students' belongingness in a foreign environment based on students' needs and context change.

The fourth element corresponded with his definition of belongingness, which emphasized mattering, connectedness and support from the university, faculty, staff, and peers. The fifth element explained Strayhorn's intention to connect belongingness to other variables and long-term outcome, which is student engagement in this study.

4) It is related to the feeling that one matters, is valued, or appreciated by others

5) It leads to positive outcomes and success such as achievement, engagement, and happiness

The last two core elements of belongingness brought out the importance of introducing belongingness to minority students. They are:

6) Sense of belonging takes on heightened importance in certain contexts, at certain times, or among certain populations.

7) It is influenced by one's identities.

Strayhorn conducted several studies on racial minority groups' belongingness at predominantly White institutions, including African American (2008b, 2008d) and Latino students (2008c) in different contexts, those in STEM majors, from a lower socioeconomic status and urban educational institutions. Across these studies, he found that it was more challenging for students in marginalized groups to feel like they belong, and they obtain a sense of belongingness in ways that differ from their white student peers. Other researchers have confirmed these findings. For example, Hurtado and Carter (1997) investigated how social support influenced Latino students' belongingness and found Latino students needed

more attention on transition and belonging. They found that engagement in religious activities and community organizations outside of the college increased Latino students' sense of belonging and perceived membership in the college environment, which also confirmed the positive relationship between student belongingness and social engagement.

International Student Belongingness

It is more challenging for Chinese international students to develop belongingness in the university than domestic students; however, it is essential to cultivate these students' belongingness in order for them to have a meaningful and successful experience in the U.S.

Belongingness focused on international students has only been introduced to the literature recently. For example, Van Horne et al. (2018) explored international students' social integration using quantitative principal components analysis (PCA) with the SERU survey. International students reported significantly lower belongingness and an even lower sense of respect received on campus compared to their domestic peers. In addition, their sense of campus diversity was also lower compared to domestic students, which was consistent with other researchers' findings regarding discrimination against international students. Poyrazli and Lopez (2007) indicated in their study that international students perceived a higher level of discrimination than domestic students and Mwangi (2016) found discrimination had a negative effect on international students' belongingness.

In addition, Van Horne et al. (2018) found that an increase in cumulative GPA was associated with a minor decrease in belongingness. They argued that this result highlighted the difficulty for a sense of belonging even for high achieving international students, and universities should not assume academic achievement counteracts a lack of belonging.

The research on Chinese international students' belongingness is very limited within the larger body of emerging literature on international students belonging. The majority of this specific line of inquiry centers on psychological challenges Chinese international students have adapting to the new living and learning environments, for example, transitioning, acculturation, and discrimination (Lee & Rice, 2007).

Cao et al. (2017) examined the development of social relationships to study Chinese international students' acculturation experience. Their results were similar to other researchers studying international students' social networks (e.g., McFaul, 2016); Chinese international students primarily chose to build co-national ties (make friends with people who have Chinese background), followed by interactions with domestic students and other international students. Cao et al. (2017) implied that English language proficiency played an essential role in this pattern of building social ties. The study also demonstrated that building the latter relationships with domestic students and other international students was the key to developing a positive attitude towards the new culture and a better integration in the new environment. Other studies found past adaptation experience, secure attachment, faculty and peer support as important factors influencing Chinese international students' acculturation experience (e.g., Cao et al., 2017; Wang & Mallinckrodt, 2006); however, these studies were not an investigation of belongingness.

Yao (2014) interviewed 21 first-year Chinese international students' belongingness in the residence halls and participants reported relatively low belongingness. Yao (2014) found language proficiency as a barrier to belongingness in residence halls; cultural differences led to decreased interaction with American roommates and peers; and surprisingly, tension with the

large number of Chinese international students on campus. Participants also described social isolation and the awareness as an outsider in Yao's (2014) study.

In summary, Chinese international students face many challenges to satisfy their need to belong. It is not surprising that international students, in general, suffer from a lower sense of belonging, as they are "foreigners" and their status is "temporary." Previous research and Strayhorn's model suggested that belongingness is important to college students and even more critical for marginalized student groups. However, international student belongingness has not received enough attention in the literature, especially among Chinese international students, and in the racialized climate of COVID-19.

Factors Influencing Chinese International Students' Engagement and Belongingness

To capture a more accurate picture of the Chinese international students' experience with engagement and belongingness in U.S. universities, factors that have been identified in previous studies influencing international students' engagement and belongingness are considered to include in this study.

Past studies identified homesickness, unfamiliarity with educational systems, socialization, unfamiliarity with educational systems, the maintenance of self-esteem, questioning of a new identity, adjustment to local food and climate, finances, stress, language problems and discrimination are some common challenges most international students encountered (e.g., Cho 2013; Gu et al., 2010; Van Horne et al., 2018; Walker, 1999; Zhao et al., 2005). Zhao et al. (2005) determined international student engagement and educational outcomes differed by race and ethnicity. Strayhorn (2019) emphasized the heightened importance of belongingness with a different population. However, this study targets a single

ethnic group; thus the engagement and belongingness between different ethnic groups were not explored or discussed in this study.

Many factors that influenced Chinese international student experience were dependent on their international background or the nature of being international students. Chen and Yang (2014) stated that being exposed to different cultural and different educational systems and expected to learn to manage conflicts and challenges, while some conflicts may be beyond modification and adjustment, could create stress and frustration. Researchers also pointed out three aspects that international students needed to adapt to the new culture and new education environment: social interaction, academic development, and language mastery (Chen and Yang, 2014).

The following section details the factors that have been noted by previous researchers in the field of international student engagement and belongingness, with the focus on English proficiency, time in the U.S., institutional support (primarily with ISS), and racism. These factors are considered within the Ecological System Theory, from individual-level factors to the Microsystem and those in the Macrosystem.

Factors at Individual Level

Time in the U.S.

Zhao et al. (2005) reported that first-year international students had higher academic challenges and student-faculty interactions than their American peers. Senior year international students tend to be more adapted and do not differ from American seniors in their student engagement patterns. Thus, it is essential to include “time/duration” when studying international students. The longer they stay in the U.S, the more comfortable they become with culture and language, their experience might change significantly. Similar findings appeared in

Erichsen and Bolliger's (2011) comparisons of graduate students and undergraduate students. Graduate students had lower levels of language difficulties and were more likely to interact with faculty outside of the classroom.

Adjustment. It is common that researchers included adjustment as a time-related factor in studies that focused on first-year international students (Singh, 2018; Yao, 2014). Research indicates that the longer international students have stayed in the U.S. and exposed to the environment, students are more likely to adjust to their new identity, the educational system and cope with homesickness.

New Identity Development. Cho (2013) interviewed three Korean students, and one theme participants revealed was their non-native speaker status had a negative influence on their teaching opportunities. The researcher found, although accepting new identities sometimes meant losing privilege and power, participants' negotiation of their identities was crucial to their engagement.

New Educational System. Matheson and Sutcliffe (2018) indicated that unfamiliarity with the educational system or inability to pick up new rules created classroom engagement problems.

Homesickness. Homesickness is a byproduct of cultural shock and an important indicator of adjustment. Poyrazli and Lopez (2007) found that international students experienced a higher level of homesick when they experience discrimination or having trouble with English language proficiency. Singh (2018) introduced homesickness in the model predicted belongingness and found a strong negative effect. Singh (2018) concluded that the effect of homesickness was generally negative; it influenced belongingness directly and indirectly through low adjustment and the feeling of loneliness.

Although T. Toyokawa and N. Toyokawa's study (2002) found Japanese students' psychological adjustment was not significantly related to their extracurricular activity engagement, this study explored Chinese international students' adjustment by accounting for the time spent in the U.S.

Gender

Perception of isolation is a key indicator for social engagement and belongingness. Erichsen and Bolliger (2011) found graduate students' gender varied their perceptions of isolation. They found that males felt significantly stronger about having a circle of friends they can rely on than females. Also, Williams (2014) found that female Black international students perceived higher belongingness than their male peers when controlled for other predictors.

Personality

Malone et al. (2012) found strong correlations between belongingness and Big Five personality traits of Neuroticism and Extraversion, which is interesting to explore with my project, as Extraversion is also a significant predictor of engagement (Toma, 2015).

Factors in the Microsystem - Institution

Faculty, Peers, Staff

Peers, the university's faculty and staff are central to any student experience in the university. Items that measure the interaction between them and the Chinese international students are included in the measuring engagement, and items that measure Chinese international students' perceived support from them are included in the belongingness scale. Some other factors related to faculty and peers that were explored in this study are introduced below.

Major Area of Study (STEM vs. Non-STEM). Wang and BrckaLorenz (2018) found faculty in STEM fields encouraged more collaboration between international students and their peers, and more collaborative learning activities, compared to faculty in non-STEM fields.

Social Connections. In terms of peer interaction, researchers have shown that interaction with students with different backgrounds may be more beneficial to develop a stronger sense of belonging. Strayhorn (2008b) indicated peer interaction produced higher belongingness, and belongingness was greater when students socialize with someone whose background was different from themselves. In addition, Cao et al. (2017) found Chinese international students primarily social with other Chinese international students (National ties). However, it was the host-national (with domestic students) and international ties (with international students from other backgrounds) that cultivated positive experiences with the host culture and social integration.

International Student Density

In addition to the research that has indicated a positive relationship between different forms of social ties with belongingness, Zhao et al. (2005) introduced international student density as a factor that might influence how international students spend time and desired outcomes. They found higher international student density had positive effects on diversity-related experiences. However, studies have shown that international students tended to own social networks with people from a similar cultural background (e.g., Cao et al., 2017; McFaul, 2016). Thus, the higher international student density in an institution may lead to less perceived social isolation, but also lower chances of interaction between different cultures and a lower sense of belonging.

Institutional Support

Many researchers have emphasized the importance of institutional support, services, and environment on international students' positive experience (e.g., Chen & Yang, 2014; Cho, 2013). To illustrate, in Cho's (2013) study, participants mentioned that institutional support had great influences on their academic participation; Chen and Yang (2014) indicated that universities should support international students in terms of social interaction, academic development and language mastery. Based on Martirosyan et al.'s (2019) analysis of supporting services in top 20 U.S. universities that have the greatest enrollment with international students in 2016, and Dearnorff et al.'s (2012), the researcher identified programs and supporting departments to focus on in this study (See Table 3). International Student and Scholar Offices (ISS) oversees all the support that international students receive and is the primary resource international students have.

Table 3

International Services and Support

Areas	Examples	Support Team
Language Proficiency	-Conversational Partners -Conversational hours -Writing Consultant	-ISS -Writing Center/Lab
Academic Support	-Orientation -Advising	-ISS -Academic Department
Social/Cultural Support	-Housing -Chinese Festivals -Global Affairs -Sightseeing Trips	-ISS
Finance and Work	-Job Search -Legal issues related to work -Tax	-ISS -Career Service

Factors in Macrosystem

The Macrosystem includes all patterns of influencing factors in other subsystems, like culture, and the COVID-19 pandemic. It is important to note language is placed in the macrosystem because of the role language plays in the representation of culture.

Language

Previous studies found language as a significant barrier to international student engagement and belongingness (e.g., Cao et al. 2017; Cho, 2013; Karuppan and Barari, 2011; Nieto and Zoller Booth, 2010; T. Toyokawa & N. Toyokawa, 2002; Yao, 2014); many researchers and international students refer to it as a language barrier. While this might not be true for students who came from Europe and other English-speaking regions, research about language is important to a large portion of the international student population whose first language is not English. Cho (2013) found oral English skill was the most significant factor influencing participants' educational participation. Cao et al. (2017) implied that English proficiency was a major influencer in developing Chinese international students' social ties.

Nieto and Zoller Booth (2010) examined the instructors' attitude towards international students in the classroom, and instructors agreed culture and language were the greatest challenges international students faced when it came to in-class interaction. Karuppan and Barari (2011) provided additional evidence in their study that English proficiency had a strong, positive impact on active and collaborative learning and interactions with students of different cultures. Indeed, better language skills were considered to be associated with better social interactions (T. Toyokawa & N. Toyokawa, 2002), and Cho (2013) found international students manifested social interaction as an attempt to improve English skills, like connecting to local churches.

The language also plays an interactive role with other factors that influence engagement. Matheson and Sutcliffe (2018) found individual academic identity was a significant obstacle to student engagement; they suggested that a cause could be that most international students had passive learning in the past. However, “active engagement requires confidence and picking up the new rules that translate such engagement into academic success” (Matheson & Sutcliffe, 2018, p. 607), so many issues were related to the language barrier and a lack of understanding of the educational system. Similarly, Karuppan and Barari (2011) determined that perceived discrimination negatively affected international student engagement, and English proficiency can act as a moderator to this negative relationship between perceived discrimination and student engagement.

Double-Bind Situation

According to Ma and Miller (2020), Chinese international students’ experiences are very stressful due to the conflicted information from Chinese and the U.S. government; from Chinese families and friends versus the lived experience in the U.S. In the earlier stage of the pandemic, when the Chinese government issued Wuhan lockdown as an emergency reaction to COVID-19, many western media accused the action as harsh, restricted, and even inhumane. Later, when the outbreak started in the U.S., Chinese international students were urged to stock up and wear masks by Chinese media, established protocols and Chinese families and friends; however, at the time, wearing a mask in the U.S. was not a preventive action, but the sign of infection. Ma and Miller (2020) also described the situation when Chinese international students were trying to go back home when China had stabilized the situation, but the authorities decreased the number of flights between the two countries. The situation later accumulated when Trump’s administration filed several cruel attacks on international students.

They announced on July 6th, 2020, international students were required to take courses in person, and they had to leave the U.S. if the university had gone entirely online.

The lists of double-bind situations could go on, and many of these required Chinese international students to differentiate conflict information, resolve the contradictions, and make decisions with consequences (Ma & Miller, 2020). In Ma and Miller's (2020) study, they revealed a significant difference in anxiety between those Chinese international students who did not experience a double-bind situation, those who experienced and could differentiate, and those who experienced but could not differentiate.

Racism

This group of students also suffered from increased discrimination and racism against Asian appearance/culture in the U.S. Many actions continued and progressed into violence, especially when President Trump called out the COVID-19 as the “Chinese virus,” “Kung flu,” and “China Plague” with racism.

Jordan (2008) explained why one might develop racism towards a specific ethnic group during the pandemic. He mentioned: “in times of crises, it is common for individuals to view one another as belonging to vague groups —victims/perpetrators, casualties/not-victims, injured/helpers, and so on” (p. 242). He further explained this creates a further division of people who deserve support versus other groups who do not. Those “others,” unfortunately, are Chinese during this COVID-19 global emergency.

Form of Racism before COVID-19. While Chinese international students might encounter physical violence due to racism, verbal assaults occur more often. Brown & Jones (2013) illustrated such abuse behavior included swearing, being told to go back to China, negative comments on government and country, and aggressive laughter. Other “racial

microaggressions” that may unintentionally pose racism to Chinese international students include avoiding sitting next to the students in lectures and avoiding group work with them. These behaviors may be subtle forms of racism but showed international students that they are less welcomed and belonged in the community.

Dovchin (2020) illustrated another form of racism- linguistic racism related to the academic environment. He explained linguistic racism through two main traits, “ethnic accent bullying” and “linguistic stereotyping”. Ethnic accent bullying refers to the discrimination against linguistically and ethnically different speakers’ English accents. Linguistic stereotyping refers to predefined, negative perceptions of speakers’ English proficiency regardless of their actual English proficiency level, but based on their nationality, race and ethnicity. These linguistic racism traits posed severe psychological damage to international students that might lead to social withdrawal, a sense of non-belonging, and fear of speaking English (Dovchin, 2020). This study also confirmed that racism towards international students originated from nationalism and national discrimination, which is different from traditional racism based on skin color (Lee, 2006).

Racism during COVID-19. Chinese international students continued to be vulnerable from the traditional form of racism; researchers revealed racism from the online platform has increased during the COVID-19 pandemic. For example, Schild et al. (2020) collected data from Twitter and 4chan’s Politically Incorrect board (/pol/) over five months to identify the use of sinophobic racist slurs. They found increasing linguistic racism on both platforms. For example, the use of the sinophobic term “Kungflu” on /pol/ after January 2020 and the emergence of “asshoe” on Twitter aims to make fun of Chinese accents speaking English.

Not long ago, Duong et al. (2020) conducted a study exploring Twitter users' opinions on the COVID-19 pandemic focusing on university students. They found the college community remained aware and vocal in addressing racist problems related to President Trump's references to COVID-19 as the "Chinese virus" (Duong et al., 2020). However, many students developed aggression towards the Chinese community, blaming them for starting the pandemic and resulting in nationwide limited social interaction and school closures (Duong et al., 2020).

Litam and Oh (2020) studied the potential effects of COVID-19 racism on Chinese Americans' levels of depression. The results showed that COVID-19 related racism mediated the Chinese American's life satisfaction and depression. In addition, many researchers confirmed that racism and discrimination have a negative impact on student engagement and belongingness (e.g., Karuppan & Barari, 2011; Martirosyan et al., 2019; Mwangi, 2016). Thus, it is important to understand Chinese international students' experience with racism, whether online and in-person, during this difficult time.

The Current Study

The current study adopts Astin's Theory of Student Involvement, along with Strayhorn's Model of College Students' Belonging, including the relationship between engagement and belongingness as the basic framework. Student engagement and belongingness are critical indicators of student success and other long-term outcomes, like overall well-being. This study seeks to understand Chinese international students' experiences with engagement and belongingness, and subsequently examines the relationship between engagement and belongingness among this group of students during a time of a global health crisis and national political and social unrest.

After conducting an extensive literature review in these fields, several gaps were evident specific to the Chinese international student population, including the lack of a comprehensive and reliable scale that measures Chinese international students' engagement and belongingness in U.S. universities. The literature review and established research was used to identify important constructs needed to develop a new scale to accurately measure Chinese students' sense of belonging situated within the dominant framework of Bronfenbrenner's Ecological Systems theory. This study contributes to the literature on Chinese students' sense of belonging by accounting for the influence of language barriers, time in the U.S., institutional support and racism on their engagement and belongingness and in doing so will deepen our understanding of international students' experiences in post-secondary settings and will advance measurement in the field.

Chapter III: Methodology

Research Design

This study's primary purpose is to investigate the relationship between student engagement and belongingness among Chinese international students using a non-experimental quantitative research design, specifically an internet-based survey design. A follow-up focus group was conducted with participants at one university to provide more in-depth explanations about the research questions and confirmation for the quantitative results. This chapter describes the methods and procedures used to conduct the study. This chapter also details the instrumentation and measure development, the data collection and analysis process used for both quantitative and qualitative phases. The chapter concludes with a discussion of the study limitations regarding its design.

Researcher's Positionality

My own background and experiences have influenced the study design and implementation. I am a Chinese international student in the U.S. After I graduated from high school, I decided to come to the US for post-secondary education. Before I came to the U.S., I knew no one and had zero connections on this foreign land. The universities I attended provided various activities and resources to support me educationally, socially and culturally. I eventually adjusted to a different culture, connected with diverse people around me, and started to make a commitment to and become more fully integrated into these universities. It is profoundly important to me that international students experience a positive environment like I do, especially under global pandemic and complex political situations. International students depend heavily on universities, we rely on universities to help navigate challenges on language, cultural barrier, and mental health. Taking Astin's (1994) student-centric approach, my goal

was to investigate students' level of engagement and belongingness and conduct research that can inform and improve the support system for international students' better college experience.

Research Questions

The following research questions informed the study design:

RQ 1.1: Are there measurement invariances in engagement based on demographic and personal characteristics such as gender, extraversion, degree and major (STEM vs. Non-STEM) of Chinese international students?

RQ 1.2: Are there measurement invariances in belongingness based on demographic and personal characteristics such as gender, extraversion, degree and major (STEM vs. Non-STEM) of Chinese international students?

RQ 2: What is the relationship between engagement and belongingness with Chinese international students after controlling for English proficiency, time in the U.S., institutional support and perceived racism?

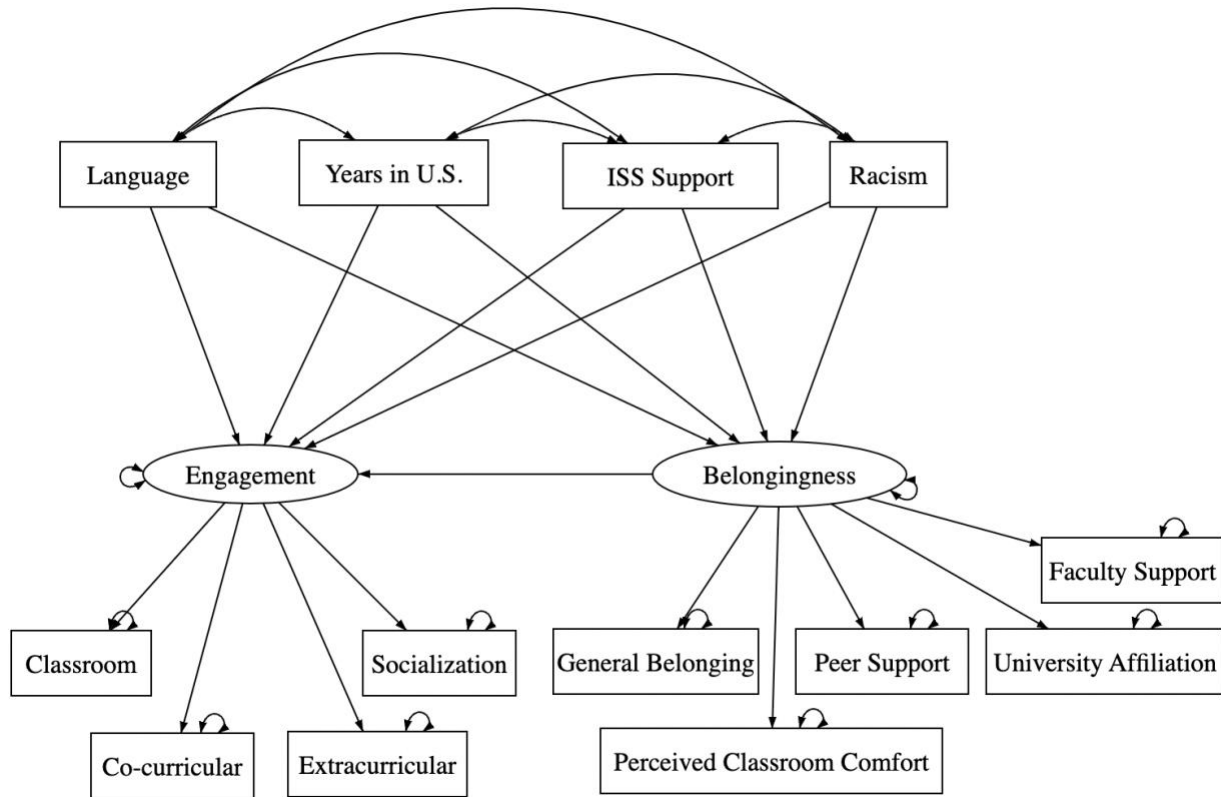
RQ 3: What are the associations between English language proficiency, time in the U.S., institutional support, racism, and engagement?

RQ 4: What are the associations between English language proficiency, time in the U.S., institutional support, racism, and belongingness?

The following path diagram was proposed. This study emphasized on constructing two latent outcome variables engagement and belonging; investigating group invariances with RQ 1, how belongingness effected engagement with RQ 2 and how predictors including English proficiency, time in the U.S., International Student and Scholar office (ISS) support and racism influenced the outcomes with RQ 3 and 4 (See Figure 6).

Figure 6

Hypothesized Path Diagram for Main Study Variables



Instrumentation

The survey had a total of 84 items including 36 engagement items, 24 items to measure belongingness, eight demographic or personal characteristic items, and 16 items related to the four predictors. More detailed information was discussed below.

Demographic Information and Predictors

At the beginning of the survey, participants responded to questions about their nationality and if they identify themselves as Chinese international students. The survey collected demographic information including gender, institution, extraversion and four predictors including English proficiency, time in the U.S., ISS support and perceived racism (See Table 4.1 and 4.2 for details, See Appendix A for all items). Items of extraversion,

English proficiency, ISS support and racism were assessed with internal consistency, and they all reported good reliability.

Table 4.1

Demographic Information

Demographic (8 items)	α	Measures
Gender	N/A	<i>1=Female, 2=Male, 3=Nonbinary</i>
University	N/A	
Major	N/A	
Degree	N/A	Graduate vs. Undergraduate
Extraversion (4 items)	0.82	Mini International Personality Item Pool (Mini IPIP) (Donnellan et al., 2006) Four items from <i>1 (very inaccurate) to 5 (very accurate)</i>

Table 4.2

Predictors

Predictors (16 items)	α	Measures
Language (4 items)	.86	Self-reported proficiency level in reading, writing, speaking, and listening <i>1=Below basic, 2=Basic, 3=Low-Intermediate, 4= High-Intermediate, 5=Advanced</i>
Time in the U.S.	N/A	Report in years Satisfaction with ISS services (See Table 3) <i>0= Not Applicable</i>
ISS Support (5 items)	.83	<i>1= Very dissatisfied, 2= Dissatisfied, 3= Neutral, 4= Satisfied, and 5= Very Satisfied</i>
Perceived Racism (6 items)	.91	Online: Adapted from Online Victimization Scale for Adolescents (Tynes et al., 2010) In-person: Adapted from Racial and Ethnic Microaggressions Scale (Nadal, 2011) and Asian American Racism-Related Stress Inventory (Miller et al., 2012) <i>1=Always, 2=Very Often, 3=Sometimes, 4=Rarely, 5=Never</i>

Engagement

Student Engagement is considered a variable with four subscales: classroom engagement, co-curricular activities engagement, extracurricular activities engagement and socializing. Items were generated based on NSSE (NSSE, 2021) and other literature including

Bartkus et al. (2012), Eccles et al. (2003) and etc. Participants reported on the frequency they had invested and effort they would invest in previous listed activities. For example, an item of academic engagement is “contribution to course discussions.” Participants were asked the frequency they made contribution to course discussion in a classroom and their plans on engaging in course discussion in the future. Participants were asked to respond to these items on a 5-point Likert scale (1= Never, 2= Rarely, 3= Sometimes, 4= Often, 5= Very often). The scores on all items within each subscale were averaged to indicate the overall score. Classroom engagement had eight items ($M= 3.60$, $SD= .72$) and had the internal consistency of .92; Co-curricular Activities Engagement consisted of four items ($M= 2.38$, $SD= .51$), and the internal consistency of .51; Extracurricular Activities Engagement had 14 items ($M= 2.49$, $SD= .76$) and had good reliability of .90; finally, socializing had 10 items ($M= 3.27$, $SD= .74$) and acceptable reliability of .72. All items showed acceptable reliability for further analyses (See Table 4.3.1 for examples and descriptive statistics and Appendix A for all items). In addition, the correlation matrix showed that all engagement subscales are positively correlated with each other and demonstrated no multicollinearity (See Table 4.3.1 for engagement correlation matrix).

Table 4.3.1

Engagement Subscales Cronbach’s Alphas, Means, Standard Deviations and Examples

Subscales (36 items)	α	M	SD	Example Items
Classroom Engagement (8 items)	.92	3.60	.72	-Contributed to course discussions -Discussed course materials with an instructor
Co-curricular Activities Engagement (4 items)	.77	2.38	.51	-Studying and other academic activities outside of class -Participating in an internship

Extracurricular Activities Engagement (14 items)	.90	2.49	.76	-International student organizations -English language practicing programs/groups
Socializing (10 items)	.78	3.27	.74	-Socialized with Chinese international students -Socialized with students <i>other than</i> Chinese international students

Table 4.3.2

Engagement Subscales Bivariate Correlations

Variables	(1)	(2)	(3)	(4)
(1) Classroom Engagement	1.00			
(2) Co-curricular Activities Engagement	.27	1.00		
(3) Extracurricular Activities Engagement	.33	.02	1.00	
(4) Socializing	.53	.11	.57	1.00

Belongingness

Existing Belongingness Instruments. The Psychological Sense of School Membership (PSSM) scale is a questionnaire that has been used extensively in various studies investigating students’ sense of belonging. The PSSM was initially developed by Goodnow (1993) and had 18 items. A recent study focused on Turkish and Moroccan minority students’ discrimination, engagement and belongingness in a secondary school used the adapted version of PSSM (Heikamp et al., 2020). The adapted version has five items, including “I feel at home at this school.” and has a Cronbach alpha of 0.84 and 0.87 for Moroccan and Turkish subsamples respectively (Heikamp et al., 2020).

It is important to note that Goodnow developed PSSM to measure middle school students, so the predictive power for international students at the college level is less clear. William (2014) adapted a few questions in NSSE that measure students’ perspectives on whether they felt connected with peers and supported by institutions to operationalize

belongingness. However, the results are less convincing because 1) NSSE is not intended to measure belongingness, questions were designed with a focus on connectedness and intuitional support, and 2) William (2014) did not specify validity and reliability within the context of this specific sample.

Stebleton et al. (2014) and Van Horne et al. (2018) administered SERU to their participants, Stebleton et al. (2014) focused on immigrant students, and Van Horne et al. (2018) focused on international students. Similar to PSSM, the SERU includes items that relate to general belongingness, as Van Horne et al. (2018) included two items “Knowing what I know now, I would still choose to enroll at this campus” and “I feel that I belong at this campus” in their PCA component of belongingness. Other researchers used qualitative research methods to explore deeper understandings of specific groups of international students’ belongingness within a particular environment (e.g., Chinese students’ belongingness in residence halls, Yao (2014); Black international students’ belongingness at an HBCU (historically Black colleges and universities), Mwangi (2016).

In general, researchers tended to use items in established comprehensive surveys like NSSE and SERU to investigate belongingness with existing items because of the limited amount of literature and measures available on international student belongingness. In contrast to PSSM and SERU that measure general belongingness with relatively general questions, Hoffman et al. (2002) developed a questionnaire to measure college students’ sense of belonging based on focus group interviews. The questionnaire represented five indicators: perceived peer support, perceived faculty support, perceived classroom comfort, perceived isolation, and empathetic faculty understanding (Hoffman et al., 2002). Hoffman’s scale measures multiple aspects of belongingness that are consistent with Strayhorn’s definition of a

college student's belongingness. This definition also includes perceived support on campus from faculty and peers, a feeling connectedness, and the experience of mattering or feeling cared about. In addition to these items relevant to college experiences, a scale developed to measure general belongingness influenced the instrumentation used in the present study.

Malone et al. (2012) recognized the importance of developing a psychometrically sound measure of belongingness. They created the General Belongingness Scale (GBS), a two-factor structure that contains 12 items. The two factors are acceptance/inclusion and lack of rejection/exclusion. Items are rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), with higher scores representing stronger general belongingness. Example items include, "When I am with other people, I feel included" and "I feel like an outsider." Malone et al. (2012) reported internal reliability of 0.95 for the GBS.

GBS demonstrated convergent validity as evidenced by strong correlations with other measures of belongingness (e.g., Sense of Belonging Instrument-Psychological Experiences (SOBI-P); Sense of Belonging Instrument-Antecedents (SOBI-A); Social Connectedness Scale, (Lee & Robbins, 1995)) and loneliness (Short version of the UCLA Loneliness Scale (ULS-8)) (Malone et al., 2012). Malone et al. (2012) argued that GBS measures achieved belongingness, thus should be moderately different from the need to belong. Evidence of discriminant validity was obtained as the GBS was shown to be different from the need to belong (Need to Belong Scale, Leary et al., 2006) and social assurance (Social Assurance Scale, (Lee & Robbins, 1995; Malone et al., 2012). Predictive validity evidence was established as acceptance/inclusion strongly predicted life satisfaction (Satisfaction with Life Scale, (Diener et al., 1985)) and happiness (Subjective Happiness Scale, (Lyubomirsky & Lepper, 1999)). Rejection/exclusion strongly predicted depression (Center for Epidemiologic Studies Depression Scale (CESD,

Radloff, 1977) simultaneously (Malone et al., 2012). These comprehensive sources of validity of evidence suggest that the GBS is a reliable and valid measure of achieved general belongingness.

Measuring International Students' Belongingness at Universities. In this current study, belongingness was measured by adapting the following scales: the General Belongingness Scale (GBS) (Malone et al., 2012) and the Sense of Belonging scale by Hoffman et al. (2002). The original GBS contains items like "I have close bonds with family and friends" and "Friends and family do not involve me in their plans." Because most international students have their families in their home countries, items were modified to "I have close bonds with friends" and "Friends do not involve me in their plans." After changing these two items, the adapted GBS includes a total of 12 items: six measuring acceptance/inclusion and six measuring rejection/exclusion. Malone et al. (2012) reported the internal reliability of 0.95 for the original scale.

A second measure of belongingness was adapted from the Sense of Belonging scale by Hoffman et al. (2002). The original scale represented five indicators: perceived peer support, perceived faculty support, perceived classroom comfort, perceived isolation, and empathetic faculty understanding (Hoffman et al., 2002). These same groups of researchers revised the scale to combine perceived faculty support and empathetic faculty understanding into one factor (Morrow et al., 2002). Perceived isolation will be excluded because GBS has similar items, for example "Because I do not belong, I feel distant during the holiday season", and "I feel isolated from the rest of the world" (Malone et al., 2012).

This current study adapted items from the GBS and Hoffman et al. (2002) and generated five indicators including general belongingness, university affiliation, perceived peer

support, perceived faculty support, and perceived classroom comfort. The internal consistency for all subscales were above .70 except university affiliation had an alpha of .48 (See Table 4.4.1 for examples and descriptive statistics; Appendix A for all items). The correlation matrix demonstrated positive correlations between belongingness subscales and no multicollinearity (See table 4.4.2 for correlation matrix).

Table 4.4.1

Belongingness Subscales, Cronbach's Alphas, Means, Standard Deviations and Examples

Subscales (24 items)	α	M	SD	Example Items
GBS (12 items)	.89	4.79	1.04	Acceptance/Inclusion: -When I am with other people, I feel included Rejection/Exclusion: -Because I do not belong, I feel distant during the holiday season
University affiliation (3 items)	.48	4.86	0.98	-I tend to associate myself with my university. -When I meet someone for the first time off-campus, I would like to talk about my university. -I am glad I attend my university.
Perceived peer support (3 items)	.70	5.36	1.13	-I am treated with as much respect as other students. -I have developed personal relationships with other students in the class. -If I miss class, I know students who I could get the notes from.
Perceived faculty support (3 items)	.73	5.18	1.19	-I feel comfortable seeking help from a faculty member outside of class time (office hours etc.) -I feel that a faculty member would be sensitive to my difficulties if I shared them. -I feel that a faculty member would make extra effort to help me if I needed it.
Perceived classroom comfort (3 items)	.95	5.04	1.12	-I feel comfortable contributing to class discussions. -I feel comfortable asking a question in class -I find it easy to join study groups with other students if I wanted to

Note: Response on the scale- N/A, Strongly disagree, Slightly Disagree, Disagree, Neither Agree or Disagree, Slightly Agree, Agree, Strongly Agree.

Table 4.4.2*Belongingness Subscales Bivariate Correlations*

Variables	(1)	(2)	(3)	(4)	(5)
(1) GBS	1.00				
(2) University Affiliation	.36	1.00			
(3) Peer Support	.63	.45	1.00		
(4) Faculty Support	.24	.30	.45	1.00	
(5) Classroom Comfort	.51	.26	.57	.46	1.00

Pretesting*Procedure*

The researcher generated a pool of 84 items from literature related to international students' engagement and belongingness. A pretesting procedure was included to analyze the significance and relevance of items. Three experts, including a researcher in the educational measurement field, a director of International Student Education Center at a Research 1 university and the director of the Assessment Office of Student Affairs reviewed the items for face validity and clarity. The number of initial items were reduced and revised based on experts' reviews and discussion. A think-aloud session was carried out with recent graduates of Chinese international students. A think-aloud is a procedure where people who are similar to the intended study participants read the questions out loud, explain their thought processes when interpreting the items and how they determined their answers (Becho, 2019). Think-aloud helped identify minor formatting issues with the administration platform- QuestionPro, and questions that were confusing or misleading which resulted in additional revisions to the measure.

Full Study: Quantitative Survey*Participants*

Survey participants were recruited using a non-random, convenience sampling procedure. Survey data were collected from Chinese international students in different universities in the U.S. To account for the maximum variation in this phase of the study, this study intentionally selected U.S. universities that the researcher has a connection with (knows Chinese international students there). The response rate was not clear for this study because of the recruiting methods included social media.

86 Chinese international students participated in the survey, 10 of these respondents were excluded because they only completed questions on the first page (less than 15% completion). Thus, a total of 76 complete responses were recorded to perform further quantitative analyses. On average, the participants had been in the U.S. for 4 years, with 42 (55.3%) graduates and 14 (18.4 %) undergraduate students; other students selected “other” or skipped the question. Out of 46 students who provided their majors, 22 were STEM, 24 were non-STEM majors based on the U.S. Department of Homeland Security (DHS) STEM Designated Degree Program List. The majority participants were female (n=37, 48.7%), 16 (21.1%) of them were males, four (5.3%) students identified themselves as non-binary and three preferred not to answer this question.

Procedures

All procedures took place remotely. After obtaining IRB approval, the researcher contacted the International Student Office and Chinese student organizations in each university by emails (See Appendix B). She also joined Chinese International students’ Wechat group, which is the primary message and social tool Chinese students use. Both formal and informal invitations were sent out by the International Student Office via emails (See Appendix C), Chinese student organization leaders and the researcher via social media (See Appendix D) in

each institution on March 19th, 2022. To increase the response rate, follow-up emails and social media posts that invited students to participate were sent out again the following weeks (March 28th, 2022; April 4th, 2022).

The survey was administered through QuestionPro. Prior to the consent (information sheet), participants answered a question if they identify as a Chinese international student (See Appendix A). The following definition was provided: “for this study, Chinese international students were defined as individuals who were Chinese nationals and came to the U.S. to pursue higher education. These may include holders of F (student) visas, H (temporary worker/trainee) visas, J (temporary educational exchange-visitor) visas, and M (vocational training) visas. If you identify yourself as Immigrants, refugees and who participate in short-term educational programs (e.g., language, volunteer programs), please do not proceed”. On the following page, there was information regarding research purpose, risks and incentives (See Appendix E). The participation was solely voluntary, and confidentiality was ensured. Participants could withdraw at any stage of completing the survey. Completion of the survey was incentivized with an opportunity to win one of five \$20 Amazon gift cards. Finally, participants were asked to select “yes” or “no” on whether they were older than 18 years old. If “yes” was selected, the survey would proceed to items, and if “no” was selected, the thank-you page would present, and the survey would end.

Analysis

Data Management. All data was entered in Stata 15 and performed data preparation and management. Kline (2015) suggested the following in data preparation. First, extreme collinearity might be detected using correlation matrix, and $r > 0.90$ indicates extreme collinearity. Kline (2015) emphasized either removing variables or combining the redundant

ones. Then, Cook's Distance were analyzed for multivariate outliers, prompting decisions as to whether to perform a listwise deletion or reduce the effect of such extreme values. Third, multivariate normality should be evaluated, the default SEM estimation method including CFA, has the pre-assumption of multivariate normality (Kline, 2015). Lastly, missing data were assessed with Little's MCAR test in Stata 15. The detailed procedure was explained in Chapter IV.

CFA. Measurement models were fit to provide construct validity before fitting the full model. Researchers suggested a sample size of 100 or preferably 200 for a CFA (Kline, 2015). In this study, separate CFA models were fitted for engagement and belongingness because of the limited sample size (N=76). Fit statistics including chi-square tests, RMSEA, CFI and TLI were used to measure model fit. Stata's (GSEM) feature was used to address measurement invariance between groups by gender, extraversion, degree and major (STEM vs. Non-STEM). These analyses were meant to confirm consistent response patterns with Chinese international students in different groups.

Structural Equation Modeling. This study tested the proposed model to investigate the following hypotheses.

Hypothesis 2 There is a positive causal relationship between Chinese international students' belongingness and engagement, Chinese international students' belongingness positively predicts their engagement.

Hypothesis 3.1 English proficiency positively predicts Chinese international students' engagement in the model.

Hypothesis 4.1 English proficiency positively predicts Chinese international students' belongingness in the model.

Hypothesis 3.2 Time in the U.S. positively predicts Chinese international students' engagement in the model.

Hypothesis 4.2 Time in the U.S. positively predicts Chinese international students' belongingness in the model.

Hypothesis 3.3 ISS support positively predicts Chinese international students' engagement in the model.

Hypothesis 4.3 ISS support positively predicts Chinese international students' belongingness in the model.

Hypothesis 3.4 Perceived Racism negatively predicts Chinese international students' engagement in the model.

Hypothesis 4.4 Perceived Racism negatively predicts Chinese international students' belongingness in the model.

Given the nature of these hypotheses and the proposed model (Figure 6), instead of multiple regression, SEM is the most suitable method to use for several reasons. First, multiple regression does not allow the inclusion of both latent and observed variables in the model. Second, investigating the interactions between the predictors and the outcomes are the focus of this current study, and multiple regression is limited in measuring the comprehensive interrelationship in the model and assessing model fit.

Kline (2015) suggested the following steps to be followed when conducting SEM analyses.

1. Specify the model.
2. Evaluate model identification (if not identified, go back to step 1).

3. Select the measures (operationalize the constructs) and collect, prepare, and screen the data.

4. Estimate the model:

a. Evaluate model fit; if poor, respecify the model, but only if doing so is justifiable (skip to step 5); otherwise, retain no model (skip to step 6).

b. Assuming a model is retained, interpret the parameter estimates.

c. Consider equivalent or near-equivalent models (skip to step 6).

5. Respecify the model, which is assumed to be identified (return to step 4).

6. Report the results. (p.118)

Model Specification. Kline (2015) described model specification as the most important step. The hypothesized model in Figure 1 was also the path diagram. Predictors included language, time in the U.S., ISS support and racism. Outcomes were student engagement and belongingness. In addition, latent variables were denoted in eclipses and observed/measured variables in rectangles.

Model Identification. Kline (2015) wrote, only when the model is identified, it is possible for the computer program to estimate a unique solution for each parameter. Thus, the model must have more observed pieces of information (known parameters) than unknown parameters.

Model Estimation. Maximum likelihood is the most common method used for estimation in SEM. Fit indices were reported in chi-square test statistic (CMIN; ≤ 4.0); comparative fit index (CFI; $\geq .90$); the root means square error of approximation and (RMSEA; $\leq .10$); and the standardized root mean square residual (SRMR; $\leq .10$). Some of these fit

indices are sensitive to sample size, so the “combination rule” was used for concluding “acceptable fit.”

Model Re-specification. If the model fit is poor, the model should be re-specified based on theories.

Full Study: Follow-up Focus Group

Participants

Six Chinese international students were recruited from a public research university located on the East Coast. This university is home to more than 1,200 international students, accounting for approximately 4% of the student population. There were 138 Chinese international students enrolled in this university during the 2021 spring semester. The focus group participants were all female and included four graduate and two undergraduate students.

Procedure

The focus group protocol was developed based on the conceptual framework for engagement and belongingness (see Appendix F). It had three general topics accordingly, engagement, belongingness and factors. More specific topics including classroom engagement; relationship with faculty, staff and students; co-curricular activities; extra-curricular activities; socialization and belongingness were asked as follow-up questions.

The researcher contacted the International Student Office or the Global Education Office at that university to recruit Chinese international students via email (See Appendix G and H). The participation was completely voluntary and those who agreed to participate in the interview had re-consented. An information sheet that explained the study purpose, risk of this study and incentives was sent to participants after the interview was scheduled (Appendix I).

An explanation of the study's purpose and confidentiality was provided again prior to the focus-group interview. A \$10 Amazon gift card was given to the participants after the interview.

To increase Chinese international students' participation and engagement in a group interview setting, the focus group was conducted in Mandarin Chinese. The session took place via Zoom for one hour and was audio recorded. The voice recording was submitted to Xunfeitingjian (讯飞听见) to be transcribed, and transcription was reviewed to ensure accuracy and to remove any identifying information before the transcription was imported into Atlas.ti - a qualitative data analysis software program for analyzing. After coding in Atlas.ti, emerging themes were generated into different word documents. Some example quotes were translated into English by the researcher who is bilingual in English and Mandarin Chinese and were included in the result section.

Chapter IV: Results

This chapter describes the survey data cleaning and management. Before conducting CFA on both latent variables (engagement and belongingness), assumptions were evaluated, and model fit statistics were introduced. Given the exploratory nature of this study, CFAs were conducted to ensure the indicators represent the latent constructs- engagement and belongingness well. After fitting the CFA models, research question one that asked for group differences was answered with measurement invariance models. Then this chapter proceeded to fit the hypothesized structural model, and provided answers for research questions two, three and four. Lastly, to strengthen the study design, in part due to the small sample size, a follow-up focus group was conducted with five Chinese international students from a university, the results were discussed to supplement the survey data finding.

Data Cleaning and Management

A total of 86 responses were exported directly from QuestionPro into Microsoft Excel and were checked for duplicates and completeness. 10 responses were deleted listwise because the completion rate is less than 15% despite being recorded as completed by QuestionPro. As a result, 76 responses were entered in Stata 15 to perform analyses and fit the hypothesized SEM model. Given that large datasets are typically required to perform CFA and SEM, sample size may limit some of the explanatory power. More discussion regarding sample size limitations is included in Chapter five. However, this was an exploratory study to address some of the interesting relationships between variables related to Chinese international students. Data management included the transformation of continuous variables into dummy/categorical variables to perform multi-group CFAs, computing scores for predictors including language,

racism, ISS support (See Table 4.2) and outcomes including Engagement and Belongingness subscales (See Table 4.3, 4.4).

Data Assumption and Model Fit Indices

Several assumptions were evaluated before fitting the measurement model for Engagement and Belongingness. Upon analyzing missing data with Little's MCAR (Little, 1988) test in Stata 15, the data were likely not missing at completely random (MCAR) ($p < .05$). The pattern of missingness was evaluated with "misstable summarize, all" Stata function. Overall, missingness was related to item non-responses, more specifically, engagement items at the beginning of the survey had fewer missingness; missingness increased with belongingness items and even more for endogenous and demographic variables (which were placed at the end of the survey). Based on this observation, missingness was not dependent on any other variables or observed factors but participants' attrition. In subsequent analyses, more robust estimation procedures were applied in Stata using the option "method(mlmv)". This option, which uses full information maximum likelihood (FIML), allowed all information available to be used even with missing data (does not use listwise deletion) (Acock, 2013); and after applying "method(mlmv)", all fitted models had an $n=76$. Joint normality is one of the assumptions to use this option and to fit CFA models, it was assessed with "mvtest normality" with four available tests in Stata, Doornik–Hansen (2008) omnibus test, Henze–Zirkler's (1990) consistent test, Mardia's (1970) measure of multivariate kurtosis and skewness (See Table 5). The results showed that the null hypothesis of multivariate normality for the engagement variables was retained; for the belongingness variables, only Mardia's (1970) measure of multivariate kurtosis is not significant; and for all variables, the normality results were mixed; omnibus test and the skewness test were significant, the other two were

insignificant. Because the mixed indication of normality was presented with test results, the Huber-White sandwich estimator, or the quasi-maximum likelihood estimation (QML) that does not assume normality was used for model estimations.

Table 5

Multivariate Normality Hypotheses Testing (p-value)

Variables (number of variables)	Doornik–Hansen (2008) omnibus test	Henze–Zirkler’s (1990) consistent test	Mardia’s (1970) measure of multivariate kurtosis	Mardia’s (1970) measure of multivariate skewness
Engagement (4)	.27	.48	.35	.09
Belongingness (5)	< .001	< .001	0.26	< .001
Engagement & Belongingness (9)	< .001	.67	.17	.008

These data also satisfied other assumptions specific to continuous data, mild to moderate correlation but lack of extreme multicollinearity (See Correlation in Table 4.3.2 and 4.4.2). The Cronbach’s alpha scores were sufficient for all variables except for university affiliation ($\alpha=0.48$), which is expected with only 3 items. Cook’s Distance was graphed to determine outliers that were significantly different from the rest. No outliers were found for this dataset.

Kline suggests using a variety of fit indices to assess SEM model fit (2015). The primary indices is the chi-square test, which a non-significant p-value indicates good fit. However, the chi-square test (χ^2) is sensitive to sample size (nearly always significant when $N>400$) (Kline, 2015), thus other fit indices should also be used. They include comparative fit index (CFI; $\geq .95$, good fit; $\geq .90$, adequate fit); Tucker-Lewis index (TLI; $\geq .95$, good fit; $\geq .90$, adequate fit); standardized root-mean-square residual (SRMR; $\leq .06$, good fit; $\leq .08$, adequate fit); and root-mean-square error of approximation (RMSEA; $\leq .05$, good fit; $\leq .08$,

adequate fit) (Keith, 2019; Kline, 2015). In addition, Stata does not provide SRMR with option “method(mlmv)”, thus only chi-square test statistics, CFI, TLI and RMSEA were included in this study to assess model fit.

Measurement Models of Engagement and Belongingness

CFAs were conducted to investigate the factor structure of engagement and belongingness (See Figure 7). The final measurement model for engagement includes three indicators, classroom engagement, extra-curricular engagement, and socialization. Co-curricular engagement indicator was eliminated because of the low factor loading 0.22; and the three-point response scale adopted from NSSE (do not plan to do, plan to do, done or in progress) may be problematic if treated as continuous data, future study should adapt co-curricular engagement items that are suitable for factor analyses. After removing the co-curricular engagement indicator, the factor loadings were significant ($p < .001$) and between .45 to .89. The measurement model for belongingness had five indicators and are all significant ($p < .001$) and range from .49 to .86, which indicated the latent variable belongingness can be explained by these indicators at a medium to high level. Table 6 presented the fit indices for the two measurement models that demonstrated strong fit, since the engagement CFA model was just identified (perfect fit), factor loadings of the classroom engagement and socialization indicators were constrained to be equal to get model fit information.

Figure 7

Estimated Factor loadings for Engagement and Belongingness Measurement Models

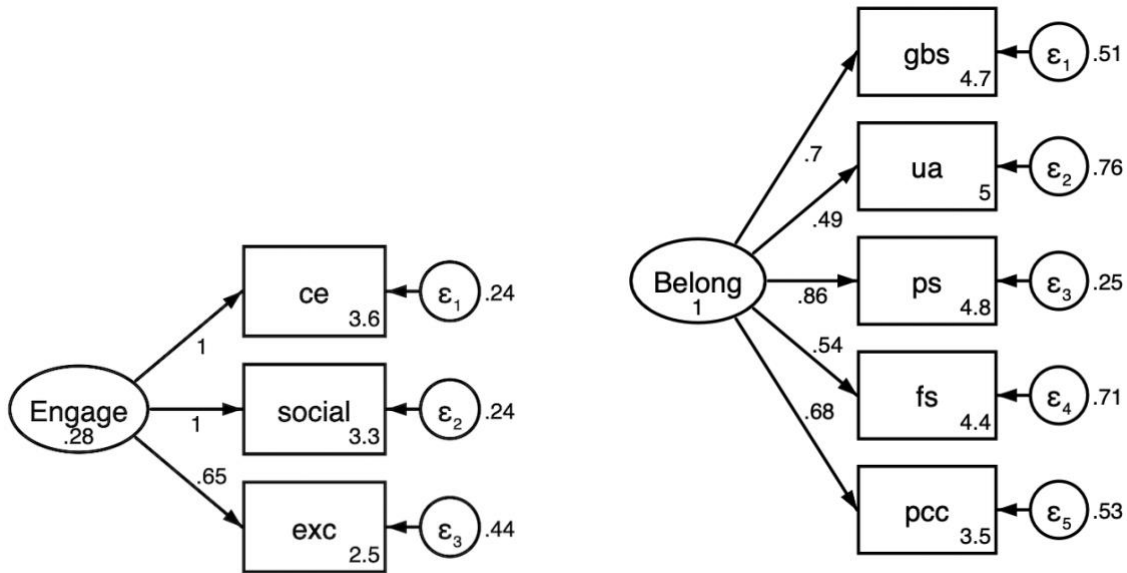


Table 6

Model fit for Engagement and Belongingness Measurement Models

Construct	<i>df</i>	χ^2	RMSEA [90% CI]	CFI	TLI	R ²
Engagement	1	.25	.06 [.00, .32]	.99	.97	.72
Belongingness	5	.26	.07 [.00, .19]	.98	.97	.85

The Invariance Analyses of Measurement Models

Analyses of Research Question 1

Research question 1.1 and 1.2 were proposed to investigate the multi-group invariance of the engagement and belongingness between demographic variables, gender, extraversion, STEM vs. Non-STEM. It was important to examine invariance first because it provided evidence of the construct validity across specific groups. The questions were:

RQ 1.1: Are there measurement invariances in engagement based on demographic and personal characteristics such as gender, extraversion, degree and major (STEM vs. Non-STEM) of Chinese international students?

RQ 1.2: Are there measurement invariances in belongingness based on demographic and personal characteristics such as gender, extraversion, degree and major (STEM vs. Non-STEM) of Chinese international students?

Group invariance was tested with Stata's (GSEM) feature. Some notable syntax features included option *group()* to fit the model separately for different groups; option *ginvariant(none)* to allow all parameters to vary between groups. In order to fit the CFA models that allow distinct intercepts, coefficients, and variances of the latent variable across groups, option *mean(The_latent_variable@0)* was added to assume the latent trait is centered at zero for both groups. The final step was to apply a likelihood-ratio test to compare the parameters-constrained model with the distinct parameters model to know whether differences occurred between different groups of students.

Research Question 1 Results

Gender, major and degree were re-coded into dichotomous variables to be tested for research question 2 (See Table 7). Some students' groups include who identify their gender as non-binary (n=4) and degree seekers that did not identify as undergrads and graduate (n=2) were excluded in this analysis. Extraversion was re-coded based on the interpretation rule on the International Personality Item Pool (IPIP) website. Since the score is normally distributed, scores within one-half SD of the mean are "average", the rest are classified as "low" and "high" (IPIP, 2022) (See Table 7).

Table 7

Group Variables to Test Invariance

Modified Variables	Levels	N
Gender	Female	37
	Male	16
Major	STEM	22
	Non-STEM	24
Degree	Undergraduate	42
	Graduate	14
Extraversion	Low	17
	Average	19
	High	25

Multigroup tests revealed the models with distinct parameters did not improve fit compared to the model with all parameters constrained except for extraversion in engagement, degree in belongingness, and gender in belongingness was approaching significance (See Table 8). As a result, female and male Chinese international students in this sample did not differ in their pattern of responses for the engagement and belongingness constructs. There were no model invariances measured between STEM and non-STEM major students, and between undergraduate and graduate students in engagement. The belongingness measurement model was not invariant between undergraduate and graduate, extraverted and less extraverted Chinese students.

Table 8

Measures of Invariance between Non-constrained and Fully Constrained Measurement Model

	Engagement	Belongingness
Gender (Female VS. Male)	$\chi^2 (8) = 3.11, p = .93$	$\chi^2 (15) = 24.46, p = .057$
Major (STEM VS. Non-STEM)	$\chi^2 (8) = 9.50, p = .30$	$\chi^2 (15) = 17.37, p < .05$
Degree (Undergraduate VS. Graduate)	$\chi^2 (8) = 9.53, p = .30$	$\chi^2 (15) = 25.68, p = .30$

Extraversion (Low VS. Average VS. High) $\chi^2 (16) = 36.95, p < .01$ $\chi^2 (22) = 28.75, p = .15$

However, students with low, average, and high extraversion were measured invariant regarding engagement; model invariance was also detected in belongingness between students with STEM major and non-STEM major. Because the invariance was detected, researchers suggested either investigate the source of the invariance and re-define models or assume the construct is invariant and discontinue the invariance testing (Putnick and Bornstein, 2016). Sample size is known to impact the power of testing and since this study has extremely sample size in each group, thus the invariance testing was not continued. The following tables (Table 9 and 10) illustrated the different factor loadings between groups regarding the group invariances in CFA models for future references.

Table 9

Extraversion Factor loadings of Engagement Indicators

Indicator	Extraversion		
	Low	Average	High
Classroom Engagement	.59***	.44	.77***
Extra-curricular Engagement	.67***	.41	.48***
Socialization	.78***	.38*	.79***

* represents the significance level (* as $p < .05$; ** as $p < .01$; *** as $p < .001$)

Table 10

Major Coefficients of Belongingness Indicators

Indicator	Major	
	STEM	Non-STEM
General Belongingness	.67***	.70***
University Affiliation	.30**	.57**
Peer Support	.91***	.91***
Faculty Support	.29	.48**
Perceived Classroom Comfort	.43**	.70***

* represents the significance level (* as $p < .05$; ** as $p < .01$; *** as $p < .001$)

The Structural Model

Analyses of Research Question 2, 3, 4

A hypothesized structural model was fit to answer research question 1, 3 and 4 (See Figure 8).

RQ 2: What is the relationship between engagement and belongingness with Chinese international students after controlling for English proficiency, time in the U.S., institutional support and perceived racism?

RQ 3: What are the associations between English proficiency, time in the U.S., institutional support, racism, and engagement?

RQ 4: What are the associations between English proficiency, time in the U.S., institutional support, racism, and belongingness?

Model Specification. The hypothesized model has two outcome variables, engagement and belongingness, which after fitting the measurement model, were defined by three (classroom engagement, extra-curricular engagement, socialization) and four (general belonging, peer support, faculty support, university affiliation and perceived classroom comfort) indicators. As suggested by the literature, four predictor variables were included in the model: English language proficiency, years in the U.S., International Student Office (ISO) support and perceived racism due to COVID-19.

Model Identification. The model was identified in order to find unique estimates for all desired parameters and must include more known parameters than unknown (degrees of freedom (df) >0). Stata indicated this model was overidentified (df= 43). In addition, the model also met the recursive rule that there is no feedback loop and the residual errors were not correlated. Thus, this model was identified to proceed.

Model Fit and Re-specification. After fitting the model in Stata, the results showed that the model had poor fit, $\chi^2(43) = 74.79, p < .01, CFI = .82, RMSEA = .10, R^2 = .65$. The modification indices (MI) and expected parameter change (EPC) statistics indicated several error covariances changes with large MI could be made to improve model fit. These error covariances were added to the model sequentially, and then model fit and MI were re-evaluated. The final model included error covariances between classroom engagement (CE) and perceived classroom comfort (PCC) (MI=11.73, EPC=.45), and classroom engagement (CE) and general belonging (GBS) (MI=11.67, EPC=.40). Table 11 showed the changes of model fit statistics. The final model showed good fit with the χ^2 approaching significance at .045; RMSEA= .07; CFI=.91; and TLI=.89.

Figure 8

Hypothesized Structural model

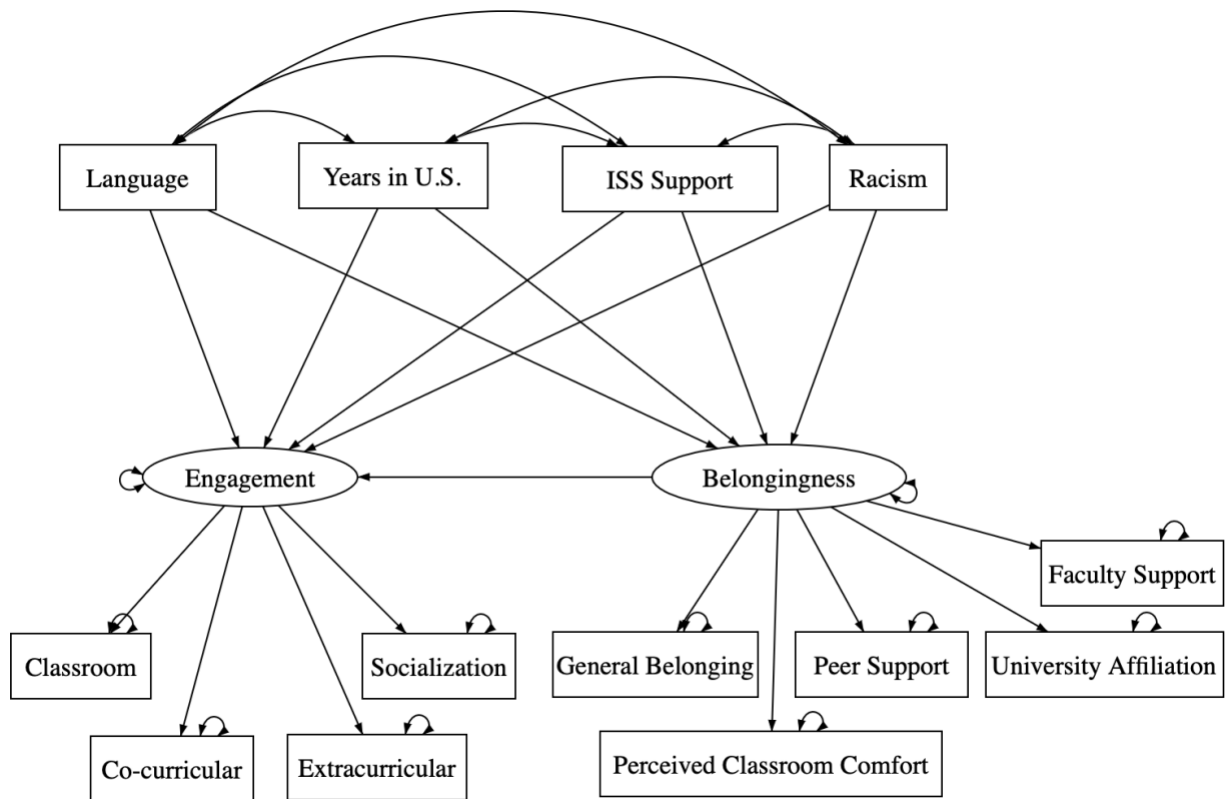


Table 11*Summary of Model Fit Indices*

Models	<i>df</i>	χ^2 (<i>p</i>)	RMSEA [90% CI]	CFI	TLI	R ²
Hypothesized Model	43	74.79 (<.01)	.10 [.06, .14]	.82	.76	.65
Re-specified Model with Error Covariance between CE and GBS)	42	65.64 (<.05)	.09 [.05, .13]	.87	.79	.61
Re-specified Model with Error Covariance between CE and GBS, CE and PCC) (FINAL MODEL)	41	57.43 (=. 045)	.07 [.01, .11]	.91	.89	.58

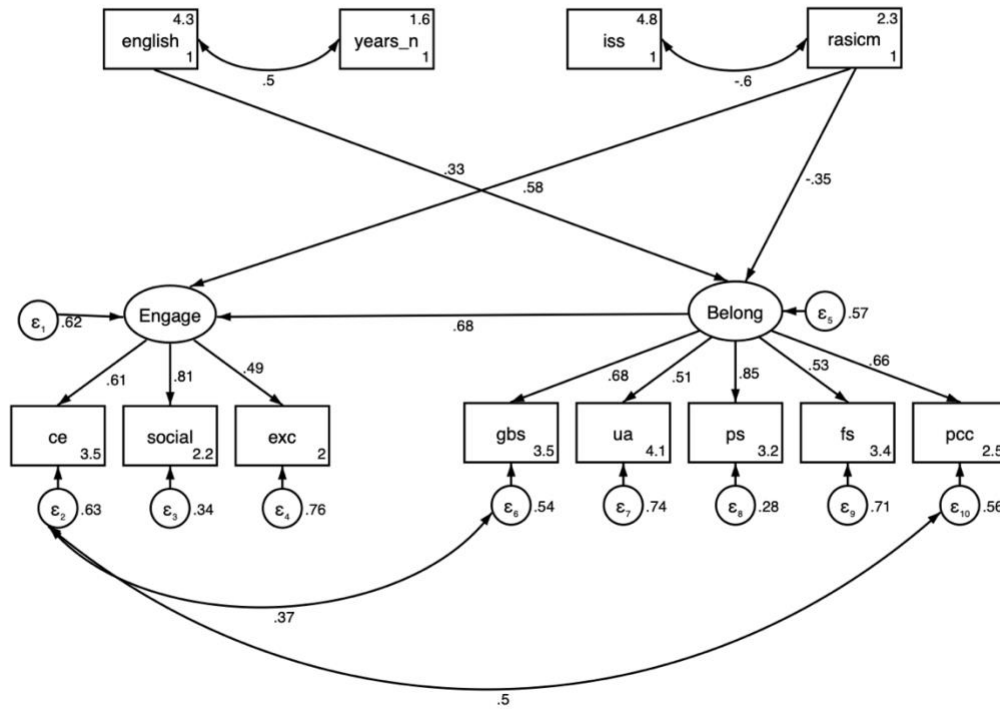
Research Questions 2, 3, 4 Results

Research question two examined the relationship between Chinese international students' engagement and belongingness. As shown in Figure 9, belongingness significantly predicted engagement ($\beta = .68, p < .001$); meaning that Chinese international students who had higher levels of belongingness were more engaged at their university, academically and socially.

In terms of research question three and four, results confirmed that English language proficiency positively predicted student belongingness ($\beta = .42, p < .05$), and perceived racism negatively influenced belongingness ($\beta = -.35, p < .05$), after controlling other predictors in the model. The results indicated the mastery of English language and perceived racism had a direct effect on students' sense of belonging after controlling other predictors in the model. However, in contrast the effect of perceived racism on engagement was positive, which indicated that a higher level of perceived racism associated with COVID contributed to higher levels of engagement in a higher level of engagement after controlling other predictors in the model. The model also showed ISS support had a positive relationship that was approaching significance for belongingness ($\beta = .29, p = .07$).

Figure 9

Final Model with Significant Standardized Path Coefficients



The model had limited explanatory power due to insufficient sample size. In order to explore the model results further, a supplementary focus-group was conducted to investigate Chinese international students’ engagement and belongingness. The focus group asked general questions about engagement and belongingness in the university and also how factors like racism, English language, racism had influenced their experience.

Focus-Group Findings

A qualitative data collection was added to the study design to further understand the survey results and Chinese international students’ engagement experiences and sense of

belonging in one university. This additional data collection added the dimension of student voice to supplement a quantitative survey and strengthen the design.

The purpose of the semi-structured focus-group was to explore and confirm quantitative results and provide more insight into the specific results to address the research questions more fully. There were three main topics addressed in the focus group, including engagement, belongingness and factors which corresponded to the predictors in the quantitative model. An example was “Describe how your academic engagement or experience has been so far at xxx?” (See Appendix F). Five major findings including relationship with faculty and peers, extracurricular activity engagement, socialization, and belongingness, corresponding to the interview protocol emerged from qualitative data analysis. The included quotations were translated from Mandarin Chinese to English and are used to illustrate the themes.

Relationship with Faculty

When asked about classroom engagement, all participants spoke about their relationship with faculty and other students. Two undergraduate students (Abby and Christine) among the six participants mentioned that they barely had any interaction with their academic advisors, except for class registrations.

The participants’ relationships with faculty were positive. Emma, a graduate student said, “all the professors are quite helpful. I remembered taking a few difficult classes in the past, and when I write them an email with questions, they’ll reply to me, so they are pretty nice”. Abby, an undergraduate student, also mentioned the professors are helpful when students have questions. Abby said, “I think my relationship with them [professors] is okay, I meet with them after class and ask questions... Sometimes there will be a lot of questions, and

when I ask them, they are very nice”. Abby also added that because the professors were accessible, it encouraged Abby to ask questions later.

Graduate students Blair, Demi, Emma and Fiona all indicated that they have positive relationships with their Graduate Assistantship supervisor/advisor. Emma mentioned they have developed personal connections

I had a very good relationship with my advisor, because we are a research team, we interact with each other every week, writing research articles and planning projects together. I ask them lots of questions, including various problems in my own personal life. I chat with them, and they will give me advice.

On the other hand, Demi and Fiona added that their relationship with faculty remain professional.

I think it's just a professional relationship, there's no other communication. As far as I think, my American peers can be more connected with faculty. There is still this ‘power distance’ for me. I don't really ask them some questions, such as personal matters.

Overall, I feel a little isolated.

All the undergraduate and graduate students in the group mentioned that it was hard to get connected with faculty when students are only taking their classes for one semester. Fiona, a graduate student in the School of Business explained, “if you ask the professor a question, they will answer it for you in a very timely manner [feeling connected]. But outside of the class, if you don't do research together, then there will be no communication”.

There are other factors that influence Chinese international students’ relationship with faculty. Abby mentioned that a faculty member’s international background influenced the level of support students received, “In fact, I also think that the [identity of] the professor is also

quite a big factor. Because my professor is from another country, and [they are] very concerned about me, because they know that sometimes I can't understand the class [in English], they will ask other students to help me". Blair mentioned their concerns about English proficiency when talking about classroom engagement. However, their inadequate English proficiency did not impact their engagement negatively; in fact, their desire to practice English increased her engagement. Blair said,

When I first came here, my English was not very good... I was a little scared that I might have trouble communicating with others. I was a little worried about embarrassment- when someone communicates with me, they don't know what I want to say, and I don't understand what they are trying to communicate...But later I found out that everyone is quite nice. So gradually I felt that I am more willing to talk to people and engage in activities, in the classroom and outside of the classroom.

Lastly, Christine, an undergraduate mentioned that the classmates don't ask questions made Christine feel that they should not ask questions in class. Christine explained,

When I was a freshman, I had more close connections with professors. Because when I first came to the United States, I didn't know much about anything, so I could only approach the professors to ask questions, and then I was in the junior and senior year of college. Then I saw my classmates, and they don't ask questions. Well, they have their own ideas...Probably because we are design majors. You should use your own ideas.

When asked about participants' general experience with classroom/academic engagement, focus-group participants indicated having good relationships with their professors, and faculty were especially accessible when students had questions with their coursework. These resulted in increased academic engagement for these Chinese international

students. Graduate students had higher levels of connections with some faculty, especially their supervisor. In addition, a student recognized their English barrier, but the perceived support increased their comfort to speak in English therefore engagement.

Relationship with Peers

Participants agreed that they sought relationships with other Chinese international students. Christine mentioned that she chose to form groups with other Chinese students for a class discussion/project.

There are always Chinese students in the classes I take. Then if we can form the groups by ourselves [for a class discussion/project], I just teamed with Chinese students, unless the professor divided the groups for us. If there are Chinese classmates in the class, we seldom communicate with other American classmates. When communicating with some American teammates [classmates], basically just small talk. I may follow them on social media, but I won't hang out with them [outside of class]. But with Chinese classmates, as long as there are Chinese students in this class, we will friend each other on WeChat immediately, by the end of the first class!

Even though some participants mentioned that they are the only Chinese students in their major or their class, they still sought out relationships with Chinese students outside of the classroom, or they quickly bonded with other Asian students in the class. For example, Abby said,

I am the only Chinese student in this major, so I must go to other students... Well, there is an American classmate. He's so outgoing so we became friends. I know a lot of people from other countries, the Japanese, and the Koreans. I think my relationship with my peers is relatively good. I knew a few Chinese students from the orientation, although they are not the same major as me, normally we just communicate more.

The participants provided explanations about why they seek national ties with other Chinese students, or why they did not form similarly close relationships with domestic, American, students. Blair mentioned the influence of the language barrier, “If you talk to other Chinese people, you will feel more connected, the communication is smoother, it's all in Chinese, it's easy to deal with jokes and so on. I get stuck with English”. Emma mentioned other factors including COVID and an age difference with her fellow classmates.

Originally, when I was in my first year, I felt that I connected well with many classmates. As a result of COVID, [classes] were all changed to online. After the second half of that spring semester [that changed to online], many students could not see each other or connect at all. This had a big impact on me...In all the classes I have taken, I am the only Chinese student. but most of my American classmates in my class are a lot older than me. Well, so that's how it is, most of them are in their forties, fifties, and even sixties. I still try to bond with my classmates, but people talk about children and spouses all the time. Then I can't join them. So, it's what it is...

In general, participants indicated when there were Chinese international students in the classroom, they sought out collaborations and relationships with them. They also cultivated relationships with domestic students, however, the pandemic and online education made this connection weak.

Extracurricular Activities. When asked about their engagement with extracurricular activities, participants mentioned activities organized by Global Education Office (GEO) or Chinese International Student and Scholar Association (CSSA) at the university. Two undergraduate students, Abby and Christine preferred participating in activities that were organized by CSSA, because Abby is a member of the student organization and Christine

thought these activities are more “relevant” to Chinese students. Compared to these cultural activities, the GEO organized events that supported students with practicing English and learning about American culture. Emma said,

I used to go to all the activities that GEO puts on, mostly during my first year before COVID. I wanted to make friends. I really wanted to meet more people, speak more English, and make more friends. That's the biggest motivation. One of my favorite programs was called “friend family”. GEO matched you to a local American family, and my host family happens to have a professor at my university. They were very nice people, and we've become friends and family. We support each other and have dinner together quite often. And I didn't have a car back then, so they drove me to buy groceries, took me to places and mailed things for me. So, I think that program is my favorite one. Because the relationship we developed is not a short-term one, it will last from now to the future.

Blair was very active in participating in extracurricular activities organized by GEO and CSSA, and provided several reasons to remain engaged,

A very important factor in participating in these activities is the free meal. In addition to free meals, you can also meet more friends, practice English. Yes. I basically have participated in all of GEO's activities. The conversational partner, I basically matched with all of them...I also think it is more helpful to me if I can open myself to different people's lives or communicate with different people. I am very curious, and I am also willing, as an international student, to help others.

Blair also participated in volunteer opportunities and activities organized by other student organizations like the Graduate Student Council (GSC). She didn't enjoy the GSC activity as

she said, “because most of them are American students, they already have their small cohort. I went alone, it’s hard to join them.”

Other participants also shared reasons when they sometimes chose not to participate in extracurricular activities. Abby mentioned the influence of peer pressure or conformity. “It’s a Thanksgiving event during the epidemic, it’s like, free food give-away. Anyway, I was looking at this event and I wanted to participate, but because my friends didn’t want to go, I didn’t go either”. Demi, a graduate student in Chemistry, explained that Chemistry experiments are very time consuming, and she can’t risk leaving the lab. Therefore, academic pressure was a reason that she did not participate in many extracurricular activities. Lastly, Emma added a reason that received everyone’s agreement (all the participants reacted with a “thumb up” on Zoom).

Emma said,

Let me add this, I think there is a point that many people may have. I didn’t have a car in my first year and even though I wanted to go to an event I couldn’t because there was no transportation. And there are some activities I choose not to go to when they are at night, I would worry about safety [on public transportations]. I think a lot of Chinese students have this concern too.

Conversation with participants about extracurricular activity engagement indicated Chinese international students mainly participated in GEO/ISO or CSSA organized events. Although English proficiency had no significant relationship with engagement in the quantitative model, focus-group participants suggested the relationship might be negative, as they would participate in activities to practice English.

Socializing

In terms of Chinese international students' socializing outside of the classroom, many of them bond with other Chinese international students because they can help with the acculturation. Blair clarified that, "Chinese friends [who came here before me] are more aware of the environment and we would hangout. Wherever I have time, they would take me to all kinds of things." In addition to Chinese friends, these students also socialize based on personal interests or experience. For example, Abby mentioned that her American friend would invite her to celebrate Thanksgiving with their family.

And then there's the one friend I mentioned earlier. The one who's very outgoing, they invited me to a New York trip, then on Thanksgiving, and they asked me if I wanted to go to their house to celebrate Thanksgiving. I thought it was pretty good, I could experience American culture, so I said yes, I went over to celebrate Thanksgiving with them. Well, I think most international students may have this sort of experience, they [Americans] are very hospitable during holidays.

Other than socializing with Chinese friends, Blair also makes friends via sports, "Because I was busy with studying, I sit all the time and I felt like exercising. I would ask my friends to go to the gym with me. Then I felt good about my health. Because if I go with my friends, I am happier, although my body is in pain".

Demi and Emma both mentioned that their spouse or partner introduced them to their friend groups. Demi said,

I have American friends, mainly through my wife. We are Star Wars fans, and the organization of Star Wars fans is called the 501st Legion. She got along very well with a family who also belong to the 501st Legion, and we would get together often. We can

go to their houses and there are lots of activities, I feel very happy to go there and relax.

Very pleasant!

Emma mentioned her boyfriend,

I have a boyfriend who is American, and I know a bunch of his friends. They often play board games, hangout together and so on. It was my boyfriend who led the way. I also went to his house to meet his family, so this is quite nice to me.

In general, participants bonded with other Chinese international students, but they also developed friendship with other students to celebrate holidays and based on personal interest.

Belongingness

When participants were asked about their belongingness at their university, they spoke about specific incidents or experiences that influenced their sense of belonging including peer support (an indicator of belongingness), institutional support, poor communication with faculty, and racism. For example, when asked about experiences that have helped them to feel belonged. Blair said,

The source of my belonging is from a senior Chinese student. She would take me to some activities. She would say to me “if you want to go to this event, I will pick you up”. During the car ride, she would introduce the event to me and introduce me to the professors there, and some of the classes the professors teach that I may take in the future. That’s when I feel like I belong to this place.

And when asked in ways they did not feel belonged. Emma shared her story of a home burglary and how she felt less belonged after the event considering the support she received from GEO.

I've just thought about when I felt that I least belonged. It's where I lived during my second semester. The house was burglarized, and I was the only one who lost everything in my room, because I happened to be away from home that day. It hit me hard at that time, the pandemic was already stressful, and I lost my money, credit cards, and the computer. So, I felt very sad at that time, that was the most insecure thing and it's unsafe, and at the same time I felt no sense of belonging. But hey, what can I do? I just hope they can accommodate/help me more. After the incident happened, the Dean of our school sent me an email to show condolences to me. That's nice of them.

However, when she wrote to GEO for help, she received a negative response that affected her belongingness further:

There is one other thing that really made me feel no sense of belonging at all! It is the GEO. They emailed me and asked me if I needed help, so I said, my home has been invaded and I am afraid to live here anymore. Could you help me find a place to stay for a few days? GEO wrote back to me, "why don't you go back to China", they were suggesting that I go back to China. That email was so hurtful. I was like, it would be fine if you don't help me... but... Their explanation is because of COVID, they can't put me in a school apartment. They don't want the virus to spread. Well, COVID could be the reason that they can't arrange for me to live on campus, but they just said "why don't you go back to China? Can you go back to China?" And I thought that was the time when China and the United States discouraged travel and flights, right? At that time, traveling was very discouraged, and tickets were very expensive, and they just told me to go back. Wow, I was really [shocked].

Safety issues were also brought up by Fiona, different than Emma who experienced home invasion, Fiona expressed concerns about safety because the experiences she had related to racism.

I want to say something about not having a sense of belonging. Uh, I was scared because of the Asian Hate. You went outside and this [racism] will happen to you. A random guy saw me on the street, and he started to speak Chinese, but he didn't speak Chinese at all! He's just tried to talk like that, and it makes me very scared. I met him a few times. I did think about moving away, the community wasn't very safe to me. I felt scared. At that time, the school had a gathering called Asian Voice and they held meetings. I attended several times online. I think that is a little helpful...But this feeling of not belonging, it seems that it has only been forgotten [hindered], but it still exists.

Fiona also shared her experience with racism was not isolated to COVID and shared other instances of experiencing racism prior to the pandemic.

Even before COVID, there was discrimination. Like when I go to a store, people can't understand what I'm talking about, and I can't understand them either. I think this is still quite difficult for me. It's less in the university because people understand oppression [discrimination]. But there are some stores, where they seldom saw Chinese faces and they don't know how to talk to you. COVID just made it worse, but that kind of discrimination existed all the time.

Blair mentioned the advisor for her doctoral program, which was also the advisor when they were in the master program in the same department, but the advisor did not tell Blair about leaving the job.

I am the only doctoral student in our program that year. My academic adviser was leaving, and they notified all the students that they were leaving. Everyone in the class knew, and all the students who they served as advisor knew about leaving. And they didn't tell me. I knew it from someone else. This made me feel that I didn't belong, a feeling that I didn't recognize, I was excluded and completely forgotten. Not feeling valued.

In terms of sense of belonging, participants had different experiences that influenced their belongingness at the university. In the measurement model, peer support and faculty support were the two indicators of belongingness. And focus-group participants shared peer support increased their belongingness, while poor communication with faculty left the student feeling less belonged and valued. Other focus-group participants shared that their perceived lack of support from ISS decreased their sense of belonging; racism negatively impacted their sense of belonging. These findings corresponded with quantitative findings in the model.

Summary of the Findings

Both engagement and belongingness CFA models and the group invariance models provided evidence of good construct validity to continue the SEM analyses. The finding between engagement and belongingness was consistent with previous literature, Chinese international students' belongingness positively predicted their engagement. Four factors, English proficiency, years in the U.S., ISS support and racism were included in the SEM model along with the measurement models. English proficiency positively predicted Chinese students' belongingness after controlling other predictors in the model. Although focus-group participants did not mention the direct influence of English proficiency on sense of belonging. They reported discrimination related to low language proficiency had negative impact on their

sense of belonging. The quantitative model indicated racism had a negative impact on students' belonging, and the conversation with focus-group participants confirmed this finding. Surprisingly, the direct relationship between racism and engagement was positive. One explanation might be a mediation effect of belongingness on racism and engagement after other predictors were controlled in the model. One participant in the focus group mentioned, when she experienced racism during COVID, she actively participated in support groups that were organized by the university. This could potentially explain why racism was associated with a higher level of engagement. However, this should not be treated as evidence to the positive relationship between racism and engagement found in the quantitative model. The focus-group findings also provided complementary information regarding some non-significant relationship in the model, and confirmation with previous literature. A more detailed discussion of the findings is included in Chapter V.

Chapter V: Discussion

This chapter presents the interpretation of the quantitative and qualitative findings and discusses them within the context of the existing literature. Then, implications for future research, theory development and college and university practice are discussed. The chapter concludes with a summary of the study, limitations, and directions for future research in the area of belonging and engagement among international student populations.

Discussion of Findings

Belongingness

This study broadly examined the relationship between Chinese international students' engagement and belongingness in U.S. universities. Strayhorn (2018) used several studies to describe the positive relationship between engagement and belongingness, however these studies did not support a causal relationship. The findings of the present study were consistent with Strayhorn's work and extended the literature to include the predictive relationships between students' belongingness and students' engagement over last academic year. The findings also contribute to research on Chinese international students' belongingness with quantitative data and a measurement (CFA) model that indicated five components of belongingness: general belongingness, university affiliation, peer support, faculty support and perceived classroom comfort.

The analytic approach used in this study contributed to further understanding of belongingness. Using the CFA model, it was possible to compare group invariance in belongingness. The results showed that students who were majoring in STEM fields reported significantly different belongingness response patterns compared to their peers in non-STEM majors. This finding is significant as it suggests that perceived belongingness is influenced by

a students' choice of a major, however this finding could not be explored in greater depth due to the limited explanatory power of the small sample size. However, related research may offer further insight. Wang and BrckaLorenz (2018) found faculty in STEM fields encouraged international students to collaborate with their peers to a greater extent than faculty in non-STEM fields. They also found that faculty's ethnic or racial background was associated with their level of care for international students. More specifically, Asian and Native Hawaiian or other Pacific Islander faculty and Black or African American faculty participated in more faculty-student interactions with international students. These faculty encouraged more collaborative learning activities for international students compared to their White colleagues. Similarly, these ideas were supported by focus group findings where, a Chinese student explained that faculty who have international background were more understanding towards her language barrier and encouraged the student's interaction with other students (ask questions).

Previous studies found that English language proficiency played a significant role in Chinese students' sense of belonging (Cao et al., 2017; Yao, 2014). Low language proficiency was a barrier to sense of belonging according to Yao's (2014) interviews with first-year Chinese international students. In this study, SEM analysis revealed that English proficiency was positively associated with the number of years a student had been in the U.S. and proficiency positively predicted Chinese international students' belongingness. The quantitative finding contributes to the literature by providing empirical evidence based on quantitative methodology about the importance of English mastery to belongingness. Although in this study's focus group, no participants spoke about the direct influence of English proficiency on their sense of belonging. A student mentioned perceived discrimination related

to language deficiency had decreased their belongingness towards the larger university community.

In addition, the results indicated that perceived racism is negatively associated with ISS (International Student and Scholar Office) support and negatively predicted students' sense of belonging. This is one of the first studies to examine perceived online and in-person racism relative to belongingness and engagement among Chinese international students. The qualitative finding also revealed that discrimination and safety issues related to racism, had a substantial negative impact on students' feelings of belongingness. Although the path from ISS support to belongingness was not significant in the model (approaching significance at $p=.07$), the significant negative association between ISS and racism could explain some of the indirect effects that ISS support had on belongingness. For example, a Chinese student in the focus group described when "Asian Hate" was on the rise during COVID, the emotional support she received from a group called Asian Voice on campus decreased the feeling of not belonging. In contrast, another student detailed her devastating experience with a home invasion, and the lack of empathy and support for a temporary stay from the university ISS contributed to a decreased sense of belonging. These findings also corresponded with existing literature which indicates experiences with racism poses a threat to international students' belongingness (Dovchin, 2020; Karuppan & Barari, 2011; Martirosyan et al., 2019; Mwangi, 2016).

The focus group findings also revealed that specific incidents that are significant to students heavily influenced their belongingness. For example, the home invasion and Asian Hate. One thing to note is that these effects on sense of belonging could be temporary as Strayhorn (2018) suggested belongingness needed to be considered within specific time. Another student discussed her feelings of belonging when a senior student involved her in

social events, and feelings of not belonging when her advisor, who has been with her since the Master Program, did not inform her they were leaving the university. These experiences correspond well with Strayhorn's (2018) College Student Sense of Belonging Model, in which Strayhorn emphasized that belongingness is related to mattering and being valued; it changes with circumstances and in certain situations the idea of belonging can take on heightened importance. Thus, universities should consistently support Chinese international students' positive experience and pay specific attention to incidents that could impact students' belongingness post COVID.

Engagement

In this study, the engagement measurement model consisted of three factors, classroom engagement, extracurricular activity, and socialization. Similar to belonging, this measurement model was tested for multi-group invariances, and the invariance was significant for extraversion. Toma's (2015) study indicated that extraverted college students engage differently compared with their more introverted peers. Interestingly during the focus group, an undergraduate student was not more engaged because of their own extraversion, they indicated that an extraverted American friend invited them to many academic and social activities, and the interaction with others migrated the effect of extraversion on engagement.

Through the SEM analysis, there was a significant positive effect of racism on engagement after controlling for other predictors. As mentioned, this could be contributed by the mediation role belongingness played in the model. This finding could suggest that greater levels of belongingness can mediate the negative effect of racism on engagement. Indeed, Karuppan and Barari (2011) found that perceived discrimination negatively affected international student engagement. Further, in this study, even though focus-group participants

described seeking out support groups when they encountered racism, this preliminary finding should not be treated as the evidence of a positive relationship between racism and engagement. The focus group did not provide evidence supporting the relationship indicating low racism and low engagement. This finding should be interpreted with the specific university context and is an area that requires further study to examine how university responses to racism, such as programming and student supports, may contribute to increased engagement.

Karuppan and Barari (2011) also indicated that English proficiency had a strong, positive impact on active and collaborative learning (one indicator of engagement in NSSE). However, this study's qualitative data provided evidence that students with limited English proficiency had higher student engagement. A Chinese student in the focus group was very concerned with her English mastery. Rather than engaging less in college life, as the only Chinese student in her program, she actively interacted with faculty and domestic peers; participated in almost all extracurricular activities she had access to, especially with the university ISS's conversational partners program. This Chinese student engaged actively to practice English, meet people and have meaningful overseas experience. Cho (2013) also found similar results when interviewing three Korean college students in the U.S., where they described actively participated in churches to practice English. However, it is important to note that this finding did not imply a negative relationship between English proficiency and Engagement. Students with low English proficiency engage in more language activities, but how students with adequate English proficiency engage remains unknown and requires future research.

The participants in the focus group interview all revealed that faculty are supportive, but they didn't feel connected with faculty after the course completion. In general, graduate

students had more close relationships with faculty because they had other curricular activities (research) to do with certain faculty members. This is partially consistent with Zhao et al. (2015)'s finding, they indicated that first year international students had higher levels of student- faculty interaction compared to their domestic peers.

In terms of peer relationship, it was not surprising that all participants in the focus group sought co-national ties, they tended to connect with Chinese international students in the classroom and for socialization. This finding also corresponded with previous research findings that international students have a tendency to interact and socialize with students who have similar cultural backgrounds (Cao et al., 2017; McFaul, 2016; T. Toyokawa & N. Toyokawa, 2002). In the focus group, Chinese students described their interaction with domestic students, many of them also developed positive relationships with their domestic peers, however, COVID shifted classroom instruction and other programs to an online environment, many focus group participants indicated they lost the connections with their peers. The research on the impact of COVID on international student engagement has been very limited, research conducted on general college students indicated that the transition from learning in classrooms to online environment had negative impact on student engagement (Perets et al., 2020), and student interaction with faculty, peers and materials had been significantly decreased (Castro and George, 2021).

Implications

Implication for Research and Theory

This exploratory research study combined quantitative and qualitative results to provide empirical evidence about Chinese international students' engagement belongingness at US universities and colleges. This research represents a first step to raise awareness for this

marginalized group of students during political and social unrest and provide evidence-based support systems to them.

The study findings are closely related to Astin's (1984) Theory of Student Involvement and Strayhorn's (2018) Model of College Students' Belonging. Both of these theoretical models could be extended to Chinese international students. For example, Astin (1984) asserted that the effectiveness of institutional policies, practices and support determined the capacity of student involvement. Although the paths from ISS to engagement and belongingness were not significant in the SEM, ISS was significantly negatively associated with racism. In addition, ISS assisted Chinese students to increase interactions with their peers, build connections within the community and practice English.

Strayhorn (2018) argued that belongingness should be considered within specific context and population. During COVID, racism towards Asian people dramatically increased (Ziem et al., 2020). According to the SEM results, the indirect path from racism to engagement (racism->belongingness, belongingness->engagement) were all statistically significant. Racism negatively predicted belongingness and belongingness positively predicted engagement. A student in the focus group stated she felt like she didn't belong because of Asian Hate, however her feelings of belongingness were positively influenced through participation in related events like Asian Voice and this study to satisfy her need to belong and help her increase a sense of belonging.

Many of the present study's findings are consistent with previous literature. For example, extraversion was associated with different engagement levels and patterns (Toma, 2015); English proficiency had a substantial influence on Chinese international students' experience (e.g., Cao et al. 2017; Karuppan and Barari, 2011; Nieto and Zoller Booth, 2010; T.

Toyokawa & N. Toyokawa, 2002; Yao, 2014), some students reported active engagement in various activities as motivation to practice English (Cho, 2013); Chinese international students tended to develop co-national relationships (Cao et al., 2017; Ross and Chen, 2015), and this relationship increased their perceived classroom comfort and sense of belonging. This study also offers a methodological contribution to the literature by providing a reliable measurement of Chinese students' belonging, engagement, and post-secondary experiences. However, like many studies, the findings are limited by the methodology and design which will be discussed in the limitation section along with directions for future studies.

Implications for College and University Practitioners

This study has the potential to inform and improve the support system to enhance the college experience for international students. International students clearly face a number of challenges that can compromise their engagement and sense of belonging in U.S. universities. Understanding their current situation and factors that influence their experience is essential for staff and faculty to better address international students' needs and help make their experience more meaningful and enjoyable. In the literature review, factors were introduced in Bronfenbrenner's (1994) Ecological System Theory to recognize the multiple layers of influence; this study's findings have implication of the different system levels in an ecological system, the following discussion is organized accordingly.

Individual Level. Factors on the individual level such as extraversion, years in the U.S., had been repeatedly reported to have significant influence on international students' engagement and belongingness. Although the implications based on these findings are limited for practitioners. This study found that years in the U.S. were positively associated with English proficiency. Universities should take heightened attention to first-year international

students' language proficiency when developing language programs. In addition, these significant factors should be controlled in quantitative models in the future to produce accurate results.

Microsystem. Bronfenbrenner described a microsystem as “the immediate environment” the individual has (Bronfenbrenner, 1994). Factors in the microsystem directly associated with the university- the “immediate environment” for Chinese international students.

The Role of ISS. The International Student and Scholar Office is the primary contact international students have on campus and offers the support they may need. As mentioned earlier, many ISS have programs in place that help international students with language and acculturation. They have professional advisors that handle students' legal and travel documents. However, these programs may be developed based on general guidance, but evidence regarding whether these programs have supported international students effectively or not are neglected. Thus, an evaluation system should be developed to support international students with different needs, especially during different times.

ISS can also better assist international students by creating a sense of community and increasing meaningful interaction between students. According to the focus group results, a Chinese international student reported feeling a higher sense of belonging when a senior Chinese student involved her in different activities and drove her to places when she needed. The role this senior Chinese student played as a “model” with a similar cultural background could greatly help other international students with acculturation in many aspects. The “model” experienced a similar acculturation process and could provide guidance to incoming and new international students. A “hand-in-hand” or a mentor program could be established to introduce

students from similar cultural/countries. In addition, senior international students can be valuable resources for universities and college programs. For example, they could help write handbooks for incoming or new international students. ISS should also create activities or events that attract general students to participate in order to support socialization with domestic students outside of the classroom.

The Role of Faculty and Staff. Another important finding in this study highlights the importance of involving faculty members and advisors in supporting Chinese international students' engagement and belongingness. Accordingly, many Chinese international students benefit from student-faculty interaction in class. Faculty should create groups that include both international students and domestic students to better engage international students in class and encourage interactions between domestic and international students.

Many Chinese international graduate students reported that they wanted a similar level of interaction with faculty compared to domestic students outside of the class. Students could also benefit from interactions with other staff, especially with academic advisors as both students in this study reported very low interaction with them. The results also indicated that faculty with international background had a better understanding of students' struggles in class. Based on these findings, it is crucial to raise the faculty and staff's cultural awareness and appropriate training should be received by university employees to better support international students.

Macrosystem. The influence of the factors in the Macrosystem on international students' experience include all patterns in other systems. For example, language proficiency requires a collaborative effort among individual students, faculty and ISS.

Language. According to the study findings, English language proficiency plays a significant role in Chinese international students' everyday life and positively impacts their engagement experience and sense of belonging in U.S. universities. Students may have trouble understanding material in class and find it difficult to interact with domestic students and faculty.

Many universities have programs in place to help international students with language; however, solely having the programs in place is not sufficient. It is important to evaluate these programs with students' needs and outcomes. For example, during the focus group, a student mentioned that in the language groups that were supposed to practice English and increase communication between domestic students and international students, only international students participated. This may inadvertently contribute to limited socializing with only people from culturally similar groups and contradict students' expectations or goals of such experiences. Thus, hiring or inviting native speakers to facilitate conversational groups can help international students' transition to both culture and language. In addition, academic writing in English may take longer for international students to learn and use, thus appropriate support from writing centers and ISS should be provided to the students, for example, topics include "how to write appropriate E-mails to professors" and "the general formatting of a paper/essay assignment" could be beneficial.

Racism. It is important that the university create an inclusive and diverse environment to not only to support traditional students, but also minority groups of students like Chinese international students. Coming from another culture and a different social structure, Chinese international students lack fundamental knowledge about racism and discrimination in the U.S. Creating an open space for international students to communicate their experiences and share

information in an important step in helping students to begin to resolve negative experiences. Formal education about racism should take place for incoming students and continuous support should be offered by university counseling services in students' native language. If services in Mandarin Chinese are not available on campus, a referral should be made to students with available services off campus.

Limitation and Future Research

There are several limitations that constrain the study findings. The first is the relatively small number of survey participants and resulting sample size for quantitative analyses. There has been debate as to sample size requirements for conducting Structural Equation Modeling (SEM) including Confirmatory Factor Analysis (CFA). The general rule is a minimum sample of 100, preferably 200; other studies suggest p:f (item per factor) as the main consideration (Bollen, 1989; Boomsma, 1982; DiStefano & Hess, 2005; Kline, 2005; Marsh et al., 1998). Marsh et al. (1998) posited that many indicators per factor compensate to some extent for a small sample size. In one of their studies, they concluded when p:f is 3, N=100 may be sufficient, 200 is preferable, however, when p:f=6 or 12, N=50 is sufficient (Marsh et al., 1998). Specific to this study, the CFA models were divided into two single factor models (Engagement and Belongingness) instead of one CFA model with two latent variables. In addition, when measuring model invariance, it is likely underpowered since some groups have extremely small numbers. Thus, the invariance testing was not continued. To increase the power of the design while mitigating the limitations of the small sample size, a follow-up focus group was conducted to supplement the quantitative findings and add a design component. The qualitative data collection provided further data to address the research questions and offered explanations for the quantitative results more fully. Thus, although the sample size in the study

is limited, this study did provide a snapshot of Chinese international student engagement and sense of belonging informed by existing literature.

In the literature review, it was stated that international student density might be a factor that influences Chinese international students' experience (Cao et al., 2017; Zhao et al., 2005). And this study intentionally reached out to different universities in order to conduct multilevel modeling to account for the different international student densities. Also, the quality of the service in relation to student satisfaction with ISS programs/supports can vary from universities. However, many ISS(s) and CSSA(s) don't disseminate research for students/outside researchers. In the future, it is important to seek collaboration with faculty or organizations within different universities or it will be hard to include the factors in the investigation.

Several limitations related to study design including convenience data collection, self-reported bias, the influence of COVID and the cross-sectional design. It is important to note that the "feedback loop" effect between engagement and belongingness was not addressed in this study, there are many problems and technical difficulties in statistical software when it comes to estimate models with feedback loops unless the start value is accurate. This is noted by many methodologists that SEM computer programs often do not yield a converged solution when direct effects of a feedback loop and disturbances of variances and covariances of endogenous variables were involved (Hancock and Mueller, 2006; Kenny, 1979; Kline, 2004). Future research should make sure that the start value is accurate (modify SEM model start value in computer programs) and associate disturbances (Hancock and Mueller, 2006). In addition, a longitudinal design specifically cross-lagged panel model is recommended for

future studies if feedback loops are involved. By doing so, researchers can develop a better understanding of relationship between engagement and belongingness over time.

In terms of limitation with measurement, co-curricular activities were excluded in the engagement CFA model because of low factor loading. These items were adopted from NSSE without modification, the response scale for this set of items (do not plan to do, plan to do, done or in progress) are limited in nature to be treated as continuous variables. Thus, future studies should develop new scales to measure co-curricular activities and re-introduce the engagement measurement model.

After data was collected, item attrition was noticed in the pattern of responses. It may be more fruitful to require answers on every item and prevent participants from skipping questions, however this approach may introduce some ethical concerns. For all items, response options of “N/A” and “I choose to not answer” should be included. In addition, researchers can consider administering the survey in Mandarin Chinese as an option to increase response rate.

A focus group was conducted with Chinese international students in one university to supplement the quantitative results of this study. The findings are limited because both undergraduates and graduates were included in the same focus group session. Undergraduate and graduate experiences were different especially in terms of their interaction with faculty and peers. Future research should include multiple focus groups and attend to different factors that may influence Chinese students' belonging and engagement such as if they are enrolled in undergraduate or graduate programs and if they live on campus or commute.

In addition, this study focused on Chinese international students, but questions remain for other international students and minority students in the U.S. universities, including LGBTQ students and students from low-income families. This study highlights the need for

research on marginalized students and suggests universities provide programs to support student success, especially for those in need.

Lastly, this study focused on exploring the relationship between international student engagement and belongingness in universities but did not include any long-term outcome such as mental health, thriving and wellbeing. It's reasonable to explore these outcomes in future studies and provide a more holistic view of student overseas experience.

Conclusion

Chinese international students are a growing population in the U.S. universities and their experiences have not been studied sufficiently in order to inform university practice. The purpose of this study was to provide a snapshot of Chinese international students' engagement and belongingness by focusing on these students only. Survey items were adapted based on their experience and the literature; a follow-up focus group was conducted in Mandarin Chinese to ensure they can voice their concerns and feelings without experiencing language barriers. The results of the study show that English language proficiency and experiences with racism can negatively impact Chinese international students' engagement. Students' sense of belonging may have buffered the negative effect of racism on student engagement. The findings also confirmed that the theoretical and measurement framework used to measure engagement and sense of belonging were accurate models for Chinese international students. An especially significant contribution of this study is the development and preliminary validation of a survey instrument specifically designed to measure international students' engagement and belongingness. Future research should explore the implementation, quality and efficacy of university programs and policies to further the body of evidence-based practices on how to better support Chinese international students.

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Appendix A

Survey Items and Originality

Pre-screening Question:

Do you identify yourself as a *Chinese International Student* who is at least 18 years old?

Chinese international students were defined as individuals who were Chinese nationals and came to the U.S. to pursue higher education. These may include holders of F (student) visas, H (temporary worker/trainee) visas, J (temporary educational exchange visitor) visas, and M (vocational training) visas. If you identify yourself as Immigrants, refugees and who participate in short-term educational programs (e.g., language, volunteer programs), please do not proceed.

Yes (proceed)

No (quit)

Variable Types	Variables	Item Type ¹	Source: Original Scales/Example Items/Other References	Items Used/Developed for instrumentation in this study
Demographic Variables	Gender	Constructed	N/A	To which gender identity do you most identify? <i>1=Female, 2=Male, 3=Nonbinary 0=Prefer Not to Answer</i>
	University	Constructed	N/A	What is your university?
	Major (STEM VS. Non-STEM)	Constructed	N/A	What is your major?
	Email Address	Constructed	N/A	Please provide your email address if you wish to participate in the gift card drawing. Your email address will be removed and will not be linked to your survey responses.
	Extraversion	Adopted	Mini International Personality Item Pool (Mini IPIP) (Donnellan et al., 2006)	<i>Indicate for each statement whether it is 1. Very Inaccurate, 2. Moderately Inaccurate, 3. Neither Accurate Nor Inaccurate, 4. Moderately Accurate, or 5. Very Accurate as a description of you.</i> Am the life of the party Don't talk a lot. (R) Talk to a lot of different people at parties. Keep in the background. (R)
Degree (Graduate VS. Undergraduate)	Constructed	N/A	I am a graduate student. I am an undergraduate student. Other	

1. Constructed- Items were developed based on existing literature; Adopted- Items were taken from original scales; Adapted- Items were significantly altered based on literature.

Variable Types	Variables	Originality	Original Scales/Example Items/Other References	Items in THIS study
Predictors	Language proficiency	Constructed	N/A These items are constructed based on Test of English as a Foreign Language (TOEFL) Score Interpretation	How would you rate your English Reading/Writing/Listening/Speaking Skill? <i>1=Below basic, 2=Basic, 3=Low-Intermediate, 4= High-Intermediate, 5=Advanced</i>
	Time in the U.S.	Constructed	N/A	How many years have you been studying in the U.S.?
	ISS Support	Constructed	N/A These items are constructed based on: Marginson, S. (2012) International Student Security. Deardorff, D. K., de Wit, H., Heyl, J. D., & Adams, T. (Eds.), <i>The SAGE handbook of international higher education</i> . (pp. 207-221). Sage. Rhodes, G., & Ludeman. R. (2012) Legal, Health and Safety Issues. Deardorff, D. K., de Wit, H., Heyl, J. D., & Adams, T. (Eds.), <i>The SAGE handbook of international higher education</i> . (pp. 223-241). Sage.	Indicate the quality of the following types of programs provided by the International Student Office at your institution. <i>0= Not Applicable</i> <i>1= Very dissatisfied, 2= Dissatisfied, 3= Neutral, 4= Satisfied, and 5= Very Satisfied</i> a. Language Proficiency (e.g. Conversational Partners, Conversational hours, Writing Centers) b. Academic Support (e.g. Academic Orientation, Advising) c. Social/Cultural Support (e.g. Housing, Traditional Festival Celebration, Sightseeing) d. Finance/Work (e.g. Job search, OPT, Tax) e. Travel (e.g. Travel legal documents) f. Health (e.g. insurance) How satisfied are you with your interaction(s) with International Student Office staff and your unoveristy? <i>0= Not Applicable</i> <i>1= Very dissatisfied, 2= Dissatisfied, 3= Neutral, 4= Satisfied, and 5= Very Satisfied</i>
Perceived Racism			Items adopted from: Cheah, C. S., Wang, C., Ren, H., Zong, X., Cho, H. S., & Xue, X. (2020). COVID-19 racism and mental health in Chinese American families. <i>Pediatrics</i> , 146(5). e.g. Due to COVID-19, people have said mean or rude things about	If you have had any of the following types of experiences during the COVID 19 pandemic, please indicate the frequency of each incident. Online: Due to COVID-19, 1. People have said things that were untrue about Chinese people online. 2. People have said mean or rude things about me online because I am Chinese. 3. I have witnessed people saying mean or rude things about another Chinese person online. In-person:

		<p>Adapted</p>	<p>me because of my race or ethnic group online (parent: $\alpha = .91$; youth: $\alpha = .85$);</p> <p>Some people were unfriendly or unwelcoming toward me because of my Chinese background (parent: $\alpha = .95$; youth: $\alpha = .84$)</p> <p>*Cheah et al. (2020) studied Chinese American parents and adolescents perceived online and in-person racism during COVID-19. Their measures were adapted from several sources including: Online Victimization Scale for Adolescents (Tynes et al., 2010); Microaggressions Scale (Nadal, 2011) and Asian American Racism-Related Stress Inventory (Miller et al., 2012).</p>	<p>Due to COVID-19,</p> <ol style="list-style-type: none"> 1. People said things that were untrue about Chinese people. 2. People said negative things about Chinese people. 3. People were unfriendly or unwelcoming toward me because of my Chinese background <p><i>0= Not Applicable</i> <i>1=Always, 2=Very Often, 3=Sometimes, 4=Rarely, 5=Never</i></p>
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Engagement:

Variables	Originality	Original Scales/Example Items/Other References	Items in THIS study
Classroom Engagement	Adapted and constructed	<p>NSSE items: -During the current school year, about how often have you done the following? <i>Very often, Often, Sometimes, Never</i></p> <p>Asked questions or contributed to course discussions in other ways Asked another student to help you understand course material Explained course material to one or more students</p> <p>Astin’s theory of involvement informed the items intended to measure future engagement. Astin stated it is important to measure engagement physically and psychologically. The NSSE items are designed to measure engagement physically by asking the frequency of participants involvement in each activity, and I intend to measure engagement psychologically by asking the participants about their future effort they plan to invest in each activity.</p> <p>Items related to interaction with Chinese and other students constructed based on NSSE, Cao et al. (2017), Yao (2014) and Zhao et al. (2015).</p> <p>NSSE item: -During the current school year, about how often have you had discussions with people from the following groups?</p> <p>People of a race or ethnicity other than your own People from an economic background other than your own People with religious beliefs other than your own People with political views other than your own People with a sexual orientation other than your own People from a country other than your own</p>	<ol style="list-style-type: none"> 1. During the current school year, about how often have you done the following in the classroom? <i>N/A Never Rarely Sometimes Often Very often</i> <ol style="list-style-type: none"> a. Asked questions b. Contributed to course discussions c. Asked another student for help d. helped another student e. Discussed course materials with an instructor 2. How often do you plan on engaging in these activities in the classroom in the future? <i>N/A Never Rarely Sometimes Often Very often</i> <ol style="list-style-type: none"> a. Asking questions b. Contributing to course discussions c. Asking another student for help d. helping other student(s) e. Discussing course materials with an instructor 3. During the current school year, about how often have you had interactions with Chinese international students in the classroom? <i>N/A Never Rarely Sometimes Often Very often</i> 4. How often will you seek interactions with Chinese international students in the classroom in the future? <i>N/A Never Rarely Sometimes Often Very often</i> 5. During the current school year, about how often have you had interactions with students other than Chinese international students in the classroom? <i>N/A Never Rarely Sometimes Often Very often</i> 6. How often will you seek interactions with students other than Chinese international students in the classroom in the future? <i>N/A Never Rarely Sometimes Often Very often</i>
Co-curricular Activities Engagement	Adapted	<p>Co-curricular activities are adapted from NSSE and selected based on Bartkus et al. (2012).</p> <p>Bartkus et al. (2012) Co-curricular activity is complementary to the curriculum, each program and university may have different recommendations or requirements.</p> <p>NSSE item:</p>	<ol style="list-style-type: none"> 7. Which of the following have you done while in college or do you plan to do before you graduate? <i>N/A Do not plan to do, Plan to do, Done or in progress, Have not decided</i> <ol style="list-style-type: none"> a. Study and participate in other academic activities outside of class b. Discuss activities other than coursework with a faculty member Participating in an internship, co-op, field experience, student teaching, or labs

		<p>Which of the following have you done while in college or do you plan to do before you graduate? <i>Done or in progress, Plan to do, Do not plan to do, Have not decided</i></p> <p>Participate in an internship, co-op, field experience, student teaching, or clinical placement</p> <p>Hold a formal leadership role in a student organization or group (included as extra-curricular)</p> <p>Participate in a learning community or some other formal program where groups of students take two or more classes together</p> <p>Participate in a study abroad program</p> <p>Work with a faculty member on a research project</p> <p>Complete a culminating senior experience (capstone course, senior project or thesis, portfolio, recital, comprehensive exam, etc.)</p>	<p>c. Completing a culminating senior experience (capstone course, senior project or thesis, portfolio, recital, comprehensive exam, etc.)</p>
Extracurricular Activities Engagement	Constructed	<p>Items designed to measure extra-curricular activities were created based on Bartkus et al. (2012), International Student Office Websites, Rubin et al. (2002) and Eccles et al. (2003)</p>	<p>1 During the current school year, about how often have you participated in the following activities organized by the university or local community groups? <i>N/A Never Rarely Sometimes Often Very often</i></p> <ul style="list-style-type: none"> a. Cultural events b. Spiritual or religious activities c. Trips or tours d. Physical exercise or on a recreational sports team e. International student organizations f. Other student organizations g. English language practicing programs/groups h. Other activities organized by your university and local community groups <p>2 How often do you plan on participating in these activities organized by the university or local groups <i>in the future</i>? <i>N/A Never Rarely Sometimes Often Very often</i></p> <ul style="list-style-type: none"> a. Cultural events b. Spiritual or religious activities c. Trips or tours d. Physical exercise or on recreational sports teams e. International student organizations f. Other student organizations g. English language practicing programs/groups h. Other activities organized by your university and local community groups
Socializing	Constructed	<p>Items are created based on Cao et al. (2017) who indicated international students prefer to hang out with their co-nationals.</p>	<p>8. How often have you socialized with Chinese international students outside of the classroom? <i>N/A Never Rarely Sometimes Often Very often</i></p>

			<p>9. How often do you plan to socialize with Chinese international students outside of the classroom <i>in the future?</i> <i>N/A Never Rarely Sometimes Often Very often</i></p> <p>10. How often have you socialized with students <i>other than</i> Chinese international students? <i>N/A Never Rarely Sometimes Often Very often</i></p> <p>11. How often do you plan to socialize with students <i>other than</i> Chinese international students? <i>N/A Never Rarely Sometimes Often Very often</i></p> <p>12. How often do you socialize with members from your local community (e.g. local churches)? <i>N/A Never Rarely Sometimes Often Very often</i></p> <p>13. How often do you plan to socialize with members from your local community <i>in the future</i> (e.g. local churches)? <i>N/A Never Rarely Sometimes Often Very often</i></p>
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Belongingness

Based on your current experience at XXX, indicate how you feel about each item below using the following response options [*N/A =0, Strongly disagree, Slightly Disagree, Disagree, Neither Agree or Disagree, Slightly Agree, Agree, Strongly Agree.*]

General Belongingness Scale (GBS)	Adopted Malone et al. (2012)	Acceptance/Inclusion: 1. When I am with other people, I feel included 2. I feel accepted by others 3. I have a sense of belonging 4. I have a place at the table with others 5. I feel connected with others 6. I have close bonds with friends Rejection/Exclusion: 7. I feel like an outsider 8. I feel as if people do not care about me 9. Because I do not belong, I feel distant during the holiday season 10. I feel isolated from the rest of the world 11. When I am with other people, I feel like a stranger 12. Friends do not involve me in their plans
University affiliation	Adopted Unpublished university-wide student survey Sense of Belonging -fit and pride subscale (alpha= 0.84) (this information wasn't included in dissertation paper)	13. I tend to associate myself with my university. 14. When I meet someone for the first time off-campus, I would like to talk about my university. 15. I am glad I attend my university.
Perceived peer support	Adopted Sense of Belonging scale by Hoffman et al. (2002)	16. I am treated with as much respect as other students. 17. I have developed personal relationships with other students in the class. 18. If I miss class, I know students who I could get the notes from.
Perceived faculty support	Adopted Sense of Belonging scale by Hoffman et al. (2002)	22. I feel comfortable seeking help from a faculty member outside of class time (office hours etc.) 23. I feel that a faculty member would be sensitive to my difficulties if I shared them. 24. I feel that a faculty member would make extra effort to help me if I needed it.
Perceived classroom comfort	Adopted Sense of Belonging scale by Hoffman et al. (2002)	19. I feel comfortable contributing to class discussions. 20. I feel comfortable asking a question in class 21. I find it easy to join study groups with other students if I wanted to

Appendix B

Email to ISS for Survey Recruitment

Hello!

My name is Yingying Jiang, and I was an international student at xxx University from 20xx-20xx. I am currently a doctoral student at xxx and conducting a research study investigating student engagement and belongingness, especially with Chinese international students.

xxx is one of the top universities and has the largest international student enrollment. And right now, xxx has xxx undergraduate and graduate Chinese international students, which comprise approximately xxx of the total international student population. During my time at xxx, I was supported educationally, socially, and culturally. I eventually adjusted to a different culture, connected with diverse people around me, and started to commit to and become more fully integrated into xxx.

I hope to obtain IRB approval by early February, and I want to email to find out the possibility of conducting this research at xxx. And potentially an email invitation from the International Student Office to xxx Chinese international students about my research and the recruitment. It will be an online survey and should take about 20 minutes.

Thank you for your time! Please let me know if you have any questions.

Sincerely,

XXX

Appendix C

Social Media Post for Survey Recruitment

大家好，我在针对中国留学生对美国大学的参与度和归属感进行学术研究，目的是帮助美国大学更好的了解中国留学生的需求和现状，给予资源和帮助，使得中国留学生可以得到更加积极的留学体验！请点击此链接完成一个大约 20 分钟的问卷调查 <https://cisbae.questionpro.com> 完成后可加入 5 个\$20 礼品卡的抽奖。如果你有任何问题，请联系我。我的邮箱是.....谢谢支持！

Hello! I am conducting academic research on the engagement and sense of belonging of Chinese students in U.S. universities. The purpose of the research is to help universities better understand the needs and lived experience of Chinese international students and provide resources and support so that Chinese students can get more fruitful experiences! Please enter the survey by clicking this link, and it will take you approximately 20 minutes. <https://cisbae.questionpro.com> Completion of the survey will be incentivized by entering a raffle to win five \$20 gift cards. Thank you for your interest. I can be reached at xxx if you have any questions and concerns. Thanks!

Appendix D

Email from ISS to Chinese International Students for Survey Recruitment

Hello,

A doctoral student at xxx is conducting research on the engagement and sense of belonging of Chinese students in U.S. universities and would like to invite Chinese international students to participate!

Study Description: The purpose of the research is to help universities better understand the needs and lived experience of Chinese international students and provide resources and support so that Chinese students can get more fruitful experiences. The survey will take you approximately 20-30 minutes to complete. Completion of the survey will be incentivized by entering a raffle to win five \$20 gift cards. Your participation in this research survey is completely voluntary, and not participating will in no way affect your relationship with this organization and university.

Thank you for your interest. Please enter through [\(link\)](#).

She can be reached at xxx if you have any questions and concerns. Thanks!

Appendix E

Information Sheet for Survey Data Collection

PURPOSE OF THE STUDY

The primary purpose of this research study is to explore student engagement and belongingness, specifically with Chinese international students in the U.S. According to the 2020 Open Doors Report on International Educational Exchange, for the tenth year, China is the largest source of international students in the United States, with 372,532 students enrolled in academic programs. However, even though many Chinese international students live and study in the U.S., very little research has been conducted on their college experiences. In particular, there is a limited amount of research exploring whether or not Chinese international students are engaging effectively with their college or university environments or perceive a sense of belonging in their school setting. The results will inform institutional strategies to cultivate positive and fruitful experiences to promote engagement and belongingness.

PARTICIPATION

Participants need to be Chinese international students at least 18-year-old. For this study, Chinese international students were defined as individuals who were Chinese nationals and came to the U.S. to pursue higher education. These may include holders of F (student) visas, H (temporary worker/trainee) visas, J (temporary educational exchange-visitor) visas, and M (vocational training) visas. If you identify yourself as Immigrants, refugees and who participate in short-term educational programs (e.g., language, volunteer programs), please do not proceed.

You will be asked to complete a survey if you agree to participate in this study, and it should take about 20-30 minutes to complete. Please find a time and location that you will be comfortable answering the survey. Upon completion of the survey, you will be directed to separate page where you can enter your email address to be able to enter a drawing to win one of five \$20 Amazon gift cards.

RISKS AND CONFIDENTIALITY

Several procedures have been put in place to protect participants' anonymity and confidentiality. This survey does not collect any identifier information. All data collected is for research purpose only. In addition, only the researchers have access to the data, and all the data will be securely stored on the researcher's password-protected laptop.

WITHDRAWAL

Participation is solely voluntary, and confidentiality will be ensured. Participants will have the chance to quit at any stage of completing the survey.

CONTACT

If you have any questions, complaints, or concerns about your participation in this research, please contact:

Yingying Jiang
Doctoral Student
School of Education, xxx

Appendix F

Focus-group Interview Protocol

Example questions

1. 你能告诉小组你想使用的名字、你的专业学位以及你在 xxx 学习的内容吗？
- 例如，我叫艾伦，我是经济学专业的大四学生。

Can you tell the group your preferred pseudonym, your degree of program and what are you studying at xxx?

- For example, my name is Ellen, I am a senior major in Economics.

TOPIC 1 Engagement

2. 请描述您在 xxx 的学术参与或者经历？

或者

描述您与教职员工的关系和经历。

- a. 你和你的导师关系如何？

- i. 你会课后问问题吗？

描述你与其他的中国留学生和其他学生在课上的关系和经历

- b. 你在课上的经历是什么样的？与其他学生和其他中国留学生的交流是什么样的？

Describe how your academic engagement or experience has been so far at xxx?

Probe:

Describe your experiences with the faculty and staff in your program.

- a. How has your experience been with your instructors? Have you gone to office hours?

Describe your experiences with peers on campus and in the classroom.

- a. How are your classes going? What are your interactions with Chinese international students and other students like in the classroom?

3. 你今年参加学校组织的课外活动了吗？比如，文化活动，宗教活动，学生会？

- a. 这些活动怎么样？你喜欢吗？是什么让你喜欢或者不喜欢？

- b. 不参加是因为什么的？

In current school year, what kinds of extra-curricular activities (organized by xxx) have you participated in? For example, Cultural events, Spiritual or religious activities, student organizations.

- a. How were these events? Did you enjoy them or not? What made them enjoyable or unenjoyable?

- b. What are some reasons that you don't participate in such activities?

4. 请描述一下其他的社交活动？

- a. 跟中国留学生的互动和社交

- b. 跟其他学生，其余社会人士的社交

What are some other social activities you have participated in?

c. interaction with Chinese international students outside of the classroom.

d. interaction with other students or other people outside of the classroom.

TOPIC 2. Sense of Belonging

4. 您觉得自己融入 xxx 社区的程度如何？

5. 哪些经历让你有归属感？

6. 你在那些时候没有归属感？

7. xxx 怎么样可以加强你的归属感的？

How well do you feel your sense of belong to XXX community?

What experiences have helped you to feel belonged?

In way ways you do not feel belonged.

If you could suggest something to the XXX administration to assist Chinese international students increase their sense of belonging, what would you suggest?

TOPIC 3. Factors

6. 有什么其他的个人/学校/社会因素影响或者鼓励你对于学校课上参与度吗？

7. 有什么其他的个人/学校/社会因素影响或者鼓励你对于学校课外活动参与度吗？

8. 有什么其他的个人/学校/社会因素影响或者鼓励你对于社交活动参与度吗？

9. 有什么其他的个人/学校/社会因素影响或者鼓励你对于学校的归属感和融入感吗？

比如说,

英语, COVID, 家庭, 学业压力, 社会文化...

What are some other reasons that encourage or discourage you from classroom /extracurricular/social engagement and feeling belonged?

Probe:

- language, COVID, family, academic stress, social-cultural...

Appendix G

Email to ISS for Interview Recruitment

Hello!

I wanted to thank you for helping me recruit Chinese international students for my engagement and belongingness study in March! I couldn't have successfully collected my survey data without your help. However, the number of responses I get is less sufficient to conduct the advanced statistically techniques. To ensure my study's power and limit concerns around the small sample size, I am conducting a follow-up focus group interview to confirm previous survey findings and answer additional questions. The IRB amendment has been submitted and approved.

I am emailing again to find out the possibility of another email invitation from GEO to xxx Chinese international students about my follow-up research and the recruitment. Please see the drafted invitation email attached.

Thank you for your time! Please let me know if you have any questions.

Sincerely,
XXX

Appendix H

Email from ISS to Chinese International Students for Interview Recruitment

Hello,

A doctoral student at xxx is conducting research on the engagement and sense of belonging of Chinese students in U.S. universities and would like to invite Chinese international students to participate!

Study Description: The purpose of the research is to help universities better understand the needs and lived experience of Chinese international students and provide resources and support so that Chinese students can get more fruitful experiences. The focus group interview will take you approximately one hour via Zoom in Mandarin Chinese. You will receive a \$10 Amazon gift card upon completion of the interview. Your participation in this research survey is completely voluntary, and not participating will in no way affect your relationship with this organization and university.

In order to participate, you must:

1. Be 18 years and older
2. Identify as Chinese international student
3. Speaks Mandarin Chinese

Thank you for your interest. To participate, or for more questions, please contact her at xxx

Appendix I

Information Sheet for Interview Data Collection

PURPOSE OF THE STUDY

The primary purpose of this research study is to explore student engagement and belongingness, specifically with Chinese international students in the U.S. According to the 2020 Open Doors Report on International Educational Exchange, for the tenth year, China is the largest source of international students in the United States, with 372,532 students enrolled in academic programs. However, even though many Chinese international students live and study in the U.S., very little research has been conducted on their college experiences. In particular, there is a limited amount of research exploring whether or not Chinese international students are engaging effectively with their college or university environments or perceive a sense of belonging in their school setting. The results will inform institutional strategies to cultivate positive and fruitful experiences to promote engagement and belongingness.

PARTICIPATION

Participants need to be Chinese international students at least 18-year-old. For this study, Chinese international students were defined as individuals who were Chinese nationals and came to the U.S. to pursue higher education. These may include holders of F (student) visas, H (temporary worker/trainee) visas, J (temporary educational exchange-visitor) visas, and M (vocational training) visas. If you identify yourself as Immigrants, refugees and who participate in short-term educational programs (e.g., language, volunteer programs), please do not proceed.

This study involves the participation of Chinese international students in a focus group interview. This interview session will last approximately one hour via Zoom in Mandarin Chinese and will be audio recorded. Please select a location that you will be comfortable answering questions and will not be overheard. You will receive a \$10 Amazon gift card for participation in the focus group interview.

RISKS AND CONFIDENTIALITY

Several procedures have been put in place to protect participants' anonymity and confidentiality. All the identifiers of the participants will be removed for this study. The researcher will assign a random English name to each participant in the interview. Only the researchers have access to the data, and all the data will be securely stored on the researcher's password-protected laptop.

Please assure each other of complete confidentiality by not sharing any of the information discussed in this session.

WITHDRAWAL

Participation is solely voluntary, and confidentiality will be ensured. You will be able to quit the interview at any time.

CONTACT

If you have any questions, complaints, or concerns about your participation in this research, please contact:

Yingying Jiang
Doctoral Student
School of Education, xxx