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First-Generation College Students and Sense of Belonging at School: The Moderating Effect of Remote Learning

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**FIRST-GENERATION COLLEGE STUDENTS AND SENSE OF BELONGING AT
SCHOOL: THE MODERATING EFFECT OF REMOTE LEARNING**

by

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ABSTRACT

FIRST-GENERATION COLLEGE STUDENTS AND SENSE OF BELONGING AT SCHOOL: THE MODERATING EFFECT OF REMOTE LEARNING

Christina Su Ju
Old Dominion University, 2023
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This study examines the effect of first-generation college student status on students' sense of belonging, and whether remote learning moderates this effect. Specifically, this study examines whether first-generation college students' sense of belonging at university differs from their continuing-generation college student counterpart, and whether taking remote courses impacts that relationship. It was hypothesized that first-generation college students would report lower sense of belonging than continuing-generation college students, and that remote learning would moderate the relationship such that the negative effect of first-generation student status on sense of belonging is strengthened when the student takes more remote courses. Survey data from college students were used to test the hypotheses. There were 175 observations for the testing of Hypothesis 1 and 137 observations for the testing of Hypothesis 2. Results showed that the relationship between first-generation college student status was not significant. Additionally, the moderating effect of remote learning was not significant. These results suggest that first-generation college students do not differ in sense of belonging from their peers, and that remote learning does not impact the relationship between first-generation college student status and sense of belonging. Results of the study provide insight into ways universities can help promote students' sense of belonging. Future research regarding students' sense of belonging should consider the roles that both academic integration and social integration play in shaping students' feelings about and experiences at school.

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INTRODUCTION

Over the past few decades, the population of the United States has steadily become more diverse, which is reflected in the student populations of higher education institutions (Winkle-Wagner & Locks, 2013). The number of traditionally underrepresented groups (e.g., racial and ethnic minorities, low-income students) attending colleges and universities has increased steadily (Adams & McBrayer, 2020). In many cases, these individuals are first-generation college students. A first-generation college student (FGCS) is defined as an individual who comes from a family in which neither parent has postsecondary education experience (Cataldi, 2018; Redford et al., n.d.); alternatively, non-FGCS are referred to as continuing-generation college students (CGCS). First-generation students represent a unique population of individuals that encompass an intersectionality of racial and ethnic backgrounds, socioeconomic status, and family and caregiver dependency and responsibility (Blaney & Stout, 2017; Cataldi, 2018; Gibbons & Borders, 2010).

First-generation college students typically have different backgrounds and college experiences than their continuing-generation student counterparts (Longwell-Grice, 2008). Non-White students are more likely to be FGCS than CGCS (Cataldi, 2018; Gibbons & Borders, 2010). Additionally, first-generation college students are more likely to come from working-class backgrounds or poverty and are more likely to work while in school than CGCS (Jenkins & Miyazaki, 2009; Reardon, 2013; Redford et al., n.d.). According to the National Center for Education Statistics (NCES), the median family income for first-generation first-year students at two-year and four-year institutions was \$37,565, compared to \$99,635 for CGCS in the 2015-2016 academic year (Cataldi, 2018). First-generation college students face challenges beyond the economic realm. Whereas prospective CGCS typically perceive only barriers related to finances

and school stress, prospective FGCS further perceive family issues, racial/ethnic discrimination, lack of college-educated role models, lack of college-planning guidance, negative educational role models, and lack of preparation as perceived barriers to attending college (Gibbons & Borders, 2010).

Despite universities successfully recruiting and enrolling first-generation college students, these students tend to lag behind their continuing-generation peers in terms of attrition, attendance, persistence, and overall success in college (Collier & Morgan, 2008; Gibbons & Borders, 2010). Since first-generation college students are a group at risk of not succeeding in and graduating from college, there is a need for greater research and administrative attention (Longwell-Grice, 2008). One possible explanation for FGCS experiencing poorer outcomes is that they are more likely to report lower sense of belonging in school and in their major programs than their CGCS counterparts (Blaney & Stout, 2017; Gibbons & Borders, 2010; Gopalan & Brady, 2020; Stebleton et al., 2014). The need to belong is theoretically established as a basic psychological need and human motivation that compels us to establish and maintain social connections in all realms of our lives (Baumeister & Leary, 1995). Belonging has been described as a need for interpersonal relationships that are positive and secure, as well as a sense of fit or potential fit between oneself and a specific setting or context (Neighbors et al., 2021). When belonging is fulfilled, it can result in strong, positive effects on an individual's emotional patterns and cognitive and behavioral processes (Baumeister & Leary, 1995). Sense of belonging has previously been linked to outcomes crucial for student success, such as persistence, retention, increased psychological wellbeing, and better grades (Blaney & Stout, 2017; Pittman & Richmond, 2008; Walton et al., 2015; Walton & Cohen, 2007). Thus, the fulfillment of sense of

belonging plays a vital role in ensuring student success in higher education, which has implications for success post-graduation and into the workforce.

According to Tinto's (1993) theory of student integration, college students are more likely to persist and remain enrolled in college if they are integrated into the social and academic life of the institution. When students become attached to the academic or intellectual realm of the college, this results in academic integration, whereas social integration is the result of students creating personal relationships and connections (Karp et al., 2010). Accordingly, student sense of belonging on college campuses can be facilitated by meaningful experiences in the classroom (O'Keeffe, 2013; Zamora et al., 2022). For example, when a student successfully interacts with peers and faculty in traditional classrooms, sense of isolation decreases while sense of community and support increases, indicating that positive, in-person interactions may strengthen student sense of belonging (Zamora et al., 2022). Additionally, positive student-instructor relationships are key predictors for students' sense of belonging at school (O'Keeffe, 2013; Tice et al., 2021). Although research has been conducted on how colleges can facilitate sense of belonging for students, this research assumes that students are taking courses traditionally, with face-to-face interactions with their peers and professors. Research has yet to explore complications that remote learning may bring for students' sense of belonging.

The COVID-19 pandemic presented higher education with unique challenges and disruptions. Specifically, during the peak of the pandemic in 2020, remote learning became the default modality with nearly 73% of college students taking their courses partially or fully online (Lederman, 2021). Although many colleges and universities are now returning to traditional face-to-face teaching methods (Anderson & Lumpkin, 2022), remote learning and hybrid options (i.e., a mix of in-person courses and remote courses) remain a viable alternative to in-person

learning environments for college students as the pandemic continues to recede (Singer, 2021). However, remote learning may hinder the fulfillment of belonging, as it may limit opportunities for meaningful social interactions (Zamora et al., 2022). This is especially concerning for first-generation college students, who already report lower feelings of belonging at college and greater concerns about their sense of belonging than continuing-generation students (Strayhorn, 2018; Walton & Cohen, 2007). Research has yet to compare the effectiveness of traditional face-to-face instruction compared to fully remote learning in bolstering students' sense of belonging, especially for underrepresented student populations, thus the proposed study aims to fill this gap.

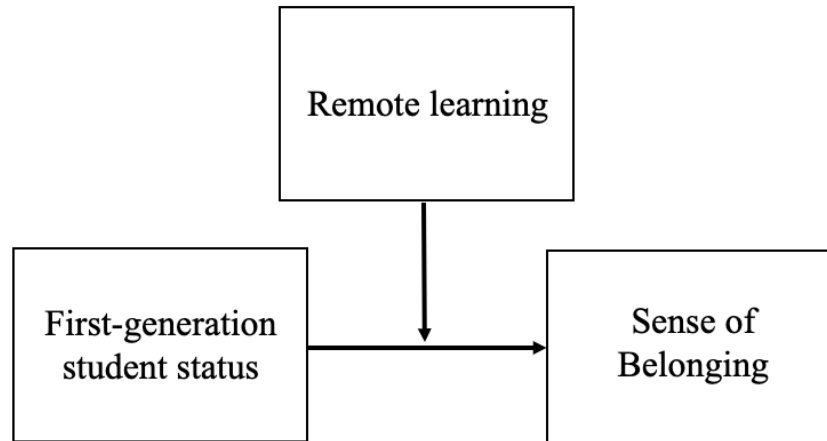
The purpose of this study is to use Tinto's integration framework (1993) to examine the relationship between first-generation college students and sense of belonging with remote learning as a moderator. Specifically, I hypothesized that there would be significant differences in sense of belonging between first-generation students and continuing-generation students, such that first-generation students would report lower sense of belonging than continuing-generation students. Additionally, I expected this relationship to be moderated by remote learning, such that first-generation students' sense of belonging will be more negatively impacted when the student takes more remote classes. The proposed model is provided in Figure 1 below.

The proposed study presents several theoretical and practical contributions. First, it adds to the existing literature on first-generation college students by examining how sense of belonging differs between first-generation students and continuing-generation students. Second, this study attempts to understand how different learning environments affect student outcomes, by examining how remote learning may influence the relationship between first-generation student status and sense of belonging using Tinto's integration framework (1993). Additionally, by evaluating the moderating role of remote learning, the results can provide suggestions for

implementation of remote and hybrid courses, such that students' need for belonging is not negatively impacted. Lastly, this study explores the importance of first-generation student status and how the stressors that FGCS experience may influence sense of belonging. As such, postsecondary institutions can implement the findings of the current study when developing academic programs, courses, and policies to best support students of underrepresented backgrounds.

Figure 1

Proposed model



BACKGROUND

FIRST-GENERATION COLLEGE STUDENTS

There is discourse surrounding the definition of first-generation college students, with some sources defining FGCS as students with parents who do not have four-year bachelor's degrees, while other definitions state that neither parent has any postsecondary education (Collier & Morgan, 2008; Redford et al., n.d.; Stephens et al., 2012). Consistent with prior research and the U.S. Department of Education's definition, first-generation college students in this study are defined as students whose parents have no postsecondary education experience (Cataldi, 2018; Ishitani, 2006; Redford et al., n.d.). Non-FGCS are referred to as continuing-generation college students, whose parents have any college education, including 2- or 4-year college, regardless of degree status (Cataldi, 2018; Gibbons & Borders, 2010). FGCS are a unique population, as they often come from minority backgrounds, lower socioeconomic classes, and face stressors in their college environments that CGCS may not experience (Cataldi, 2018; Fry, 2021; Gibbons & Borders, 2010; Stephens et al., 2012).

FGCS are more likely to be people of color than CGCS (Cataldi, 2018; Gibbons & Borders, 2010). Although nearly half of FGCS reported in 2012 were White (49%), there was a lower percentage of White FGCS than White CGCS (49% vs. 70%, respectively; Redford et al., n.d.). However, this pattern was reversed among Black and Hispanic students. Black students represented 14% of FGCS, compared to 11% of CGCS, and Hispanic students represented 27% of FGCS compared to 9% of CGCS (Fry, 2021).

There are significant economic disparities between FGCS and CGCS. FGCS are more likely to come from working-class backgrounds and poverty compared to CGCS (Jenkins &

Miyazaki, 2009; Reardon, 2013; Redford et al., n.d.). According to the National Center for Education Statistics (NCES), the median family income for first-generation first-year students at two-year and four-year institutions was \$37,565, compared to \$99,635 for CGCS in the 2015-2016 academic year (Cataldi, 2018). In 2021, households headed by an adult without a college-educated parent had less than half the median wealth (\$60,700) of similar households headed by an adult who had a parent with at least a bachelor's degree (\$132,100; Fry, 2021). Furthermore, a larger percentage of FGCS came from lower-earning households than CGCS in 2012— that is, households with incomes at or below \$20,000 (27% for FGCS households vs. 6% for CGCS households) and \$20,001 to \$50,000 (50% for FGCS households vs. 23% for CGCS households) (Redford et al., n.d.). As a result of coming from families with fewer financial resources than CGCS, FGCS tend to support more financial dependents (Cataldi, 2018), work one or more jobs to pay for their tuition and living expenses (Stephens et al., 2012), and report less financial support from their families for their pursuance of higher education than CGCS (Gibbons & Borders, 2010). Furthermore, economic disparities between FGCS and CGCS continue even after obtaining a bachelor's degree and joining the workforce. The median household income for a first-generation college graduate is \$99,600 compared with \$135,800 for a second-generation college graduate (Fry, 2021).

Parents' college-going experiences can serve as useful cultural capital for college students (e.g., understanding the significance of a class syllabus, the meaning of "office hours", how to navigate campus, how to cite sources in written assignments; Collier & Morgan, 2008), thus, FGCS who lack this vital resource often perceive more barriers to college attendance than their CGCS counterparts. Finally, first-generation students are less likely to complete college than continuing-generation students, even after controlling for family income, academic

preparation, and ethnicity (Gibbons & Borders, 2010; Horn & Nunez, 2000; Terenzini et al., 1996), which suggests that first-generation status uniquely contributes to differences in attrition, attendance, persistence, and overall success in college.

SENSE OF BELONGING

Self-Determination Theory and the Need to Belong

Self-determination theory (SDT) is a macro theory of human motivation that highlights the importance of evolved inner resources for personal development and behavioral self-regulation (Ryan & Deci, 2000). SDT was developed by Deci and Ryan (1985) to explain intrinsic motivation and subsequent behavior and well-being (O'Hara, 2017). Self-determination theory posits that humans have three basic psychological needs: competence, autonomy, and belonging that, when fulfilled, yield enhanced motivation and psychological well-being (Ryan & Deci, 2000). Competence is associated with an individual's abilities and their desire to engage in activities that maintain and refine their capabilities. Autonomy is the ability to self-initiate and feel that actions are self-endorsed. Lastly, belonging (also referred to as relatedness in SDT literature) concerns the need to feel connected to others and to a community (Ryan & Deci, 2000).

Sense of belonging is a fundamental psychological need as it is essential in establishing and maintaining social connections (Baumeister & Leary, 1995). The fulfillment of belonging can result in strong, positive outcomes for individuals, ranging from positive emotional patterns and cognitive and behavioral processes to increased wellbeing and health (Baumeister & Leary, 1995).

Sense of Belonging in College

The importance of a sense of belonging is determined by context and time (Strayhorn, 2018). Being in a new setting, such as a new city or workplace, and being at a certain age, such as young adulthood or adolescence, can make a sense of belonging more important to an individual. Accordingly, sense of belonging is important within the educational context, especially when students start college. The transition to college usually involves many notable changes that are stressful for students, such as relocating and/or moving outside of the primary household, changes in social networks and activities, the adjustment of the college course rigor, and being away from family for extended periods of time (Pedler et al., 2022; Ross et al., 1999; Strayhorn, 2018). Within higher education, a sense of belonging is typically conceived as how comfortable a student feels being themselves at their institution, whether they feel valued by their institution, and whether they feel that they are part of the community (*Building a Sense of Community for All*, 2021; Strayhorn, 2018; Tice et al., 2021). It is a subjective feeling of connection and integration with their institution and the campus community that is influenced by interactions with environmental, social, and cognitive factors (Pedler et al., 2022). Thus, school belonging goes beyond individual relationships within the school to a more global sense of belonging and feeling connected to a larger community (Pittman & Richmond, 2008).

Sense of belonging is associated with several positive outcomes that are critical for students and their academic success. At four-year institutions, sense of belonging has been positively correlated with student persistence, academic engagement, and grades and achievement (Blaney & Stout, 2017; Gillen-O'Neel, 2021; Gopalan & Brady, 2020; Pedler et al., 2022; Walton et al., 2015; Walton & Cohen, 2007). A sense of belonging is especially critical for student retention, as students who do not feel they belong and feel that there is a mismatch

between their background and their college are at a higher risk of discontinuing their pursuit of higher education, resulting in higher attrition rates (Hoffman et al., 2002; Strayhorn, 2008). Conversely, students with a lower sense of belonging are more likely to skip lectures or disengage during course discussions (Zamora et al., 2022).

Sense of belonging has also been positively related to students' mental health and self-perceptions. Increases in belonging during a student's first year of college has been affiliated with increased psychological well-being, encompassing increased perceived self-worth and perceived scholastic competence (Pittman & Richmond, 2008). Several studies have established that a fulfilled sense of belonging is related to reduced rates of depression, loneliness, and social anxiety (O'Keeffe, 2013; Raymond & Sheppard, 2017; Stebleton et al., 2014). Sense of belonging may buffer effects of stress and lead to an overall improvement of mental health (Baumeister & Leary, 1995). Thus, understanding sense of belonging appears to be an important factor in improving student achievement and wellbeing.

Main Effect Hypothesis — First-generation college students and belonging

As discussed, a fulfilled sense of belonging is associated with important, positive outcomes for college students, both within and beyond the academic realm. Research has demonstrated that FGCS consistently report a lower sense of belonging at school and in their major programs than their continuing-generation peers (Blaney & Stout, 2017; Gibbons & Borders, 2010; Gopalan & Brady, 2020; Pedler et al., 2022). Further, a growing literature indicates that students from underrepresented racial-ethnic minority (African-American, Hispanic, and Native) and FGCS backgrounds report lower belonging and greater concerns about their belonging (Strayhorn, 2018; Walton & Cohen, 2007). Thus, FGCS face additional barriers

that may prevent them from feeling a sense of belonging in college, which may hamper their academic success and personal wellbeing.

Tinto's (1993) academic and social integration model provides a useful framework for examining sense of belonging and especially how sense of belonging differs between FGCS and CGCS. A main premise of the model is that if the university provides enough opportunities for students to engage with the institution, students will become integrated into the college and persist at a higher rate (Tinto, 1993). According to Tinto's (1993) theory, students who become a part of their campus academically and socially are more likely to stay in their program of study. Academic integration involves engagement in activities related to academic success in and outside of the classroom setting. Mechanisms of formal academic integration include attending classes and review sessions, while mechanisms of informal academic integration include interactions with faculty during office hours (Chrysikos et al., 2017; Tinto, 1993). Academic integration can be measured by the student's performance in their classes, their intellectual development, and their perception of having a positive experience in academic settings, which all reflect how well the student has adopted the academic norms of their institution (Tinto, 1993). Social integration occurs formally through participation in extracurricular activities, such as honors societies, service organizations, and fraternities and sororities, as well as informally, through interactions with peer groups, such as spending time with friends from the same resident hall (Chrysikos et al., 2017; Tinto, 1993).

When students feel that they are integrated socially and academically to their institution, they are more likely to feel a sense of belonging at their institution (Hurtado & Carter, 1997; Johnson et al., 2007). Rather than the expectation for students to bear sole responsibility for their integration into existing institutional academic and social structures, sense of belonging

illustrates the interaction between what the institution provides to the student, what the student utilizes, and how the student perceives those provisions (Johnson et al., 2007). This process potentially explains why FGCS may report lower sense of belonging than their peers, as they are not as easily able to integrate socially and academically to their institution and perhaps have different perceptions of their institution due to the unique stressors and challenges they experience. For example, a FGCS who spends their time outside of class working may report a lower sense of belonging since they have not developed meaningful relationships with their on-campus peers, indicating that they have not successfully integrated socially to their institution.

Therefore, first-generation college students are expected to report a lower sense of belonging at their university than continuing-generation college students. The following hypothesis is proposed:

H1: First-generation student status will have a negative relationship with sense of belonging, such that first-generation students report a lower sense of belonging than their continuing-generation counterparts.

REMOTE LEARNING

When the COVID-19 outbreak began in 2020, educational institutions around the world launched various policy initiatives to continue delivering courses while slowing the spread of the virus (Ali, 2020). Because social distancing and government lockdowns became the norm, schools needed to determine how to continue instruction without traditional classrooms and face-to-face methods. As a solution, many schools transferred education from face-to-face into remote teaching (Ali, 2020; Bashir et al., 2021). Remote education or learning, also called online education or learning, occurs when the instructor is separated from students in distance and is facilitated through technology, such as online learning management systems (Blackboard,

Canvas, Moodle, etc.) and video conferencing (Zoom, Skype, etc.; Bashir et al., 2021; Morgan, 2020). Although the shift to an online platform satisfied the need for social distancing, the unprecedented and sudden change disrupted many students' learning and caused various challenges. Across the higher education sector, social and digital inequality, declining student mental health and wellbeing, and ineffective learning and engagement were all issues highlighted by remote education (Bashir et al., 2021; Morgan, 2020; Murphy et al., 2020).

The seemingly overnight change from in-person instruction to remote learning due to the pandemic reflects an 'extreme' case of transformation from traditional classroom settings to an online format (Gnaur et al., 2020). Students' negative experiences with remote learning were arguably influenced by the quick, abrupt shift caused by the spread of the virus, which did not allow faculty adequate time to prepare for remote teaching in the most effective manner (Murphy et al., 2020). Additionally, the pandemic increased stress, uncertainty, and frustration across the general population for a multitude of reasons (loss of social outlets, health concerns, job uncertainties, changes to daily life routines, etc.), further exacerbating students' anxieties and stress regarding remote learning (Murphy et al., 2020; Yildirim & Eslen-Ziya, 2020). Despite the challenges associated with the sudden shift to remote learning during the height of the pandemic, some students benefitted from the online format. Remote learning is not a new concept in the higher education world; colleges have offered online classes and programs for decades (Lei & Gupta, 2010). Increasing student enrollment and advances in technology have allowed colleges to offer more remote education options over the years, making higher education more accessible (Lei & Gupta, 2010).

Hybrid and In-Person Learning, vs. Remote Learning

One solution that draws from the most effective features of traditional, face-to face methods and online instruction is hybrid learning, or mixed mode learning (Snart, 2010). Hybrid learning is not simply a combination of both types of instruction, as it focuses on the optimization of learning by finding the best way to integrate learning technologies, course design, and instructor methods (Meydanlioglu & Arikan, 2014). Hybrid learning is the thoughtful combination of both face-to face and online instruction, where students either take some courses in-person and others online or take courses that are individually blended with online and in-person instruction (Snart, 2010). In past research, hybrid learning was found to be more successful than traditional learning in terms of course achievement, attitudes towards course material, student satisfaction with the course and instructor, and higher exam performance (Riffell & Sibley, 2005; Stewart et al., 2012; Uzun & Senturk, 2010). Hybrid education may provide students with a balance of the flexibility and freedom of online courses and the face-to-face interactions with peers and faculty of in-person courses.

According to the most recent edition of the Changing Landscape of Online Education (CHLOE) report, it is predicted that by 2025, hybrid programs and courses will become the norm for students at postsecondary institutions (Quality Matters, 2022). The CHLOE report also predicts that traditional-aged undergraduates are more likely to take face-to-face courses, while adult undergraduates and graduate students are more likely to be fully online (Quality Matters, 2022). As online and hybrid education continues to become more widely available, it is crucial for higher education providers to determine how to optimize remote learning environments and promote student success without adopting a one-size-fits-all approach.

Benefits and Challenges of Remote Learning

One major benefit associated with remote learning is the flexibility and freedom students have to work at their own pace, which is especially advantageous for students who work full-time, are parents, or who have complex schedules (Lei & Gupta, 2010). This flexibility of access and participation is also attractive for lifelong learners—people with the idea that learning occurs over the lifetime, as they can choose what to learn, when to learn, from and with whom, and where they learn due to the vast availability of online courses (Schuetze, 2014).

Students can save time and money from not commuting to campus, which accommodates both students with busy schedules and students with physical disabilities (Lei & Gupta, 2010). Moving around a college campus on a regular basis can be challenging for students with physical disabilities, especially since some campuses do not have consistent facilities and resources (wheelchair ramps at every building's entrance, functioning elevators, etc.) to accommodate physically disabled individuals (Simonson et al., 2013).

Remote learning also presents significant challenges for students, mostly pertaining to academic and social integration as described by Tinto (1993). Remote learning may prevent meaningful interactions and thus intensify barriers to academic and social integration. Students taking online courses often report a sense of isolation resulting from a lack of interaction with faculty and peers (McInnerney & Roberts, 2004). Even on-campus students enrolled in online courses may experience feelings of isolation from the rest of the participants in the online course, indicating an underlying issue with online courses that goes beyond students' physical distance from the university campus (McInnerney & Roberts, 2004).

This issue of isolation, or the feeling of aloneness, is an important criterion for student satisfaction with online courses (Daugherty & Funke, 1998). Previous studies have shown that

engaging in meaningful experiences can positively impact students' sense of belonging (Zamora et al., 2022). For example, when a student successfully interacts with peers and faculty in face-to-face classrooms, sense of isolation decreases while sense of community and support increases, indicating that positive, in-person interactions may strengthen student belonging through academic integration (Freeman et al., 2007; Zamora et al., 2022). Further, when students participate in online courses, they typically do not receive immediate feedback or reactions as they would during face-to-face communication, highlighting the isolation students experience when taking online courses (Wegerif, 1997). Additionally, students may face more difficulty developing relationships with their professor when taking online courses than in-person courses. Positive student-instructor relationships and interactions with university faculty are key predictors of academic integration and thus for students' sense of belonging at school (Freeman et al., 2010; Tice, 2021; Tinto, 1995). Even when remote students do interact with faculty and peers in the online environment, media richness theory explains how social interactions through instant messaging and emails are not as rich as face-to-face interactions as they restrict access to nonverbal cues (e.g., intonation, posture, facial expression; Daft & Lengel, 1986).

Remote learners tend to have fewer opportunities to join university social groups. Students taking online courses often report feelings of social isolation (Erichsen & Bolliger, 2011; Stoytcheva, 2021), especially when they do not reside on campus and face physical distance from their peers, resulting in a lack of opportunity for both formal and informal social interactions (Lundberg & Sheridan, 2015). Students who have reported high quality of friendships and higher degrees of in group activities at their college typically report higher levels of belonging (Hoyle & Crawford, 1994; Pittman & Richmond, 2008). In group activities, or extracurricular activities, are academic or nonacademic activities performed voluntarily outside

of the classroom and are excluded from curriculum (Civitci, 2015). Belonging to fraternities and sororities and attending art, sport, and music activities are some nonacademic extracurriculars that bolster social integration, while joining study groups and honors societies are academic extracurriculars that can bolster both social and academic integration. Participation in extracurricular activities at the university is an indicator of social integration and is one of the most important factors in student satisfaction with their university (Chapman & Pascarella, 1983). Accordingly, students who engage in extracurricular activities and develop high quality friendships at their college are more likely to report a greater sense of belonging at their college; however, remote learners face barriers to both of these key predictors of social integration, especially when living away off campus (Lundberg & Sheridan, 2015; Pittman & Richmond, 2008). Thus, since FGCS are already vulnerable to a lower sense of belonging at their university than CGCS, learning remotely rather than in-person may further exacerbate this lower sense of belonging. Given the above, the proposed hypothesis regarding the moderating effect of remote learning is as follows:

H2: The degree to which the student learns remotely will moderate the negative relationship between first-generation student status and sense of belonging, such that the negative effects of first-generation student status on sense of belonging will be stronger for students who learn remotely than in person.

METHOD

PARTICIPANTS AND PROCEDURE

The sample for this study was collected through an online survey sampling platform, Cint, in June of 2023. To be included in this study, participants must have been 18 years old and report current enrollment in college classes. The total sample collected was 239 participants. After additional exclusions (described in detail below), the final sample used for hypotheses testing analyses included 175 participants for the testing of Hypothesis 1 and 137 participants for the testing of Hypothesis 2.

An anonymous, online survey hosted in Qualtrics was administered to participants who were recruited through Cint. The survey was launched on June 2nd, 2023 and was closed on June 3rd, 2023. Before accessing the survey, participants read and agreed to the informed consent form (Appendix A). This study was reviewed by the College of Sciences Human Subjects Committee of the Institutional Review Board and was granted exempt status (IRB #2020033).

Regarding gender, within the sample, 12.57% were men, 84.57% were women, 2.29% were non-binary, and 0.57% were trans women. The mean age of the sample was 27.47 years ($SD = 8.39$, range = 18-72). Participants identified as being White (54.08%), Black (16.84%), Asian (12.76%), Hispanic or Latinx (11.73%), Native American or Alaska Native (3.06%), Native Hawaiian or Pacific Islander (1.02%), or other, not listed (0.51%). Most of the sample (72.0%) were single, never married. Of the remaining, 15.43% were married, 6.29% were in a domestic partnership, 3.43% were divorced, 1.71% were separated, and 1.14% were widowed.

Regarding when participants started their college career, many participants had their first semester at university in 2022 (32.18%) and 2021 (21.84%). Other participants had their first

semester at university in 2020 (13.79%), 2019 (12.07%), 2018 (7.47%), and years prior to 2018 (12.63%). A total of 60 majors were represented including nursing (7.43%), psychology (6.29%), criminal justice (5.71%), business administration (5.14%), biology (4.0%), and other majors that each represented less than 4% of the sample. All participants reported having in-person engagements at school outside of their courses. Participants reported having internships (23.46%), being a member of a club (20.58%), working/volunteering in a research lab (19.34%), having a leadership position within their school (12.76%), being in the athletics department at their school (9.47%), or having another engagement at school (14.40%).

The power of a statistical test represents the probability of correctly rejecting a false null hypothesis (Darlington & Hayes, 2017). An *a priori* power analysis was conducted using G-Power software, using an alpha level of .05 and a desired Cohen's *d* effect size of .2, to determine the sample size necessary for the study. The power analysis determined that 81 participants from each group (81 participants identifying as FGCS and 81 identifying as CGCS) were necessary. Data was collected from 239 participants.

Based on literature recommendations to best identify careless responding (Meade & Craig, 2012), one quality check was included in the survey, which was a single-item measure: "Please select 'Strongly Agree'". The item was rated on the same 4-point Likert scale as the Sense of Belonging Index and was embedded in the string of belonging questions. If participants failed to endorse the "Strongly Agree" option, this indicated insufficient effort responding (IER; Huang et al., 2015), and their data were removed from the dataset. This step resulted in the removal of 49 participants, resulting in a total of 191 observations. Further, 16 participants reported that they were not currently enrolled in college, thus failing the requirement to be a current college student. This resulted in a total of 175 participants.

Upon further examination of the data, several participants either misunderstood or carelessly responded to the three items that measured credit hours, resulting in participants reporting more remote or hybrid credit hours than total credit hours (e.g., reporting 3 total credit hours but 6 remote credit hours and 3 hybrid credit hours). These data were removed ($n = 36$) for the testing of Hypothesis 2, but retained for the testing of Hypothesis 1. This removal resulted in 175 observations for the testing of Hypothesis 1 and 137 observations for the testing of Hypothesis 2.

MEASURES

First-Generation Student Status

First-generation student status was captured by having participants indicate whether they identify as a first-generation college student. This study's definition of a first-generation college student was provided to participants for clarification (i.e. if neither parent has postsecondary education experience). Following prior research and the U.S. Department of Education's definition (Cataldi, 2018; Gibbons & Borders, 2010; Redford et al., n.d.), participants were classified as first-generation if neither parent has postsecondary education experience and continuing-generation if at least one parent has any postsecondary education experience, regardless of degree status. Out of 175 participants, there were 89 first-generation college students and 86 continuing-generation college students.

Sense of Belonging

Sense of belonging was measured by the Sense of Belonging Index (PISA). Developed by the Organisation for Economic Co-operation and Development (OECD), PISA is a regular survey that measures the academic preparedness and student engagement of high school students in over 40 countries/regions. The scale was chosen due to its established use internationally to

measure student sense of belonging. The Sense of Belonging Index was originally developed for the Program for International Student Assessment (PISA) to measure sense of belonging amongst high school students. Internal reliability of the scale has been reported to be high in the United States (Cronbach's $\alpha = .86$; Willms, 2003). The internal consistency reliability for this study was $\alpha = .82$.

Consistent with Pedler et al.'s (2021) measure of student sense of belonging, the index was adapted for inclusion in the current study by replacing the word 'school' with 'university' for use in a higher education setting rather than a secondary school setting. The Sense of Belonging Index allows students to respond on a Likert scale with four choices: strongly agree, agree, disagree, or strongly disagree. The items included to measure sense of belonging were: I feel like an outsider (or left out of things) at university; I make friends easily at university; I feel like I belong at university; I feel out of place at university; Other students seem to like me; I feel lonely at university. Participants' scores were averaged for a final score.

Remote Learning

The degree to which a student learns remotely was captured through an open-response box that surveyed how many total credit hours were taken in the Spring 2023 semester, how many of those credit hours were taken fully remotely, and how many of those credit hours were taken in hybrid courses. The degree of remote learning is operationalized as the ratio of student's online course credit hours to total credit hours. For example, if a student reported taking 6 online credit hours, 6 in-person credit hours, and 3 hybrid credit hours, their remote learning score would be 0.5. Not including hybrid hours as a part of remote learning was a post hoc decision to be more conservative in the moderation analysis. By not including hybrid hours in remote hours,

this allowed for the examination of solely remote courses versus all other class environments (in-person and hybrid).

RESULTS

Preliminary analyses were run to test the assumptions of regression. The data were examined and cleaned using R Statistical Computing Environment (RStudio Team, 2020) to ensure that the data met the assumptions for multiple regression: independence, homogeneity of variance, no significant outliers, linearity, homoscedasticity, and normality (Darlington & Hayes, 2017). The data met the assumptions of independence, homogeneity of variance, linearity, homoscedasticity, and normality; however, there were a few outliers related to survey completion time in the dataset. The median completion time was 147 seconds, and the mean was 272.1 seconds. There were 20 participants who were potential outliers; however, these datapoints were kept as they all had longer completion times than average, which does not necessarily constitute as insufficient effort responding as short completion times often do (Huang et al., 2015).

Hypothesis 1 predicted a negative main effect of first-generation student status on sense of belonging. To test hypothesis 1, A two-sample *t*-test was conducted to assess the effect of first-generation student status on sense of belonging. The results suggest that students who identified as first-generation college students ($M = 2.8$ $SD = 0.583$) did not significantly differ in sense of belonging from students who identified as continuing-generation college students ($M = 2.8$, $SD = 0.659$), $t(168.79) = 0.28$, $p = .78$, 95% CI [-0.1595004, 0.2125010], Hedges' $g = 0.042$.

Hypothesis 2 predicted that remote learning would moderate the relationship between first-generation student status and sense of belonging, such that the negative effects of first-generation student status on sense of belonging would be stronger for students who learn remotely than in person. The moderation of remote learning was modeled as an interaction term

between first-generation student status and sense of belonging, with remote learning centered around the group mean to reduce nonessential multicollinearity and produce more meaningful and interpretable coefficients (Darlington & Hayes, 2017). The analysis revealed that the interaction between first-generation student status and remote learning was not statistically significant ($F = .03, p = .99$), which suggests that remote learning does not moderate the relationship between first-generation student status and sense of belonging.

DISCUSSION

Student populations of higher education institutions have become increasingly diverse over the past few decades, specifically, seeing an increase in the enrollment of first-generation college students; the percentage of which has increased by 1.53% nationwide from 2016 to 2018 alone (Adams & McBrayer, 2020; Hamilton, 2023; Wagner & Locks, 2013). First-generation college students typically encounter challenges to their pursuit of higher education that their continuing-generation counterparts do not, which pose threats to their overall success in college (Collier & Morgan, 2008; Gibbons & Borders, 2010). More specifically, FGCS may feel that they do not belong at their university, which would have consequences for their wellbeing and persistence in school (Blaney & Stout, 2017; Pittman & Richmond, 2008). According to Tinto's (1993) theory of student integration, student sense of belonging can be facilitated by meaningful interactions in the classroom and positive instructor-student relationships. With the gaining popularity of remote learning after the peak of the COVID-19 pandemic, students, and especially FGCS, may not experience meaningful classroom interactions and develop relationships with their instructors, impeding their sense of belonging at school (Lederman, 2021; Zamora et al., 2022). The purpose of the current study was to examine the relationship between first-generation student status and sense of belonging and whether remote learning would moderate this relationship. This study had two hypotheses: 1) FGCS would report a lower sense of belonging than CGCS, and 2) Remote learning would strengthen this negative relationship, such that the negative effects of FGCS status on sense of belonging would be stronger for students who learn remotely than in-person.

As indicated in the results, Hypothesis 1, predicting sense of belonging from FGCS status, was not supported. This result was surprising, as there is strong theoretical support and

empirical evidence supporting the notion that FGCS would report lower sense of belonging than CGCS. Specifically, numerous studies have demonstrated this difference empirically in sense of belonging at school and in major programs between FGCS and CGCS (Blaney & Stout, 2017; Gibbons & Borders, 2010; Gopalan & Brady, 2020; Pedler et al., 2022). Furthermore, a few studies have also examined how students of underrepresented racial-ethnic backgrounds and of FGCS status report lower belonging and more concerns about their belonging than their peers (Strayhorn, 2018; Walton & Cohen, 2007).

One potential explanation for this result is that the current sample had an average participant age of 27.47 years, while the “traditional” age range of undergraduate students is defined as 18-24 years (PNPI, 2023). Existing research on sense of belonging of college students has focused primarily on students within the traditional age range and/or in their first year of college (Freeman, 2007; Gillen-O’Neel, 2021; Gopalan & Brady, 2020; Hoffman et al., 2002; Johnson et al., 2007). The need to belong is especially important during times of large transitions and change, such as graduating high school and leaving home for the first time to attend college (Pedler et al., 2022). Accordingly, older individuals who may have more stability in other realms of their life (e.g., friends, family, home location) may not worry about their sense of belonging at university like younger individuals might. This notion would be supported by the results of the current study, as most participants were older than the traditional age range of undergraduate students.

Hypothesis 2 examined the role of remote learning as a moderator in the relationship between FGCS status and sense of belonging. As indicated in the results, Hypothesis 2 was also not supported. There was no significant interaction between FGCS status and remote learning, which suggests that remote learning does not moderate the relationship between FGCS status and

sense of belonging. This result was surprising, as existing literature has highlighted students' feelings of social isolation resulting from a lack of interaction with faculty and peers in remote courses (Erichsen & Bolliger, 2011; Freeman et al., 2007; McInnerney & Roberts, 2004; Zamora et al., 2022). This feeling of isolation related to remote courses would suggest that remote learning would exacerbate feelings of not belonging at school; however, the results of the current study suggest that this does not occur.

One potential explanation for this finding is that all participants in the study reported being involved in “other engagements at school, in-person, beyond their courses”. According to Tinto’s (1993) integration model, both academic and social integration are critical components to bolstering students’ sense of belonging. Although many participants of this study were enrolled in remote courses, which was hypothesized to weaken sense of belonging, sense of belonging at university may have been bolstered through social integration, such as participation in student organizations, internships, athletics, etc. Previous research has demonstrated the importance of college extracurricular activities for student and career development (Foubert & Urbanski, 2006; Shiah et al., 2011), stress and coping (Civitci, 2015), and academic success and overall wellbeing (Guilmette et al., 2019). Thus, it is possible that participation in extracurricular activities provides students with resources to cope with stress and to promote development and wellbeing, which may buffer the isolating effects of remote learning on student sense of belonging.

Theoretical Implications

There are several theoretical implications for the current study. First, the nonsignificant main effect of FGCS on sense of belonging warrants more research in understanding what unique characteristics or experiences of the first-generation identity influence sense of belonging in FGCS. Since existing literature has found support for the relationship between FG status and

lowered sense of belonging, but this study did not, research should pivot toward understanding what mechanisms mediate the relationship. Further, since remote learning did not have an effect on sense of belonging, the conditions and circumstances of students' other life domains (e.g., work, family) and extracurricular involvement at university (e.g., student organizations, sports, religious groups, etc.) should be considered to capture the full extent of their experiences. Understanding how formal social integration mechanisms (e.g., extracurricular activities) and informal social integration mechanisms (e.g., spending time with college friends) influence sense of belonging in comparison to academic integration can help specify Tinto's (1993) model of integration, specifically by arguing that social integration plays a larger role in shaping a student's sense of belonging at school. Existing research highlights the importance of both extracurricular involvement and creating friendships at college in bolstering positive student development (e.g., sense of purpose, leadership skills, adjustment to college; Buote et al., 2007; Foubert & Urbanski, 2006; Kelling & Hoover, 2005; Pittman & Richmond, 2008), but more research is needed to determine when and how social integration plays a larger role than academic integration in bolstering students' sense of belonging specifically.

The findings of the current study also add to the discussion of the pros and cons of remote learning. Discussions surrounding remote learning and the challenges it poses for students has been pertinent since the COVID-19 pandemic forced many schools to abruptly switch into remote instruction in 2020 (Ali, 2020). A post-hoc analysis was conducted to determine if remote learning was a significant predictor of sense of belonging. Based on the results of a linear regression with remote learning as the predictor and sense of belonging as the outcome, remote learning did not predict sense of belonging. Thus, contrary to what existing research alludes to, this study found that remote learning does not negatively impact students'

sense of belonging. Future research should examine under what circumstances remote learning hinders students' academic success and sense of belonging. For example, perhaps remote learning does not weaken sense of belonging for more senior students, as they have already been socially- and academically-integrated to the school, while freshmen students have not. Thus, investigating sense of belonging within first-year student samples may be more salient than in a population with more senior students.

Practical Implications

Although the hypothesized results were not significant, this study still poses a few practical implications. First, the importance of sense of belonging at school has been well-supported by existing literature as it is related to key student outcomes such as student persistence and retention, academic engagement, and grades and achievement (Blaney & Stout, 2017; Gillen-O'Neel, 2021; Gopalan & Brady, 2020; Hoffman et al., 2002; Pedler et al., 2022; Strayhorn, 2008; Walton et al., 2015; Walton & Cohen, 2007). Thus, although the current study did not provide support for differences in sense of belonging between FGCS and CGCS populations, university administrators and instructors should still find ways to bolster all students' sense of belonging at university due to its relationship with important student outcomes. Furthermore, given that all participants in the sample reported engaging in extracurricular activities at school, university administrators should encourage students to join extracurricular engagements (e.g., sports, student organizations, fraternities and sororities) and should provide a variety of ways in which students can participate in these activities.

The current study did not find remote learning to be a significant predictor of students' sense of belonging. An alternative explanation for the results of the current study is that the average age of the sample was older than the "traditional" age-range of undergraduate students,

so perhaps older students' sense of belonging at university is not negatively impacted by taking remote classes, and their sense of belonging at university is fulfilled in a different manner.

University administrators and instructors should continue to monitor students' average grades and course satisfaction in courses taught in different instructional modes (in-person, hybrid, and remote). Further, end-of-course surveys should be provided so students can give feedback on how the mode of instruction impacted their experience in the course. This information would be beneficial to administrators and instructors when considering how to implement courses in future semesters.

Limitations and Future Directions

This study has several limitations. First, this study was cross-sectional in nature, so causal relationships between any of the variables cannot be confirmed. Future research would benefit from longitudinal data where changes in sense of belonging for FGCS and CGCS can be tracked over the college career. Additionally, the average age of the sample was higher than the age range of traditional undergraduate students, which indicates that the results are more applicable to nontraditional college students than traditional ones, as the study aimed to capture. Future research should compare differences in sense of belonging between FGCS and CGCS, and how remote learning moderates the relationship within first-year student samples or while controlling for age.

A key methodological limitation of the current study is the measurement of and operationalization of remote learning. Because there appeared to be no studies that directly observed differences in the quantity of remote learning, in-person learning, and hybrid learning, the current study employed a drop-down box of course credit hour options. Total credit hours, remote learning hours, and hybrid hours were captured through three separate drop-down boxes,

to which participants identified how many of their total course credit hours were taken in fully remote/online classes, and how many of their total course credit hours were taken in classes that utilized in-person and online instruction (hybrid). Remote learning was then operationalized as the ratio of remote learning credit hours over total credit hours. Several participants appeared to misunderstand these questions, as they reported more hybrid and/or remote learning credit hours than total credit hours, as discussed in the method section. Thus, future studies could refine the measurement of remote learning to create less confusion for participants. For example, a future study could capture credit hours in a series of questions, with the first question asking how many total credit hours the student is enrolled in. Then, each subsequent question could capture in-person credit hours, hybrid credit hours, and remote credit hours, which would each be limited by the individual's response to the first question (i.e., total credit hours), so that participants can accurately report how many of their credit hours are being taken in the different instructional modes.

Additionally, a more nuanced examination of remote learning would be beneficial in capturing what characteristics of remote courses impact students' experiences. Specifically, recent research suggests that synchronous instruction, as opposed to asynchronous instruction, may mitigate some students' feelings of isolation related to learning online and students may report higher levels of engagement (Moorhouse & Wong, 2022; Nguyen et al., 2021). Future studies should investigate what characteristics and pedagogical methods of online courses best increase student participation, course satisfaction, and sense of belonging. Future research could also adopt a longitudinal approach to measuring how remote learning impacts sense of belonging over time, as the current study only assessed these variables at one point in time.

Lastly, future studies should aim to capture the full extent of student experiences to determine what factors are related to sense of belonging at school. More specific and detailed questions that assess both students' social integration and academic integration (for example; students' extracurricular experiences, friendships at school, relationships with faculty, and class participation and engagement) could provide a more nuanced examination of how these domains impact sense of belonging.

Conclusion

This study aimed to expand the literature on FGCS and remote learning by examining how sense of belonging may differ for FGCS and CGCS, and how remote learning impacts that relationship. The proposed relationships were not supported, though results should be interpreted with caution as the current sample may have limited the ability to find a relationship. This study extends the literature on FGCS and remote learning and suggests that more research must be conducted on remote learning to understand when and to who it is beneficial for students' success.

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