The Effects of Student-Faculty Racial/Ethnic Match on Mechanisms That Influence BIPOC Graduation Rates

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By

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Dedication

This thesis is dedicated to my mentors and family, especially my mother who has always loved me unconditionally. Madre, lo hice. Soy la primera persona en nuestra familia en obtener un título avanzado. ¡Si se puede!
Abstract

The Effects of Student-Faculty Racial/Ethnic Match on Mechanisms That Influence BIPOC Graduation Rates

By
Daniel Garcia
Master of Arts in Psychological Science

Despite increased access to education, the graduation rates of Black, Indigenous, and People of Color (BIPOC) students continue to lag behind their enrollment rate (i.e., BIPOC enrollment-graduation gap). The current study examined how BIPOC faculty affect BIPOC students’ sense of belonging, possible selves, negative racialized experiences, and imposter syndrome. In turn, these factors may increase persistence and intent to graduate. Research demonstrates that having a professor of the same race/ethnicity (i.e., student-faculty racial/ethnic match) positively relates to BIPOC graduation rates. The following study utilized focus group interviews and a post-survey to understand the mentoring relationships of BIPOC students. The mixed-methods study utilized Tinto’s Interactionalist Theory of College Student Departure (1993) and Yosso’s Community Cultural Wealth Model (2005, CCW). Focus group discussions revealed that mentees’ educational attainment and aspirations are supported by BIPOC faculty and non-BIPOC faculty. However, BIPOC faculty provide additional support, such as counterspaces, helping students believe what is possible for them in the future, and facilitating their racial/ethnic identity. The quantitative portion did not reveal a significant difference between mentees that indicated a match and those that indicated a nonmatch on mechanisms influencing BIPOC graduation rates. The study identifies how BIPOC faculty positively affect mechanisms influencing BIPOC graduation rates, a current gap in the literature. The significance of these findings points to a better understanding of why the racial/ethnic interactions between undergraduates and faculty matter for student outcomes, which could lead to policies that address faculty recruitment and representation issues.
The Effects of Student-Faculty Racial/Ethnic Match on Mechanisms that Influence BIPOC Graduation Rates

Diversifying the undergraduate student body and retaining students to graduation is a goal for U.S. higher education institutions. Yet attaining that goal is challenging, especially for students from systemically minoritized communities. For example, Black and Latinx students graduate from college at lower rates than White students (NCES, 2017). To address these disparities, many institutions have developed initiatives to increase access to education, which has increased the enrollment of Black, Indigenous, and People of Color (BIPOC) students by 20% over the past 25 years (U.S. Department of Education, 2017). However, despite these efforts, the graduation rates of BIPOC students continue to lag behind their rate of enrollment (NCES, 2021). For example, in 2018, Latinx students made up 20% of all undergraduates enrolled in U.S. colleges and universities but were awarded only 14% of all bachelor's degrees. Similarly, Black students made up 12% and represented 9% of all awarded bachelor’s degrees, and American Indian students accounted for .6% of all enrolled students and obtained .4% of all degrees. In contrast, Asian students made up 6% of all enrolled students and 7% of all bachelors awarded, and White students made up 49% of all enrolled and 57% of all degrees awarded (NCES, 2021). As the U.S. increasingly becomes diverse, finding ways to increase retention and graduation rates for BIPOC students is imperative.

Students’ sense of belonging—feeling of connection to their community (Hurtado & Carter, 1997)—has been linked to academic performance, retention, and degree completion for BIPOC students (Collett, 2013; Tinto, 2016). Further, a substantial literature has demonstrated a sense of belonging is particularly important to the experiences of BIPOC undergraduate students (Holloway-Friesen, 2018a, 2018b; Hurtado & Ponjuan, 2005; Strayhorn, 2012). Additionally,
research in school settings has shown that highly developed possible selves are crucial for higher levels of persistence and academic achievement (Leondari et al., 1998; Oyserman & Fryberg, 2006).

In contrast, some factors negatively affect students’ persistence in college. For example, research indicates that negative racialized experiences and imposter syndrome are negatively related to persistence towards graduation (Muñoz, 1987), especially amongst BIPOC students (McClain et al., 2016; Riegle-Crumb et al., 2019). As such, for BIPOC students, experiencing negative racialized experiences may lead to a lower performance, which, in turn, is strongly related to not graduating within four years (Fischer, 2010). Moreover, research indicates that imposter syndrome works extensively against achieving academic goals (Ramsey & Brown, 2017).

Although very limited, research indicates that student-faculty racial/ethnic match (i.e., having a professor of the same race) affects BIPOC graduation rates. For example, Llamas et al. (2019) conducted a study that examined the effect of student-faculty racial/ethnic match on a sample of Asian, Latinx, and Black students. Llamas et al. (2019) found that having a student-faculty racial/ethnic match predicted higher grades, which, in turn, predicted students’ graduation rates. Further, research confirms the importance of same-race faculty, particularly regarding the retention of Black students attending predominantly White institutions (PWIs; Dancy, 2011; Strayhorn, 2010), also referred to as historically white colleges and universities (HWCU; Bonilla-Silva & Peoples, 2022), and their success in higher education (Griffin, 2012).

BIPOC faculty provide a sense of belonging (Hurtado et al., 2013; Ong et al., 2011), which positively affects persistence towards graduation (Hausmann et al., 2007). Furthermore, research also suggests that BIPOC faculty facilitate possible selves in BIPOC students (Fincher...
et al., 2010; Rask & Bailey, 2002). In turn, possible selves are positively related to persistence (Delahunty & O’Shea, 2020). BIPOC faculty help mitigate negative racial experiences and imposter syndrome amongst BIPOC students (Alexander & Moore, 2008; Karkouti, 2016), and this is critical to improving their retention (Chapman, 2017) and graduation rates (Fischer, 2010).

The literature examining how student-faculty racial/ethnic match affects BIPOC graduation rates has been primarily correlational. Therefore, the literature does not expound on how BIPOC faculty positively affect the academic achievement of BIPOC undergraduates, particularly graduation rates, and researchers have consistently pointed to this critical limitation (Cross & Carman, 2021; Dee, 2004; Egalite et al., 2015). In this study, I examined how BIPOC faculty affect BIPOC students’ sense of belonging, possible selves, negative racialized experiences, and imposter syndrome, which may increase persistence and intention to graduate.

To avoid deficit-language (e.g., ethnic minority, underrepresented minority (URM)), I used terms that connote equity and social justice. For example, I use “minoritized” to express that Black/African Americans, Hispanics/Latinxs, American Indians/Alaska Natives, Native Hawaiians, and other Pacific Islanders have been systemically minoritized from major sectors of higher education. This is different from “BIPOC”, which I use to indicate people of Black, Latinx, Native American/Pacific Islander, and Asian American descent.

**Literature Review**

*Factors Affecting BIPOC Student College Persistence*

**Sense of Belonging.** Experts characterize a sense of belonging as an awareness of mattering to one’s community and addresses the psychological elements of social integration and attachment to an institution (Hurtado & Ponjuan, 2005; Hurtado et al., 2015). Additionally, Tinto (2017) defined a sense of belonging as feeling part of the institution, whereas Hurtado and
Carter (1997) defined it as students’ psychological sense of connection to their community. This sense of connection to the community is essential because people typically desire to belong to communities. The failure to acquire a sense of belonging can have detrimental effects on their mental health and behavior (Baumeister & Leary, 1995; Hausmann et al., 2007).

Tinto (2016) stated that students’ sense of belonging was an important factor in persistence. Hausmann et al. (2007) examined a sample of 254 Black and 291 White undergraduate students at PWIs. After controlling for a range of demographic and college-level variables, they found that sense of belonging was a significant predictor of intent to persist for Black and White students. Consequently, Hausmann and colleagues argued for incorporating a sense of belonging as a vital factor in models of student persistence.

In addition, previous literature has demonstrated a sense of belonging is particularly important to the experiences of BIPOC undergraduate students (Holloway-Friesen, 2018a, 2018b; Hurtado & Ponjuan, 2005; Strayhorn, 2012). For example, Eakins and Eakins (2017) identified significant barriers contributing to the attrition rate for African American students: a lack of sense of belonging, campus climate, and a lack of diverse faculty and staff. Furthermore, increasing the connection and integration to college life experienced is essential for creating a sense of belonging and supporting degree completion for minoritized students (Collett, 2013). Thus, a sense of belonging appears to be an element of the learning environment necessary to support BIPOC student success (Museus, 2014; Tinto, 1993, 2017). These findings underscore the value of cultivating a greater sense of belonging among students to facilitate more positive persistence and degree completion outcomes. In this study, I examined students’ sense of belonging as an outcome of mentor-mentee relationships. I expected that students with mentors would higher sense of belonging. In the focus group, I asked participants how the mentor
(predictor) helped the mentee feel a sense of connection to the campus community (outcome).

**Possible Selves.** Research suggests that possible selves (PSs) are the future-oriented element of self-concept and are hypothetical images critical for motivating action (Higgins, 1996; Moretti & Higgins, 1990; Oyserman & Markus, 1990). Possible selves are ideas about what one might become in the future (Markus & Nurris, 1986). Markus and colleagues (1986) reported that ideas about oneself in the future could be very motivating. Individuals with clear ideas and goals about what they want to do, be, and be like seem more willing to put forth the effort needed to attain these hoped-for ideals. Additionally, they suggest that some individuals will work just as hard to avoid the possible selves that they fear. In either case, possible selves can increase one’s motivation to work hard to attain specific goals because possible selves are an essential link between self-concept and individual motivation (Cross & Markus, 1994; Markus & Nurius, 1986; Oyserman & Markus, 1990).

Research in school contexts found that students who had highly developed possible selves demonstrated higher levels of persistence on tasks and achieved more academically (Leondari et al., 1998; Oyserman & Fryberg, 2006), while feared selves were avoided with goal-directed action (Yowell, 2002). Additionally, studies show that youth with academic possible selves attain better school outcomes (Oyserman & Harrison, 1998). Moreover, research has also demonstrated that those with highly developed career possible selves are more goal-oriented and energetic (Meara et al., 1995) and more likely to persist with their goals (Pizzolato, 2007).

To date, the possible selves theory has primarily focused on family (Kerpelman et al., 2002; Rossiter, 2003) or K-12 school contexts (Oyserman et al., 2002; Pizzolato & Slatton, 2007), not higher education. However, Markus and Nurius (1986) suggested that possible selves could be assessed in college students. For example, most, if not all, college students have some
conceptual knowledge of what they hope, expect, and fear in the future. Furthermore, highly developed possible selves can influence aspirations and achievement from adolescence (Smith-Maddox, 2000; Oyserman & Fryberg, 2006) throughout the lifespan (Frazier et al., 2000). In the current study, I examined possible selves as an outcome in the context of mentor-mentee relationships. I expected that students with mentors would report highly developed possible selves (e.g., clear academic or career goals). Therefore, I participants were asked two questions about how their mentor (predictor) influenced their career or educational goals and thoughts about their future (outcome).

Yet some factors can hinder college students’ persistence towards graduation. This next section discusses two plausible factors that impede students’ academic persistence.

**Negative Racialized Experiences.** BIPOC students often face additional, unique challenges and stressors when entering the university compared to White students (Wei et al., 2011). These stressors range from racial microaggressions, discrimination, tokenism, harassment, and racial tension between faculty and peers, to the invisibility of first-generation college student status (Johnson-Ahorlu, 2012; Lee & Zhou, 2014; Rankin & Reason, 2005; Solórzano et al., 2000). Experiences of prejudice and discrimination can impact a student’s ability to integrate into their social and academic environment. In addition, these experiences can elicit a negative racial/ethnic climate that permeates student interactions throughout campus (Tinto, 1993). A negative campus racial/ethnic climate can produce an unwelcoming, discouraging university environment, leading to students’ failure in academic work and low persistence in staying at a university (Hurtado et al., 1999).

Researchers argue that the campus racial/ethnic climate is important in understanding academic persistence and graduation, particularly for BIPOC students (Solórzano et al., 2000).
For example, research demonstrates that higher perceptions of negative campus racial/ethnic climate have been linked to lower GPAs and rates of college satisfaction for BIPOC students (Fischer, 2007; Park, 2009). In addition, negative perceptions of campus racial/ethnic climate can derail academic progress towards graduation and have been associated with delayed graduation and leaving college prematurely (Fischer, 2010). Moreover, research indicates that feelings of prejudice or alienation are negatively correlated with the quality of BIPOC students’ academic experiences in college and their commitment to degree completion (Loo & Rolison, 1986; Muñoz, 1987; Museus et al., 2008; Suen, 1983). Further, a negative campus racial/ethnic has been identified as a significant contributor to the attrition rate of African American students (Eakins & Eakins, 2017).

Conversely, for BIPOC students, a positive university environment is central to their persistence in college (Bennett, 1995), particularly among those attending PWIs (Hurtado & Ponjuan, 2005). Furthermore, research suggests that a positive racial/ethnic climate can facilitate and lead to positive academic outcomes (Solzórzano et al., 2000). For example, Llamas et al. (2019) found that a more positive campus racial/ethnic climate predicted higher GPAs for BIPOC students. Further, research demonstrates that culturally engaging environments explain a significant portion of the variance in sense of belonging for BIPOC students, which is linked to increased intention to persist to graduation (Museus et al., 2018). This finding is consistent with Smedley et al. (1993) account that indicates that experiencing negative racial interactions may amplify feelings of not belonging at the institution and compound the negative effects of other existing stressors.

Although colleges and universities have been successful at increasing diversity, equality in graduation rates among students from different races/ethnicities remains elusive. Numerous
explanations have been proposed to account for the lower performance of BIPOC students, such as prior academic preparation (Elliott et al., 1996; Rask, 2002; Russell & Atwater, 2005), yet a plausible explanation is negative racial experiences (Museus et al., 2008). Furthermore, research suggests that mitigating negative racial experiences may go a long way toward reducing disparities between racial/ethnic groups in college outcomes, such as graduation rates (Fischer, 2009).

In the current study, I examined how a mentor (predictor) interacted with the mentee’s negative racial experiences (outcome). During the focus group, participants were asked if they had ever discussed negative racial experiences with their mentor. This question revealed if students had ever encountered negative racialized experiences and what effect, if any, did discussing it with their mentor had.

**Imposter Syndrome.** The imposter phenomenon, also known as imposter syndrome, refers to an internal feeling of intellectual phoniness that high-achieving students often experience (Clance & Imes, 1978; Ewing et al., 1996). Individuals who suffer from imposter syndrome doubt their accomplishments and have an internalized fear of being exposed as a fraud. When experiencing imposter syndrome, individuals cannot internalize their earned successes and are likely to attribute academic success to external factors (e.g., luck, physical attractiveness) (Harvey & Katz, 1985). Despite evidence that they are accomplished, those who experience imposter syndrome nevertheless live in fear of being exposed as incompetent as they enter into new endeavors professionally or otherwise (Clance, 1985; Clance & Imes, 1978).

The academic environment presents itself as fertile ground for the development of imposter syndrome. It appears that being faced with achievement tasks and situations, as students often are, triggers the feelings of intellectual phoniness that characterize imposter syndrome.
(Thompson et al., 1998). This issue within academic environments is especially important because imposters may be less likely to achieve their full potential because their fears prevent them from aiming as high as their potential (Kumar & Jagacinski, 2006).

Research demonstrates that imposter syndrome is common among Black, Asian American, and Latinx college students (Cokley et al., 2013; Cokley et al., 2017; McClain et al., 2016). Several factors may predispose BIPOC students to imposter syndrome during their educational experiences, including lack of adequate financial aid, the need to work to support themselves in school, racial discrimination, enduring negative stereotypes, and being the first in their families to pursue advanced education (Cokley et al., 2013; Ewing et al., 1996).

Intense feelings of imposter syndrome can interfere with the academic development of high-achieving BIPOC students (Ross et al., 2001). For example, imposter syndrome often causes BIPOC students to (a) compare themselves to their peers, (b) feel underqualified, (c) attribute their leadership roles to their race rather than to their abilities, (d) exhibit an unhealthy pressure to succeed, and (e) disengage from their academic endeavors (e.g., attending class, limiting campus activities) (Peteet et al., 2015; Ross et al., 2001; Sherman, 2013).

Research indicates that imposter syndrome negatively impacts the successful completion of academic goals (Ramsey & Brown, 2017). Chapman (2017) suggests that mitigating the effects of imposter syndrome is crucial for retention in school. Additionally, Leon (2020) suggests the negative impact of imposter syndrome may be a challenge that is contributing to low college graduation rates amongst Latinx students. Finally, in a study of indigenous students in Australia, researchers found that imposter syndrome negatively affected their ability to persist in their studies (Schwartz, 2018).
In the current study, I examined how a mentor (predictor) interacts with the mentee’s level of imposter syndrome (outcome). I asked participants if they ever felt like a fraud or imposter as a student or in their major and how their mentor changed their views.

**Contribution of Faculty**

**Faculty Diversity.** Despite the decades-long call for increased faculty diversity, the empirical research supporting why greater faculty diversity is vital for BIPOC students is limited. However, most research has demonstrated a positive association between overall campus faculty diversity and the graduation rates of BIPOC students (Gilmore, 2019; Stout et al., 2018). Moreover, in a study of public community colleges, Cross and Carman (2021) found a strong positive relationship between faculty diversity and graduation and transfer rates of BIPOC community college students. Similarly, Ogundu (2020) found a positive correlation between faculty diversity and the retention rate of African American full-time community college students.

When disaggregated by faculty race/ethnicity, student graduation rates are most strongly associated with the percentage of faculty at their institution of the same ethnicity/race (Cross & Carman, 2021). Similarly, prior research found that engineering departments that award more bachelor's degrees to Black women undergraduates are more likely to employ Black women faculty. Researchers also found this relationship among Asian Americans and Latinas (Main et al., 2020). Additionally, Fairlie et al. (2014) found that in a large university in California, an increase of BIPOC faculty by one standard deviation predicted a 1.5% increase in graduation rates for BIPOC students.

Evidence demonstrates that student-faculty racial/ethnic match (i.e., having a professor of the same ethnicity/race) positively influences BIPOC student academic outcomes. For example,
BIPOC students are less likely to drop a course and more likely to pass a course when having a racial/ethnic matched faculty instructor (Fairlie et al., 2014). These results indicated that the academic achievement gap between White and BIPOC students would decrease by hiring more BIPOC faculty (Fairlie et al., 2014). Moreover, Fischer (2010) found that college students reporting a higher number of same race/ethnicity professors had higher overall grades. Furthermore, Price (2010) indicated that Black students are more likely to persist in a STEM major if they have a STEM course taught by a Black instructor. However, a paucity of research examines the relationship between student-faculty racial/ethnic match and BIPOC student graduation rates.

Llamas et al. (2019) conducted a study that examined the effect of student-faculty racial/ethnic match on a sample of Asian, Latinx, and Black students. Llamas et al. (2019) found that having a student-faculty racial/ethnic match predicted higher grades, which, in turn, predicted students’ graduation rates. Furthermore, existing research confirms the importance of Black faculty, particularly regarding the retention of Black students attending PWIs (Dancy, 2011; Strayhorn, 2010). Researchers have also identified that same-race faculty mentoring contributes to Black male students’ success in higher education (Griffin, 2012). However, despite emerging evidence that student-faculty racial/ethnic match is positively related to BIPOC graduation rates, the literature explaining how it does so is extremely limited.

**Faculty Influences on Sense of Belonging and Possible Selves.** In a study focused on advancing diversity in higher education, the U.S. Department of Education (2016) found that it is important for students to see themselves reflected in the faculty and curriculum to which they are exposed to create a sense of belonging. Hausmann et al. (2007) argued for incorporating a sense of belonging as an important factor in models of student persistence. Moreover, research has
found that BIPOC faculty provide a sense of belonging (Hurtado et al., 2013; Ong et al., 2011), which positively affects graduation persistence (Hausmann et al., 2007). Research also indicates that BIPOC faculty facilitate possible selves in BIPOC students (Fincher et al., 2010; Rask & Bailey, 2002). Research suggests that facilitating possible selves positively relates to persistence (Delahunty & O’Shea, 2020).

Faculty Influences on Negative Racial Experiences and Imposter Syndrome. Faculty are influential in helping to shape a sense of belonging and establishing a climate for success and acceptance of all students within their classroom (Tinto, 2017). For instance, research indicates that students seek faculty diversity as an indicator of a positive campus racial/ethnic climate (Mayhew et al., 2005, 409). Moreover, Fischer (2009) suggests that, for BIPOC students, having same-race professors is one method to improve the campus racial/ethnic climate.

Further, Jones (2018) found that Black faculty listen empathically and provide suggestions concerning the management of imposter syndrome for Black students. That is, BIPOC faculty may help mitigate a negative campus racial/ethnic climate and imposter syndrome amongst BIPOC students (Alexander & Moore, 2008; Karkouti, 2016), and this is critical to improving their retention (Chapman, 2017) and graduation rates (Fischer, 2010; Llamas et al., 2019).

Although the effect of student-faculty ethnic-racial match on BIPOC graduation rates is vital to address for several reasons, a better understanding of the racial/ethnic dynamics between students and faculty could suggest policies and practices that improve current recommendations to recruit BIPOC faculty more ambitiously (Dee, 2004). Specifically, understanding how BIPOC faculty affect BIPOC students’ sense of belonging, possible selves, campus racial/ethnic climate, and imposter syndrome is critical. This, in turn, may also increase persistence, and intent to
graduate suggesting new approaches that challenge what makes an effective faculty member and mentor.

**Faculty Mentorship.** Within academia, “mentoring” and “advising” are often used interchangeably. However, several characteristics of these two types of relationships differentiate them. Advisors tend to be assigned, whereas mentoring relationships develop more organically and are informally initiated at the mentee’s request (Fochtman, 2006). Advising relationships are more time-limited (i.e., likely to end once the advisee graduates) and structured than mentorships, which commonly persist beyond formal training and typically are located within the student’s program. Conversely, mentors may be found even in unrelated disciplines (Johnson, 2007; Schlosser et al., 2011).

Mentoring can be formal or informal (Dutton et al., 2017). Formal mentoring programs are planned, structured, and coordinated interventions within an organization’s human resource policies (Ehrich, 2004). Additionally, formal mentorships are more likely to be of shorter duration and focused on defined goals (Ragins & Cotton, 1999). On the other hand, informal mentoring tends to be more unstructured and includes both career preparation and psychosocial support (Jones, 2018). Comparison studies generally support the notion that informal mentorships are viewed—by mentors and mentees—as more effective and consequential to both career and personal development, as they tend to offer greater levels of psychosocial support (Fagenson-Eland et al., 1997; Johnson, 2002; Ragins, & Cotton, 1999). In addition, psychosocial support, such as encouragement, friendship, and advice and feedback on performance (Kram, 1985), has been identified as a positive outcome of mentoring for mentees.

Research indicates that mentoring is critical for BIPOC students (Bordes, & Arredondo, 2005; Castellanos et al., 2016). In a study of 238 BIPOC students, Castellanos et al. (2016) found
that students who reported having a mentor experienced higher cultural fit (i.e., cultural congruity in combination with a perception of the university environment), more mentoring, and higher college and life satisfaction than students without a mentor. Alvarez and colleagues (2009) argued that to effectively mentor BIPOC students, faculty must engage in intentional self-exploration and education around issues of culture and academia, shared and assumed belief systems, and race/ethnicity issues (including discrimination and self-awareness). They must also navigate the dynamics of the relationship and interpersonal process between mentor and student (Alvarez et al., 2009).

Although same-ethnicity/race mentors are not necessary to ensure student success (Blake-Beard et al., 2011), graduate students do report valuing and seeking out same-race/ethnicity mentors (Barker, 2011; Guiffrida, 2005). Jones (2018) reported that this is likely to occur after national race-related events. There is also evidence that student-faculty racial/ethnic match may benefit student outcomes. Reddick (2011) analyzed the experiences of Black faculty at an elite U.S. university that mentored Black undergraduates. The findings indicate that faculty members’ shared cultural background enhanced their mentoring relationships, and faculty worked hard to establish trust with their mentees, absent at times in mentees’ relationships with White faculty (Reddick, 2011). Further, Black male students, in particular, noted that Black faculty helped them persist in academia (Brooms & Davis, 2017). Jones (2018) found that Black students expressed that BIPOC faculty offer a safe space to voice anxieties.

Studies suggest that White mentors serving as supportive allies for BIPOC students may sometimes be less helpful (Perrin et al., 2013). Some White mentors may attempt to insert themselves into dialogues or spaces meant for BIPOC only. These *counterspaces* are where BIPOC students gather to provide one another support that is free of the fear of racial/ethnic
backlash or that is meant only for individuals with similar ethnic/race backgrounds. The insertion of White individuals into these counterspaces can reduce feelings of safety, despite the likely positive intentions. According to Brown and Ostrove (2013), allyship consists of supporting minoritized groups through meaningful relationships and taking concrete action to dismantle inequitable systems. However, Jones (2018) suggests that White mentors must recognize the limitations of allyship. The proposed study examined student-faculty racial/ethnic match within the context of mentoring relationships.

**Theoretical Frameworks**

This study utilized Tinto’s Interactionalist Theory of College Student Departure (1993) and Yosso’s Community Cultural Wealth Model (CCW, 2005). Tinto’s (1993) model focuses on the individual and how the student must adapt to the cultural norms and values of the university. As a result, scholars have noted that the foundations of the theory are inflexible and do not consider the significance of the representation and culture of BIPOC students (Museus, 2014). Therefore, we utilized the CCW (Yosso, 2005) as an additional framework. The model is a culturally inclusive framework that challenges deficit perspectives troubling BIPOC students in higher education and considers various assets BIPOC students bring to the university.

**Tinto’s (1993) Interactionalist Theory of College Student Departure**

The prominent framework emerged in 1975 with Vincent Tinto’s sociological model of the college departure process. Tinto’s model (updated in 1993) is distinguished as one of the “most studied, tested, revised, and critiqued in the literature” (Braxton & Hirschy, 2005). Academics may use different variables to measure the model’s primary constructs (i.e., academic and social integration). Still, it is widely accepted that academic success is a process in which the individual takes on the student’s identity and becomes integrated into the collegiate environment.
College students’ academic success can be generally interpreted as learning and development, or more concretely, student retention and persistence to graduation. Tinto’s (1993) interactionalist theory of college student departure links student-faculty interaction to college student success. This theory suggests that student persistence results from students’ meanings of their interactions with others in college. That is, student characteristics influence their educational goal commitments and institutional commitments. As a result, these commitments influence students’ integration, performance, and involvement in social and academic domains. Academic and social integration impact the refashioning of student goals and commitments and, ultimately, their decision to persist to degree completion. Social integration includes peer and faculty interactions and captures the extent to which students feel comfortable in the college environment, with more substantial support for social integration as a predictor of persistence than academic integration (Braxton et al., 1997). Student-faculty interactions fall squarely under this conception of social integration and consequently relate to the most effective and uncomplicated form of student success, graduation.

Yosso’s Community Cultural Wealth Model (CCW, 2005)

A limitation of Tinto’s (1993) model is that it focuses on the individual and how the student must adapt to the cultural norms and values of the university. However, this can be difficult when applied to BIPOC students who may experience prejudice and discrimination, impacting their ability to integrate into their social and academic environment (Fischer, 2010; McClain et al., 2016; Museus et al., 2008). These experiences can create an adverse racial/ethnic climate that seeps through student campus interactions (Tinto, 1993). Moreover, Museus (2014) suggests the Interactionalist model exceedingly disservices BIPOC students who are more likely to come from cultures and communities different from those found on college campuses.
Research indicates that the model fails to account for positive attributes students bring to the campus (Yosso, 2005). Crisp et al. (2015) suggests new research should consider the cultural capital of BIPOC students in their framework. Accordingly, we utilize the CCW (Yosso, 2005) that challenges the deficit outlooks of communities of color and considers the assets BIPOC students bring to the campus.

The CCW identifies and documents cultural wealth to empower BIPOCs to utilize assets in their communities (Yosso, 2005). The model employs a framework that acknowledges BIPOC students’ capacity to transfer the knowledge, skills, and abilities learned at home into the academic environment (Yosso, 2005). The CCW opposes deficit-based definitions of cultural capital that often devalue communities of color. Instead, this model offers an asset-based perspective that suggests BIPOC students have the assets and means needed to graduate from college.

The CCW (Yosso, 2005) emphasizes six forms of cultural assets that include social, aspirational, linguistic, familial, navigational, and resistant forms of capital. Aspirational capital is the ability of BIPOC students to maintain hope for their dreams and opportunities even in the face of opposition or lack of resources. Linguistic capital consists of the social and intellectual skills acquired through using multiple languages or communicating in multiple ways. Social capital refers to the people and community networks instrumental in providing information on navigating social institutions. Familial capital derives from cultural knowledge formed among families and community networks, enhancing the BIPOC student experience. Navigational capital refers to the ability to maneuver through social structures that were not necessarily created to facilitate BIPOC student success. Finally, resistant capital refers to skills developed through behaviors that oppose and challenge systemic inequalities. These cultural assets are
essential to BIPOC students’ academic success (Yosso, 2005). These six forms of capital “are not mutually exclusive or static, but rather are dynamic processes that build on one another” (Yosso, 2005, 77).

The CCW (Yosso, 2005) argues that BIPOC students have cultural assets before entering a college environment that contributes to their success. The current study examined how student-faculty interactions affect BIPOC graduation rates and assets that assist with persistence.

Purpose

The current study examined how BIPOC faculty affect BIPOC students’ sense of belonging, possible selves, negative racialized experiences, and imposter syndrome, which may increase persistence and intent to graduate. Research demonstrates these four mechanisms affect retention and graduation rates amongst BIPOC students. In addition, the current study utilized Tinto’s (1993) interactional theory of college student departure, which underscores the effect of student-faculty interactions.

Research Questions

Three research questions guided this study: (1) How do BIPOC faculty foster a sense of belonging to BIPOC undergraduate students compared to non-BIPOC faculty? (2) How do BIPOC faculty facilitate possible selves in BIPOC undergraduate students compared to non-BIPOC faculty? (3) How do BIPOC faculty help mitigate a negative racialized experiences and imposter syndrome in BIPOC undergraduate students compared to non-BIPOC faculty?
Methods

Participants

The study examined BIPOC undergraduate students at a public 4-year institution. Students were recruited by requesting instructors from various disciplines to announce it during their lectures and asking undergraduate research training program directors to disseminate the flyer with their listserv. Also, flyers were posted around the campus in settings where students typically congregate, such as the library and bookstore.

Inclusionary criteria. Participants were recruited based on the following criteria:

1) Student must be a current undergraduate at [public 4-year institution in Southern California].
2) At least a second-year student at [public 4-year institution in Southern California].
3) Student must report having a mentor for at least one year.
4) Student must indicate whether or not they have a student-faculty racial/ethnic match.
5) Student must identify as BIPOC (i.e., Black, Latinx, Native American/Pacific Islander, and Asian American descent).

The fulfillment of the criteria was determined using a self-report pre-screen survey.

Nineteen individuals currently enrolled in the university were invited to participate in one of four focus groups. One student later revealed they were white, so they were omitted from all analyses, and the sample was 18. In the sample of 18 participants, 9 reported a student-faculty racial/ethnic match and 9 reported a nonmatch. Focus groups consisted of individuals that belonged to the same group (match vs. nonmatch).
Of the 18 participants, 14 identified as Latinx or Hispanic, three Asian, and one African-American, with a mean age of 23.3 years. Seven reported majoring in a biological science or chemistry, six participants in Psychology, two in media and communication, one indicated education, one in public health, and one in engineering. Ten students reported their faculty mentors were full professors, three associate professors, one assistant professor, and four lecturers or instructors. 

**Study Design**

The proposed study utilized a mixed-methods approach. A total of six focus groups were administered, with 3-4 participants in each focus group. All interviews were conducted in English. Three focus groups consisted of students reporting a student-faculty racial/ethnic match, and the other three focus groups consisted of students reporting a nonmatch.

**Context Setting.** The current public 4-year institution in southern California is one of 23 public university campuses of the California State University system. In the Fall of 2021, the university had an undergraduate population of nearly 34,000, of which 71% were BIPOC (CSUN, n.d.). Moreover, 27.7% of all faculty members are from BIPOC backgrounds (CSUN, n.d.). However, it is worth noting that faculty do not match the student demographics. For example, undergraduates are 57% Latinx, but only 11.6% of all faculty are Latinx. Therefore, students may be able to find a BIPOC mentor, however, they will not be matched.

**Procedure**

Due to COVID-19, all facets of the study were conducted online, and various university communications (i.e., paper flyers, in-class announcements, and electronic mailing lists) were used to recruit participants.
All advertisements and announcements contained a link that directed participants to a pre-screen survey. The link directed participants to a survey administered on Qualtrics. Announcements communicated that eligible participants would be compensated for their time.

Participants completed a pre-screen survey to assess whether or not they were eligible to participate in the study. The survey consisted of demographic questions such as name, age, ethnicity, enrollment status (e.g., undergraduate), expected graduation, and field of study. An additional question asked if their mentor was from the same racial/ethnic background. Participants chose from a list of potential times and days to participate in the focus group. The pre-screen survey took less than 10 minutes to complete.

After completing the pre-screen survey, participants were notified within 72 hours whether or not they were eligible to participate. Eligible participants were then contacted, provided more information about the study, a digital consent form, a time and day for the focus group, and a Zoom link.

All focus groups were conducted via Zoom. The focus groups lasted approximately 40 to 60 minutes. The average length of focus group for matched groups ($M = 51$ mins) was longer than nonmatched groups ($M = 33$ mins). The focus groups consisted of 3-4 participants. Three focus groups were comprised of students reporting a student-faculty racial/ethnic match, and three were nonmatch. See Appendix A for the focus group questions. At the conclusion of each focus group interview, the participants were directed to complete a post-focus group survey assessing the following constructs: sense of belonging, academic possible selves, negative racial experiences, and imposter syndrome. The post-focus group survey took between 15 to 25 minutes to complete. Finally, once the participants completed all aspects of the study, they received an email thanking them for their participation with a link to a $25$ Amazon e-gift card.
Measures

The pre-screening survey consisted of 14 items, including demographic questions and a question regarding mentor racial/ethnic match (see Appendix A). The focus group interview protocol consisted of six questions, and follow-up prompts regarding students’ sense of belonging, academic possible selves, negative racial experiences, and imposter syndrome (see Appendix B). The focus group protocol questions included one question regarding their sense of belonging, two questions about possible selves, one question about negative racial experiences, and one question about imposter syndrome.

The post-focus group survey consisted of a series of four published assessments. Specifically, I collected quantitative data on students’ perception of sense of belonging, academic possible selves, negative racialized experiences, and imposter syndrome (see Appendix C).

**Sense of belonging.** Sense of belonging was measured using a three-item factor; Cronbach’s alpha = 0.84 (Chang, 2011; Hurtado, 2011). All items were on a four-point Likert scale: 1 = strongly disagree to 4 = strongly agree. A sample item included, “Think about your experience at [university]. I see myself as part of the campus community.”

**Balanced academic possible selves.** Balanced academic possible selves were assessed using open-ended probes in a previously developed script by Oyserman and colleagues (Oyserman and Markus, 1990a, b; Oyserman & Saltz, 1993). Participants were asked to generate three academic possible selves in response to each of two probes: “Think about your future academic/educational goals. What are some of your expectations? Next year, I expect to be…” and “Think about your future academic/educational goals. What are some things you want to avoid? Next year, I want to avoid being…” Content analysis, a descriptive approach to coding
the data and its interpretation of quantitative counts of the codes, were employed (Downe-Wamboldt, 1992; Morgan, 1993). According to Oyserman and Markus (1990a, b), a pair of responses (an expected and a feared self) was considered “in balance” if the expected self and the feared self represented a positive and a negative aspect of the same domain. Therefore, I read the open-ended expected and feared academic possible selves and counted the number of times students described school-focused goals (e.g., expected: in a graduate program, feared: failing a class). Each respondent received a score from 0 (no balance) to 3 (balance in each of the three possible pairs of expected and feared selves). Research shows that individuals with a balance between their expected and their feared selves in a given domain should have more motivational control over their behavior in this domain because they have more motivational resources than individuals without such balance (Oyserman and Markus, 1990a, b). Thus, this method captures the participants’ motivational focus needed to engage in institutional commitments rather than other activities.

**Negative Racialized Experiences.** Students were asked four questions regarding their negative racial experiences as measured by Chang et al. (2011), Cronbach’s alpha = .72. The first three items were measured on a five-point Likert scale: 1 = never to 5 = very often. The last two items were measured on a 4-point scale: 1 = strongly disagree to 4 = strongly agree. A sample item included, “Have you heard faculty express stereotypes about racial/ethnic groups in class?”

**Imposter Syndrome.** The Clance Impostor Phenomenon Scale (CIPS; Clance, 1985) is a 20-item measurement scale that evaluates an individual’s level of impostor syndrome. All items were measured on a five-point Likert scale: 1= Not at all true; 5 = Very true. The CIPS has strong internal consistency (Cronbach’s α = .92) and acceptable test-retest reliability (r = .72). Furthermore, the CIPS is the preferred test in research because it is shorter in length, which
allows it to be administered more easily (Chrisman, Pieper, Clance, Holland, & Glickauf-Hughes, 1995). A sample item, “I can give the impression that I’m more competent than I really am.”

**Positionality**

I am a person of color, the son of undocumented parents, raised in an impoverished neighborhood. As a first-generation undergraduate college student, all of my psychology professors and mentors were White, which sparked my interest in this study and familiarity with the importance of a student-faculty racial/ethnic match. My journey navigating through college as an undergraduate and becoming an emerging scholar has been exceedingly difficult. I constantly questioned my ability to succeed in psychological research because I had never met a person of color who had done so. I routinely doubted my identity as a researcher, and my collectivist mindset always seemed to clash with my research labs’ individualistic academic objectives.

Moreover, I was an unhoused college student. Although well-intentioned, my White mentors were incapable of making me feel like I belonged—let alone empowering me to envision a world beyond my present circumstances. In this research project, I recognize the bias of not having a mentor whose ethnicity matched my own until graduate studies. Nevertheless, I positioned myself in a way that readily and openly identified how students differed in the benefits they obtained from their faculty relationships.

**Analysis Plan**

All focus groups were audio-recorded and fully transcribed verbatim. Data analysis of verbatim transcriptions was conducted using thematic analysis - a method for identifying, analyzing, and reporting patterns (themes) within data. It minimally organizes and describes a
data set in rich detail. However, it frequently goes further than this and interprets various aspects of the research topic (Boyatzis, 1998).

Researchers can identify themes or patterns within data in one of two primary ways in thematic analysis: in an inductive or ‘bottom up’ way (e.g., Frith & Gleeson, 2004), or in a theoretical or deductive or ‘top down’ way (e.g., Boyatzis, 1998; Hayes, 1997). The current study utilized deductive thematic analysis (TA), which tends to be driven by the researcher’s theoretical interest in the area and is, therefore, more explicitly analyst driven.

TA needs to be underpinned by theory, similar to interpretative phenomenological analysis and grounded theory (Harding & Whitehead, 2013). Still, the researcher must choose the theories that inform their use of TA, and how they perform thematic analysis (McLeod, 2015). Therefore, verbatim transcripts were reviewed, coding for mechanisms (i.e., possible selves, sense of belonging, possible selves, negative racialized experiences, and imposter syndrome) related to the research questions. Tinto’s (1993) model was used to identify students’ perceptions of relationship/interactions with faculty. Moreover, Yosso's six forms of community cultural wealth (2005) were used to draw attention to the cultural assets BIPOC students have within the college environment. Although theoretical thematic analysis led to a less detailed description of the data overall, it provided a more detailed analysis of the research questions.

Transcriptions were individually read three times by the first author, who created an initial codebook. Frequencies across codes were calculated. Two researchers (a graduate student and an undergraduate research assistant trained in qualitative methods) used the original codebook to code the transcripts independently (Boyatzis, 1998). Then, the researchers met to discuss the codes that emerged within each focus group and agree on the most prominent themes. Themes were generated using codes that connected the research questions to the statements.
found in the data. Themes were considered significant when they contained at least five codes (see Appendix D). The final codebook contained five themes and 40 subcodes. Identity was a common theme that emerged that was not one of the original mechanisms.

In the results section, excerpts of the responses were used to illustrate the themes and subthemes that emerged. Pseudonyms for participants were used to assure anonymity and any potentially identifying information was changed. To effectively demonstrate a theme, sometimes the discourse of an individual participant was edited to eliminate irrelevant details; these omissions are indicated by multiple dots (i.e., . . .). Commas or semicolons were used to chunk a statement and make its meaning more straightforward. Brackets were used in discourse material if something seemed to be missing.
Results

Quantitative Analyses

This study sought to understand undergraduate mentees’ perceptions of faculty and how their mentoring relationships impacted the mechanisms influencing their persistence. These mechanisms include possible selves, sense of belonging, racialized experiences, and imposter syndrome. Specifically, the research questions examined how faculty racially/ethnically matched with their students affect these mechanisms in BIPOC students compared to faculty not matched with students. To analyze the effect of student-faculty racial/ethnic match, mentees were given follow-up prompts for each of the mechanisms. Table 1 presents the mean, standard deviations, independent samples t-test results, and effect sizes on the mechanisms for racially/ethnically matched and nonmatched students. Independent samples t-test of mechanisms influencing BIPOC graduation rates did not reveal a significant difference between mentees that indicated a match and those that indicated a nonmatch.

Table 1

<table>
<thead>
<tr>
<th>Mechanisms</th>
<th>Match M</th>
<th>Match SD</th>
<th>Match N</th>
<th>Nonmatch M</th>
<th>Nonmatch SD</th>
<th>Nonmatch n</th>
<th>95% CI for Mean</th>
<th>T</th>
<th>df</th>
<th>Cohen’s d</th>
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<tr>
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<td>.59</td>
<td>9</td>
<td>3.44</td>
<td>.44</td>
<td>9</td>
<td>-.445, .593</td>
<td>.766</td>
<td>16</td>
<td>.519</td>
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<tr>
<td>BAPS</td>
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<td>.72</td>
<td>9</td>
<td>2.56</td>
<td>.53</td>
<td>9</td>
<td>-.523, .745</td>
<td>.371</td>
<td>16</td>
<td>.634</td>
</tr>
<tr>
<td>NRE</td>
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<td>.72</td>
<td>9</td>
<td>1.92</td>
<td>.64</td>
<td>9</td>
<td>-.047, .85</td>
<td>.611</td>
<td>16</td>
<td>.281</td>
</tr>
<tr>
<td>CIPS</td>
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<td>.6</td>
<td>9</td>
<td>3.34</td>
<td>.6</td>
<td>9</td>
<td>-.076, .41</td>
<td>-.636</td>
<td>16</td>
<td>-.292</td>
</tr>
</tbody>
</table>

SOB = Sense of belonging, BAPS = Balanced academic possible selves, NRE = Negative racialized experiences, CIPS = Clance imposter phenomenon scale
Qualitative Analyses

The research questions of interest in this study sought to understand students' perceptions of faculty and how they impacted their persistence. Deductive (i.e., theoretical) thematic analysis was used to analyze these data and create themes that emerged based on patterns in the focus groups. The first step included developing codes that captured how mentors affect mentees’ possible selves, sense of belonging, racialized experiences, and imposter syndrome while considering Tinto's (1993) model. Moreover, the CCW model (Yosso, 2005) was used to draw attention to BIPOC students’ cultural assets concerning factors affecting their persistence. After codes were created, themes were developed. For each of the mechanisms (sense of belonging, possible selves, negative racialized experiences, imposter syndrome), the themes that emerged are described and illustrated using the participants’ voices. Pseudonyms for participants were used to assure anonymity.

Sense of Belonging

Participants described four themes that affected their sense of belonging, including a) their mentors offering professional development opportunities, b) mentors providing emotional support, c) mentors providing counterspaces, and d) how diversity facilitated a sense of belonging. In line with Tinto’s (1993) model, the mentees’ academic characteristics influenced their engagement with their education. Tinto’s (1993) model suggests this engagement affected their faculty interactions, which ultimately impacts mentees’ persistence.

Professional development. All ten student-faculty racial/ethnic matched participants reported that their mentors provided professional development opportunities. Moreover, eight of nine nonmatched students reported that their mentors also provided professional development opportunities. Alejandra, a Latinx student, who was student-faculty racial/ethnic matched, noted
that her mentor facilitated a sense of belonging by providing professional development through networking. She stated, “For me, it has to go back to networking…And also like incorporating other people into it because we meet many people. Whether it's joining somebody else's lab momentarily, to work on a project together, or something. That also helps. I've met a lot of people like that, which I think is my main thing that I'm appreciative of him for.”

Similarly, Manuela, a Latinx student, student-faculty racial/ethnic matched, discussed her mentor, “He does weekly meetings with other students where we just share what’s going on with our classes, do we need any tutoring... And that has really helped me because he makes me have a connection with other [university] students.”

According to Yosso (2005), Manuela demonstrates social capital and navigational capital by creating connections with peers that will help the professional development that she needs to persist in her studies.

Akin to ethnic/racial matched students, nonmatched students also described their mentors providing them with professional development opportunities. For example, Andrea, a Latinx student, a racial/ethnic nonmatch with her mentor, who is a White male, said, “Based on our mentorship, we have to attend workshops and events, so definitely having him send me, ‘Are you interested in this?’ or ‘Hey, this is something similar to what you want to do. Let's go check it out.’ If it's in person, we'll meet up there. So, I think just making those events more approachable.”

And Isabel, a Latinx student, racial/ethnic nonmatch with her mentor, a White male, stated, “The things that my mentor has done to connect me to the community on campus is mostly suggesting what kind of clubs I should join. Most of them are related to my major. He's
also asked me to be a panelist or judge for certain poster conferences. He helps me with my 
resume and with those things.”

Maria, a Latinx student, racial/ethnic nonmatch with her mentor, who is an Asian- 
American male, said:

For me, I don’t know if he's really helped much, but introducing me to other stuff on 
campus like he'll invite me to talks on Zoom. But they're more with some [university] 
students attending but it's being hosted by people from the University of California (UC), 
or he'll host talks but it's more just listening to the people from UC's talk. It's not like 
we're going to mixers with other [university] students that I'm aware of or anything like 
that. So, it's really just the people in our lab and then that's about it.

**Emotional Support.** Less common, was the theme of faculty mentors providing students 
emotional support. Five racial/ethnic matched and two racial/ethnic nonmatched participants 
reported that their mentors also provided emotional support. Pablo, a Latinx student, student-
faculty racial/ethnic matched, described how his mentor facilitated a sense of belonging by 
supporting him with professional development and providing emotional support.

I think that my mentor has reinforced my identity not only in academics, but in my 
personal life as well. He's very accepting in all areas. So, I'm openly gay, and so I could 
have conversations about my partner with him. He's very accepting, so not only is he 
there to guide me academically, but also to give me advice more on the personal level. 
So, I think that's also nice from him.

According to Yosso (2005), Pablo demonstrated social capital by establishing a 
relationship that would help him do well academically and seeking emotional support to 
facilitate his persistence.
Similarly, Kevin, an Asian-American student, student-faculty racial/ethnic matched, noted that his mentor facilitated a sense of belonging by providing emotional support. “I transferred to [university] during lockdown. There was definitely a part of me that didn't expect to be really involved in the campus culture or just much of the campus programs. …but what I really appreciate is being brought on campus for weekly meetings … and to come together during certain holidays and form a nice camaraderie. And that has—all of this has made me feel like a [university] student, and that's the best way to describe it.”

According to Yosso (2005), Kevin demonstrates social capital by creating relationships with peers and connections that will help his professional development while realizing that some of these relationships will facilitate the emotional support he needs to persist in his studies.

Diego, a Latinx student, nonmatched with his mentor, an Asian-American male, noted that his mentor facilitated a sense of belonging by providing him with emotional support. Diego mentioned, “[My mentor] also supported me in emotional—emotional struggles. Whether I'm having a tough time or whether I'm feeling overwhelmed. He's like, ‘it's always okay to take a step back and then just relax and rest your mind, and then just approach it differently or just approach it whenever you're ready.’”

According to Yosso (2005), Diego demonstrates social capital by establishing relationships that are essential to his professional development and providing the emotional support to facilitate his persistence.

**Counterspaces.** While less common, the theme of counterspaces emerged in both groups of students. Counterspaces are spaces built and maintained by minoritized individuals to find support and develop survival strategies in unwelcoming social environments (Solorzano & Yosso, 2001; Yosso, 2013; Yosso & Lopez, 2010). Six student-faculty racial/ethnic matched
participants and one nonmatched participant reported that their mentors provided counterspaces. Jada, an African-American student racial/ethnic matched stated, “Certain things that I'm being taught by my mentor, I can get an understanding of why I am the way I am. Why I parent the way I parent. It validated a lot of my feelings, and then I got a grasp of other things that I wanted to incorporate in my life. I just feel like it made me stronger as a person. Just learning new things from someone who's experienced it as well. It made me stronger as a person.

Gabriel, a Latinx student, racial/ethnic matched stated:

Well before this advisor, I had found a mentor during the lockdown. I had a research idea and he didn't really like it. And the research idea was on stereotype threat. When I proposed my study—he's a cis-gendered white male—he told me that he didn't think that stereotype threat was a valid theoretical framework... I was interested in race and stereotype threat during Zoom, like in the online environment. And he just gave me the runaround and said maybe you should try something different. So, when I met my advisor, I told him about it... It just felt weird for a white person to be telling me that race stereotype threat is not valid, and so that felt not discriminatory, but to me, it just felt ignorant. So, my advisor talked me through that.

Guadalupe, a Latinx student, racial/ethnic matched, noted, “[My mentor] makes me feel more like I belong. Like this is for me. Even though all of the people around me don't look like me or they don't know my experiences, I feel like she understands where I come from in terms of only speaking Spanish. Speaking Spanish was my first language. It's tapping into a whole different understanding of where you come from, like growing up.”

Yosso (2005) would argue that all of these examples illustrate faculty validating the students’ lived experiences and providing counterspaces – or safe spaces to exist. Whether it be
in their lab space or on campus, they get validation that it is okay to speak Spanish or allowed to study stereotype threat – a phenomena that is real and valid but had been discounted by the white mentor.

Diversity facilitates a sense of belonging. Four student-faculty racial/ethnic matched students reported that diversity facilitated a sense of belonging. Meanwhile, no nonmatched students discussed this topic. Guadalupe, a Latinx student, student-faculty racial/ethnic matched and an education major, described her experience at a school site where she was currently working.

For me, I shared earlier, I’m one of the only, like very few of us are Hispanic in my school currently. So, I do feel a sense of, “What am I doing here?” But my mentor has helped me realize that there’s a lot of us that are in this field that need to be there for one another and to support each other. And be the kind of person that’s understanding and doing that for someone else. So, obviously, right now, I have a mentor, but I'll someday be that support for someone else. And she helped me realize that we have to help one another and feel like we belong here so that there are more of us here. Because I feel like oftentimes a lot of us feel like, “Oh, it's mostly dominated by White females, like the school district.” But slowly and surely there's starting to be more teachers of color, and most of our students are of color so it's starting to make sense. Like okay, our teachers look like us and they understand us. And they know what we are going through.

According to Yosso (2005), Guadalupe demonstrated social capital, navigational capital, as well as resistant capital. First, she used her mentor as a source of strength in her current academic environment (social capital). She also drew on her mentorship to help her progress through an environment where White women mostly dominate (navigational capital). Moreover,
Guadalupe recognizing that a student-faculty racial/ethnic mentorship is essential for members of communities of color to succeed in spaces that do not facilitate BIPOC student success (resistant capital).

Alejandra, a Latinx student, student-faculty racial/ethnic matched, replied to Guadalupe’s comment, “I agree with something that Guadalupe spoke about, like feeling that she belonged. I agree with that because I'm surrounded by so many people of color, I feel like I do belong. Because if I'm in a setting where there are a lot of White people, I tend to feel like, ‘Oh, I don't belong here.’ So, the fact that I am surrounded and also with [undergraduate research training program], it just, it makes it more comfortable or more like I do belong here.”

According to Yosso (2005), Alejandra demonstrated navigational capital by acknowledging how a diverse academic environment facilitates a sense of belonging.

Adrian, a Latinx student, student-faculty racial/ethnic matched, reflected on how his mentor influenced his racial/ethnic identity, which was bolstered by a diverse campus community, “I think just the idea because [my mentor and I] are the same—has the same background in terms of race. So, it's been nice to understand. And understand like, okay, you're not alone here. You're not the only one. I mean, then again, it is [university]—it has a high percentage of Latinos, so being around that too was also helpful.”

According to Yosso (2005), Adrian demonstrated navigational capital by acknowledging how being surrounded by diverse peers facilitates a sense of belonging.

In sum, of the four themes that emerged within the mechanism of sense of belonging, two themes – professional development and emotional support – were common among both matched and nonmatched students. In contrast, counterspaces and diversity were more common themes that emerged with racial/ethnic matched participants, compared to nonmatched participants.
Possible selves

The participants were clear and consistent on how their mentors influenced their possible selves (i.e., future-oriented element of self-concept). Eight of the ten racial/ethnic matched and seven of the nine nonmatched participants reported that mentors influenced their graduate school pursuits, such as reinforcing their Ph.D. aspirations. This finding is consistent with Tinto’s (1993) model that suggests students’ academic identities influence their educational goal commitments, affecting their faculty interactions (i.e., social integration). The model suggests that social integration impacts students’ decision to persist to degree completion. Student-faculty racial/ethnic matched participants were more likely to state that the match helped them believe in what was possible for them in the future. However, this pattern was not observed in nonmatched students. Below are several examples of student-faculty racial/ethnic matched participants and whose mentor influenced them to pursue graduate school.

Pablo, a Latinx student, stated, “At the beginning of [undergraduate research training program], when I applied, I was hoping to have someone who could guide me and direct me to the right direction in academia. I’m a first-generation student, and my parents went up to some elementary school. So, I really didn't have anyone to tell me what programs existed and such. So, I really wanted a mentor who not only looked like me, but could also share the same background as me, and could guide me to graduate school, and that's the reason why I chose my mentor.”

According to Yosso (2005), Pablo represents social capital by seeking a mentor who shared his background and could provide information on navigating the academic environment. Moreover, Pablo demonstrates aspirational capital through his ability to maintain hopes for his graduate school ambitions, although he is a first-generation college student with parents that have minimal education.
Student-faculty racial/ethnic matched participants consistently stated that the match helped them believe in what was possible for them in the future. Gabriel, a Latinx student, student-faculty racial/ethnic matched, stated:

My mentor does a lot of research on mentorship, so he's all about cocreation because he does it from a critical race perspective. So, we kind of do everything on the same level, and it's been really good because it forces me to get comfortable with things I would've probably been uncomfortable with before. And I'm doing it alongside him and that's been a really good way for me to have faith in myself…and he's really all about making sure that we understand that what we're doing is quite possible no matter how old we are or what level we’re at in our education. He's really all about doing it together, and that's been really helpful…he's a person of color, and he's a lot like me. So, I think seeing him in that field and doing what he's doing made me believe that it's also possible for somebody who looks like me and is like me. So, it's pretty affirming, I would say.

Similarly, Jada, an African-American student, student-faculty racial/ethnic matched, echoed Gabriel’s comments. “Yeah, I totally agree with that. Because when you don’t see someone like you doing something, it seems so out of reach. But then you see people within your community or who you relate to doing it, and it gives you self-confidence, ‘Okay if she could do it, I could do it too.’ So, yeah, it was reassuring that is true.” Furthermore, Kevin, an Asian-American student, student-faculty racial/ethnic matched, agreed. “My mentor is also a person of color, and a lot of the mentees that I've gotten to know are very diverse, and just seeing them all in the discipline working—it has only made it feel more approachable and more tangible. I've gotten to see myself in their shoes, and it's helped me understand my position and my future position in the field.”
According to Yosso (2005), Gabriel, Jada, and Kevin all demonstrated social capital by maintaining relationships with faculty that would be influential and instrumental to their academic success.

In contrast to racial/ethnic matched participants, nonmatched participants also discussed how their mentors influenced their future possible selves. However, the comments never related to the race/ethnicity of the mentor as being a factor. For example, Isabel, a Latinx student, racial/ethnic nonmatched; with a White male mentor, noted that her mentor influenced her to pursue graduate school. She reports, “In high school, I wanted to be some sort of medical doctor, maybe a dermatologist. But when I entered [university], I was majoring in molecular and cellular biology. And after meeting my mentor, I definitely enjoyed doing research. So, I want to continue doing research and apply to graduate school.”

Similarly, Sam, an Asian-American student, racial/ethnic nonmatched with a Latinx male mentor, expressed that her mentor reinforced her Ph.D. aspirations, “Before I met my mentor, I never expected myself to like microbiology research… and he's [mentor] doing microbio research. I think before [undergraduate research training program] and my mentor, I did consider a career in Ph.D. So, I think after mentoring… it really changed my career prospects as well as academic goals of wanting to pursue a Ph.D. in microbiology and immunology.”

According to Yosso (2005), Sam represents social capital by seeking a mentor who could provide her with critical information to navigate such a rigorous academic environment and reach her Ph.D. aspirations.

In essence, most participants, matched and nonmatched, clearly outlined how their mentors influenced the mechanism of possible selves. Six racial/ethnic matched participants
described how the race/ethnicity of their mentor was a contributor to their possible selves compared to nonmatched participants that never made this association.

**Negative Racialized Experiences**

Less common, was the mechanism of students discussing negative racialized experiences with their mentors. Six of the nineteen participants (5 matched, 1 nonmatched) reported discussing negative racialized experiences with their mentors. Moreover, thirteen of the nineteen participants (5 matched, 8 nonmatched) reported that they have not discussed negative racialized experiences with their mentors. Adrian, a Latinx student, student-faculty racial/ethnic matched, illustrated a conversation with his mentor. “Not personal, but definitely based on what the community is like on campus. I don't want to say good or bad, conversations more like, ‘Okay here's how it is, here's how things roll for certain students, people of color or not people of color.’”

It is worth noting that several mentees indicating a nonmatch promptly and clearly reported that they do not discuss negative racial experiences with their mentor. For example, Santiago, a Latinx student, reported a nonmatch; his mentor was a White male. Santiago mentioned that his mentor reinforced his Ph.D. aspirations, influenced his scientific identity, and mitigated his imposter syndrome. When asked, “Have you ever discussed any negative racial experiences with your mentor?” his response to the question was, “I don’t know, it's weird. We don't really talk about stuff like that.”

By and large, most participants, matched and nonmatched, did not report discussing negative racialized experiences with their mentor.

**Imposter Syndrome**
Following Tinto’s (1993) model, participants reported how their mentors affected their imposter syndrome. The participants reported that conversations with their mentors were instrumental in mitigating their imposter syndrome. Thirteen of the nineteen participants (9 matched, 4 nonmatched) reported that their mentor mitigated their imposter syndrome. Manuela, a Latinx student, student-faculty racial/ethnic matched, described how her mentor mitigated her imposter syndrome.

I definitely feel like an imposter all the time. As a engineering student that is mostly dominated by men, and as a Latino student, there's not a lot of engineers that come from a Hispanic background. So, most of the time, I'm in the classroom and there's only one or two girls and most of them are not Hispanic. So, my mentor helped me realize that instead of seeing that as a bad thing to feel proud of myself because I'm one of the only ones that is able to achieve that. And that was difficult for me to realize in the beginning because I didn't know what was going on. If you see yourself as the only girl in the classroom, you're going to be like, “Am I doing something wrong? Why am I the only one here?” So, he helped me realize what was going on.

Sofia, a Latinx student, student-faculty racial/ethnic matched, described how her mentor mitigated her imposter syndrome:

I've actually attended a talk that my mentor held on imposter syndrome. And I really like the questions that the audience asked. Because it made her more relatable when she talked about her own experiences dealing with imposter syndrome. And how she dealt with her own insecurities and how every small victory really helped boost her confidence as a scientist because you can't win them all. And she helped me learn that I also had to accept my own failures as what they are and just to move on from that.
Jada, an African-American student, student-faculty racial/ethnic matched, also expressed that a conversation with her mentor mitigated her imposter syndrome.

So, I actually learned about imposter syndrome with my mentor. So, I was talking to her one day and expressing the way I feel about certain things and finishing school and going on to my master's program. And when I was voicing about the way I feel, she brought up imposter syndrome because I always doubt myself. … I always doubt myself, and I never really give myself credit where it's due. I don't see what I'm doing as anything great. When I'm doing something, I'm just doing it. I don't see it as anything better or that anybody else can't do. Or anytime I'm successful in something or I achieve something, I'm like, “Okay, yeah, whatever. I did it. There's nothing super extra good about it.” So, she was just telling me about that, and she was saying, don't be so hard on myself, to feel good about me doing things because everybody can't do what I've done for various reasons.

According to Yosso (2005), Jada represents social capital by making the most of her conversation with her mentor to overcome imposter syndrome.

Diego, a Latinx student, racial/ethnic nonmatched with an Asian-American male mentor. described that a conversation with his mentor mitigated his imposter syndrome:

Early on coming to [university], I expressed to [my mentor] how I didn't know if I was good enough to be a scientist. I didn't know if I was okay to be a scientist because there's not that many Latinos who are scientists that I know of. Then, he expressed his sympathies, and he's like, “Yeah, I know tons of Latino scientists and a bunch of scientists that share your similar background, and their great students that I've had who are great scientists that I know.” …Whenever there's a paper and somebody that shares a
similar racial background to me, he'll mention it to me, and he's like, “Oh, look what they
found in Peru.” …I'm Peruvian, half Peruvian—and then, “Look what I found.” And then
he always tries to make me feel like I do belong here.

According to Yosso (2005), Diego demonstrated resistant capital by engaging with
behaviors that mitigates imposter syndrome, helping him persist in the sciences and challenging
the lack of representation in the sciences.

Santiago, a Latinx student, racial/ethnic nonmatched with a White male mentor,
expressed that a conversation with his mentor mitigated his imposter syndrome:

A lot of the research programs that I applied for, I started seeing positions in February—
like mid-February. So, I applied to thirteen research programs. I got rejected from four
but accepted to nine. And the statistics, I don't know, they just seemed really surreal to
me. Because a lot of the institutions that I applied to were institutions like the University
of Utah, U of M, other institutions like that, MIT. When I got accepted, I genuinely felt
like they must've made a mistake. So, I did bring that to the attention of my PI. And as
soon as we started having the conversation, I just felt so reassured… He told me that he
has seen me grow so much over that time—time that we've known each other. And that I
shouldn't be feeling that way. He’s felt like that too. So, he would give me personal
anecdotes when he got accepted to Columbia and then Harvard. So, those similarities
really made me feel better about myself.

According to Yosso (2005), Santiago represents social capital by using his enduring
relationship with his mentor to overcome imposter syndrome.

In short, several participants described how their mentors mitigated the mechanism of
imposter syndrome, with most of these participants being a racial/ethnic match.
Identities

A common theme that emerged that was not one of the mechanisms, was the theme of identities. Identities are what come to mind when we think of ourselves (Neisser, 1993), including both personal and social identities (Stryker, 1980; Tajfel, 1981). Within the theme of identity, three subthemes emerged: a) science identity, b) career identity, and c) racial/ethnic identity. Consistent with Tinto’s (1993) model, participants directly expressed how their mentors influenced their scientific and career identities. Moreover, student-faculty racial/ethnic matched participants stated that their mentor influenced their racial/ethnic identity and helped them feel pride in their racial/ethnic identity. This pattern was not observed in nonmatched participants.

Science identity. Five participants (1 matched, 5 nonmatched) reported that their mentor influenced their scientific identities. Alejandra, a Latinx student, student-faculty racial/ethnic matched, noted that her mentor influenced her scientific identity, “In terms of science, I think that he's helped me see myself as more of a scientist because he doesn't question my abilities. He tells me to do things, and well I'm not going to deny him. I'm not going to say no. So, I either have to learn or I do it, and that really helps me just believe in myself as well. Because if he's not questioning me, why should I question myself. So, that really helps.”

Diego, a Latinx student, racial/ethnic nonmatched with an Asian-American male mentor, also noted that his mentor influenced his scientific identity.

Dr. X helped me a lot. Before I actually got into [undergraduate research training program], or before I actually got into [university], I met with him early on. He asked me what my goals were, what do I want to do, and so far, he reinforced what I wanted to do and pursue a Ph.D. Because he has lots of knowledge too. He's always very kind, and he's always asking me, “What do you think?” He always gives me questions like, “What do
you think we could do here?” And he always challenges me. So, challenging me pushes me to become a better scientist and that motivates me to pursue a Ph.D.

Maria, a Latinx student, racial/ethnic nonmatched with an Asian-American male mentor noted that her mentor influenced her scientific identity,

Me and my mentor don't share the same ethnic background and is male... But in all honesty, he has created my science identity. Prior, I had just transferred to [university] two years ago. And I was taking classes—I had no idea—I was taking lab classes but not really labs for research or anything like that. He took me into his research lab, he took me under his wing. He's super helpful all the time, and he asks me how I'm doing in my classes, and I'll be like, “I think I'm doing okay.” And he replies, “Oh, that's really good.” So, he really created who I am now in my work environment because if it wasn't for him, I would literally have no other experience outside the classroom.

According to Yosso (2005), Maria highlights navigational capital by demonstrating an awareness of essential career-advancement opportunities, such as labs. She also represents social capital by maintaining a solid relationship with her mentor, which is vital to her academic success.

**Career identity.** Eight participants (5 matched, 3 nonmatched) reported that their mentor influenced their career identities. Gabriel, a Latinx matched student, expressed that his mentor influenced his career identity.

Grad school has become much more of a solid route, and my career goal has switched to research specifically. So, I went from thinking, “I'm going to do therapy, maybe,” to like, “I don’t really like the therapeutic world. I like more of the research portion.” And being a part of his lab has helped me solidify that I want to do research after this. So yeah,
become a professor and do research and that's become much more of a solid goal now. There's not like five goals or five different plans, there's more like one.

Similarly, Sam, an Asian-American nonmatched student, expressed that her mentor influenced her career identity.

Similar to what Diego and Santiago said about mentors supplying them with more information, my mentor did something similar. He was telling me - he gave us a link … and was like, “Here are some prospects, career prospects.” And he's really supportive.

Before last year or last semester, I was telling him I wanted to pursue an M.D. and Ph.D., and he was really supportive... Last year was COVID; I didn't really get to work much on an independent project until recently, I think starting in January. And that reinforced my desire to pursue a Ph.D. only instead of an M.D. and Ph.D. And he was really informative about each career. He also gave me some Ph.D. programs in microbiology, and was like, “These schools have really good microbiology programs, and you should check that out.” And that was really helpful.

According to Yosso (2005), Sam demonstrates social capital by seeking out information from her mentor that will be instrumental to her long-term career goals.

Bianca, a Latinx nonmatched student, stated that her mentor influenced her career identity. She noted, “As far as the future goes, we did look into the ultimate goal, which was what I was going to do as a career after finishing my education. So, I definitely weighed those options a lot, and she had given me some opportunities to speak to some people that were majoring in my current major: Media Management. And I found that I did end up liking what I am studying currently. She definitely had a lot of influence in my education and my goals.”
According to Yosso (2005), Bianca demonstrates social capital by learning more about her major from her mentor and peers and using these inquiries to inform her long-term goals.

**Racial/ethnic identity.** Six participants, all racial/ethnic matched reported that their mentor influenced their racial/ethnic identities. Nonmatched participants did not report similar experiences. Adrian, a Latinx matched student, expressed that his mentor influenced his racial/ethnic identity: “Having conversations with my mentor would definitely reinforce everything and make me feel not so quiet about it. I'm definitely more openly accepting of the fact that I'm a minority. Back then, sad to say—but I wasn't proud of it. I was more so quiet about it. And I was like, ‘Oh, yeah, this is just something.’ But now I'm like, ‘No, yeah, this is who I am. This is what I am.’ And just made me more proud.”

According to Yosso (2005), Adrian demonstrates resistant capital by exemplifying a mental framework surrounding his minoritized background that is empowering, as opposed to one that is discouraged by systemic inequalities.

Jada, an African-American matched student, expressed that her mentor influenced her racial/ethnic identity:

When I first came [to university], that's one thing I hated, reading. But my mentor pushed me to read. Read books about my past and who I am and Black culture in general. It really gave me an understanding. So now I just feel better about myself, and I feel better about the work that I'm able to do and accomplish. Because I feel like not knowing who I was really deteriorated me from not moving forward because I wasn't right within myself. When I didn't know who I was, it was easy for other people to narrate my story about who I was and where I come from, and who I am. Like no, I know who I am, I know
what I want. I'm just more confident and I feel like it all comes from knowing who you are and having self-love and that's what I gained; that's what [mentor] helped me gain.

According to Yosso (2005), Jada demonstrates resistant capital by her engagement with behaviors (e.g., reading about Black history) that challenge narratives that society has placed on her and her community.

In brief, of the three subthemes that emerged within identity, one theme – scientific identity – was most common among nonmatch students, compared to match students. Further, career identity was prevalent amongst both matched and nonmatched students. Meanwhile, racial/ethnic identity was only found in matched students.
Discussion

The current mixed methods study examined student-faculty racial/ethnic match and its effect on mechanisms influencing BIPOC persistence in higher education towards increasing graduation rates in hopes of contributing to the literature of student-faculty racial/ethnic match on BIPOC students’ graduation rates. There is a dearth in the literature explaining how racial/ethnic match affects persistence and graduation rates. The study also investigated undergraduate students’ perceptions of their faculty mentors and how their mentoring relationships impacted mechanisms influencing their persistence.

First, the quantitative analyses did not reveal significant differences between racial/ethnic matched and nonmatched BIPOC students on mechanisms influencing their educational experiences. Second, the qualitative analyses revealed different themes regarding BIPOC students’ mechanisms influencing their persistence towards graduation rates.

**Student-faculty Racial/ethnic Match on Mechanisms Influencing BIPOC Graduation Rates**

Independent samples t-test of mechanisms influencing BIPOC graduation rates did not reveal a significant difference between racial/ethnic matched and nonmatched participants. There are several explanations for the lack of statistical significance. First, the sample size of 19 was very small, and the likelihood of any significant findings was improbable. Second, four participants in the racial/ethnic nonmatched sample had faculty mentors that were members of a BIPOC community (e.g., a Latinx student with an Asian-American faculty mentor). It may be that despite being of a different racial/ethnic community, BIPOC faculty members may be serving as allies for BIPOC students and may be providing similar resources and support than a non-BIPOC faculty mentor. Therefore, the independent samples t-test might not have fully captured how BIPOC faculty affect mechanisms influencing BIPOC students’ experiences.
towards graduation. Therefore, it is suggested that future studies examine *allyship* that may be taking place between racial/ethnic nonmatched BIPOC faculty and their BIPOC mentees. Furthermore, a larger sample size may be needed to quantitatively examine the role of the examined mechanisms on BIPOC students’ educational experiences in higher education.

**Faculty Mentorship on Mechanisms Influencing BIPOC Graduation Rates**

The current study also examined how undergraduate students’ perceptions of faculty mentors and how their mentoring relationships impacted mechanisms influencing their persistence. The mechanisms examined included possible selves, sense of belonging, negative racialized experiences, and imposter syndrome. While the study examined racial/ethnic matched vs. nonmatched students, it is worth noting that the nonmatched group could be further divided into nonmatch with a BIPOC mentor and nonmatch with a non-BIPOC mentor.

The findings of the focus groups revealed how BIPOC faculty facilitate a sense of belonging for BIPOC undergraduate students compared to non-BIPOC faculty. First, for the mechanism of sense of belonging, four themes emerged: a) mentors offered professional development opportunities, b) mentors provided emotional support, c) mentors created counterspaces, and d) diversity of students and faculty all facilitated students’ sense of belonging.

Nearly all participants in the current study discussed how their mentor provided professional development opportunities. This finding parallels the quantitative portion of the study, which revealed that matched (M = 3.33) and nonmatched students (M = 3.44) reported similar levels in their sense of belonging. Both matched and nonmatched students agreed that they belonged at the institution.
The theme of professional development is especially important for BIPOC students, whose previous experiences may not have prepared them sufficiently for the transition to college (Tinto, 1993). Tinto (1993) suggested that the formal skills needed to be successful in the academic environment were never a part of their lives before entering college. The results suggest that students with mentors are more equipped to adopt the academic environment's values, norms, and behavioral styles. This is in line with Castellanos et al.’s (2016) study of 277 students, which demonstrated that students with a mentor reported a stronger relationship and fit with the institution. Moreover, a sense of belonging may lead undergraduates to engage more deeply with their studies, leading to persistence (Strayhorn, 2012). Professional development is one way that faculty mentors are able to reveal the hidden curriculum of academia. The “hidden curriculum” in academia represents a set of informal norms and rules, expectations, and skills that inform institutional “ways of doing” academic practice (Calarco, 2020). The fact that there were no differences between matched and nonmatched students is not surprising. Prior research has found that faculty mentors (of all backgrounds) play an important role in students’ ability to be successful academically, thereby providing the professional development that students need, including research skills and networking abilities to be successful in their discipline.

Similarly, both the matched and nonmatched participants reported that their mentors provided emotional support. This is consistent with the literature that indicates that positive relationships with caring professors and mentors contribute to a sense of belonging (Freeman et al., 2007; Strayhorn, 2012). Moreover, research has also affirmed that positive interactions and perceived support from faculty increase students’ sense of belonging (Hausmann et al., 2007; Hurtado & Carter, 1997). Further, this support from faculty mentors may also improve mental health (Baumeister & Leary, 1995). However, more matched participants reported emotional
support than nonmatched students (5 of 10 vs. 2 of 9). This may due to the friendly and relaxed nature of the matched mentee and their mentor. For instance, several matched participants indicated that their mentor is highly accessible and helps them feel valuable. Further, a few matched participants stated that their mentor helped mentee reevaluate personal troubles into strengths.

In the current study, more racial/ethnic matched reported their mentors provided counterspaces compared to nonmatched participants. In this study, six matched students reported that their mentors provided counterspaces, compared to one nonmatched student. Counterspaces are spaces built and maintained by minoritized individuals to find support and develop survival strategies in unwelcoming social environments (Solorzano & Yosso, 2001; Yosso, 2013; Yosso & Lopez, 2010). Counterspaces serve as safe spaces – places where deficit notions of BIPOC students can be challenged, and places where a positive collegiate racial climate can be established and maintained for students facing microaggressions in academic and social spaces (Solórzano et al., 2000). 2022).

The considerable difference in this theme between matched and nonmatched participants is understandable. Perhaps, having a racial/ethnic matched mentor is already a counterspace in itself for BIPOC students. A counterspace does not need to be an actual space – it’s function is to increase BIPOC students sense of belonging on campus by developing and building community with other minoritized individuals (Roberts & Lucas, 2022). This unique contribution magnifies the cultural wealth (Yosso, 2005) that BIPOC faculty bring to the campus—often unacknowledged by the institution.

Counterspaces may be more critical on some campuses than others. For example, the institution in the current study is designated as a Hispanic-serving (HSI) and Minority-serving
institution (MSI). With the largest Chicana/o Studies department in the nation, and multiple ethnic studies departments, including Asian American Studies, Africana Studies, American Indian Studies, Central American Studies, it likely has more counterspaces for BIPOC students than other universities. Future research should investigate campuses that are less racially/ethnically diverse and the effects of counterspaces in BIPOC student outcomes.

While not a common theme, diversity facilitating a sense of belonging was mentioned by four student-faculty racial/ethnic matched participants. However, no nonmatched participants reported on this topic. These students regarded diversity as *compositional diversity* – the representation of different groups of people within the campus environment. Tinto (2017) explained that a student’s sense of belonging could be positively influenced through the diversity of faculty, administration, and staff, such as when they reflect the students’ backgrounds. Hurtado et al. (2012) suggest that campus racial/ethnic climate is a major factor affecting retention and graduation rates. Racial climate is composed of students’ observations of their experience as racially minoritized individuals on campus, which includes, but is not limited, to students’ experiences with racism to the belief that the university is not doing enough to support diversity (Reid & Radhakrishnan, 2003). One component of campus climate is institutional compositional diversity. Research has found that racial/ethnically minoritized students experience less frequent discrimination at more compositionally diverse institutions compared to less diverse ones (Hurtado & Guillermo-Wann, 2013). Diverse settings also have been found to provide more counterspaces to achieve positive racial climates, thus facilitating students’ sense of belonging (Roberts, 2022). Thus, a sense of belonging is linked to more welcoming campus environments, and subsequently, persistence. Moreover, BIPOC students at PWIs face multiple stressors related to the racial climate, racism, and discrimination, such as stress resulting from a
negative or unwelcoming campus environment (Fischer, 2007; Bonilla-Silva & Peoples, 2022). Research demonstrates that these factors serve as obstacles that negatively affect BIPOC student retention (Veal et al., 2012). While the university where the study was conducted is currently an HSI and MSI, the faculty are disproportionately white (55%), compared to undergraduate students, which are racial/ethnically minoritized (62%). Future research should investigate campuses that are less diverse (e.g., PWI or HWCU) and campuses where the faculty, administrators, and staff are more representative of the student population and how the compositional diversity affects students’ sense of belonging.

Most literature on sense of belonging does not highlight the process through which BIPOC students develop a sense of belonging, especially as it relates to the effects of student-faculty racial/ethnic match. Instead, the literature has emphasized the relationship between sense of belonging and variables such as persistence and academic success (Freeman et al., 2007; Hausmann et al., 2007), or campus involvement (Hurtado & Carter, 1997; Johnson et al., 2007; Strayhorn, 2012). This study adds to the literature by offering explanations that reflect how BIPOC students develop a sense of belonging. These processes are crucial to address because students’ sense of belonging is crucial for progression and retention (Chapman, 2017).

The findings also revealed how BIPOC faculty facilitate possible selves in BIPOC undergraduate students compared to non-BIPOC faculty. Mentees consistently indicated that their mentors influenced their graduate school possible selves (i.e., future-oriented element of self-concept). This pattern was salient for matched and nonmatched students. This is consistent with literature suggesting that having a mentor of one’s own race is felt important by BIPOC students. Nevertheless, same-race/ethnicity mentors are not necessary to ensure student success (Blake-Beard et al., 2011). In the case of graduate school and Ph.D. aspirations, perhaps what
determines the outcomes of the mentoring relationship is not the match between the mentee and the mentor but the match between what the mentee needs and what the mentor can provide. This is consistent with the concept of allyship, which consists of supporting minoritized groups through meaningful relationships and taking concrete action to dismantle inequitable systems. The findings suggest that faculty mentors, racial/ethnically matched or not with their students, can provide BIPOC students with essential knowledge to succeed in higher education institutions. For instance, faculty mentors of all backgrounds are able to inform their students about the *hidden curriculum* of academia – the set of informal norms and rules, expectations, and skills that inform institutional “ways of doing” academic practice (Calarco, 2020).

During the focus group interviews, it was apparent that many participants had clearly defined academic or career goals (i.e., academic possible selves). This claim is also supported in the quantitative portion of the results. There were no significant differences in academic possible selves between matched and nonmatched participants. That is, nearly every student described at least three expected academic possible selves (e.g., enrolling in a graduate program) and feared academic possible selves (e.g., failing a class). Moreover, many of these students were aspiring to pursue a Ph.D. It may be that the participants in the current study did self-select to participate because they already had high grades, high levels of self-efficacy, and high levels of confidence in themselves, and their choices that their academic outcomes are less influenced by external factors, such as the race of their mentor. Thus, it could be that the topic of the study drew in higher achieving students. The current study did not collect self-reported GPA or measures of self-efficacy, which is worth exploring in future research.

Yet, there were clear distinctions that were influenced by student-faculty racial/ethnic match. For example, matched participants consistently stated that the match helped them believe
in what was possible for them in the future. That is, matched participants felt that their mentor’s same race/ethnicity empowered them to actualize their goals compared to nonmatched participants. This is consistent with literature that addresses the need for same-race mentors to stimulate vicarious learning and subsequently positively influence the academic outcomes of BIPOC students (Bakken, 2010; Stephenson-Hunter et al., 2021). For instance, Stephenson-Hunter et al. (2021) examined an undergraduate research program in which students were paired with medical students from similar backgrounds and cultures. The results suggest that this positively impacted mentees’ self-efficacy and belief that if “someone like them” could make it, maybe they could too (Stephenson-Hunter et al., 2021). Relatedly, Bakken et al. (2010) examined a research training program in which deliberate attempts were made to select instructors for the program to serve as role models for participants, giving close attention to gender and race to reinforce vicarious learning; thereby strengthening mentees’ self-efficacy.

The third research questions sought to understand how BIPOC faculty mitigate negative racial experiences for BIPOC students compared to non-BIPOC faculty. Although mentees contextualized some of their focus group responses within the context of racial/ethnic identity, only six of the nineteen participants (5 matched, 1 nonmatched) reported discussing negative racialized experiences with their mentors. Moreover, thirteen of the nineteen participants (5 matched, 8 nonmatched) reported that they have not discussed negative racialized experiences with their mentors. This was consistent across the qualitative as well as the quantitative portions of the study. The quantitative findings indicated that matched participants ($M = 1.73$) reported similarly low levels of negative racialized experiences as nonmatched participants ($M = 1.92$). A mean score of two of a 5-point Likert scale is “rarely,” suggesting that these participants experienced few negative racial experiences on campus. It is worth noting that several
nonmatched participants promptly and clearly reported that they do not discuss negative racial experiences with their mentor.

The lack of negative racial experiences is likely due to the university setting. In the Fall of 2021, the institution used in the current study had an undergraduate population of nearly 34,000, of which 71% were BIPOC (CSUN, n.d.). Moreover, 27.7% of all faculty members are from BIPOC backgrounds (CSUN, n.d.). However, it is worth noting that faculty do not match the student demographics. For example, undergraduates are 57% Latinx, but only 11.6% of all faculty are Latinx. Therefore, students may be able to find a BIPOC mentor, however, they will not be matched.

Llamas et al. (2019) found that campus racial/ethnic composition strongly predicted GPA, which predicted graduation. Moreover, a more diverse campus predicted higher GPAs for BIPOC students. The findings suggest that increasing diversity is essential in improving GPA and graduation rates for BIPOC students, yet, demonstrate that expanding diversity alone is incomplete. Campus racial/ethnic climate negatively predicted GPA suggesting that an unwelcoming campus racial/ethnic climate predicted poorer GPAs (Llamas et al., 2019). Moreover, past research also found that campus racial/ethnic climate mediates BIPOC students’ persistence (Castillo et al., 2006; Wei et al., 2011). Therefore, students that do encounter negative racial experiences may have worse academic outcomes or lower rates of persistence if they do not have a faculty mentor that can mitigate these effects.

The findings of the focus groups revealed how racially/ethnically matched mentors and nonmatch mentors mitigated imposter syndrome amongst BIPOC students. In particular, thirteen of the nineteen participants (9 matched, 4 nonmatched) reported that their mentor mitigated their imposter syndrome. The prevalence of these conversations implies that BIPOC students are
experiencing imposter syndrome. This is consistent with the quantitative portion of the study that indicates match (M = 3.52) and nonmatch (M = 3.34) participants reported moderate levels of imposter syndrome.

The prevalence of imposter syndrome found in BIPOC students in the current study is in line with the literature that indicates that BIPOC students are more likely to feel like imposters than non-BIPOC students (Gardner & Holley, 2011; Peteet et al., 2015). Moreover, about one-third of students experience imposter syndrome (Smith, 2012; Jostl et al., 2012). Estimates of imposter syndrome prevalence suggest that as many as 70% of people experienced imposter syndrome (Gravois, 2017). Therefore, imposter syndrome is not unique to BIPOC students, yet it is vital to address it for several reasons.

The prevalence of imposter syndrome in the current sample of undergraduates is alarming, given that academic settings reinforce imposter feelings (Klinkhammer & Saul-Soprun, 2009; McCormick & Barnes, 2007). The findings indicate that the incessantly evaluative nature of higher education and the attention placed on the intellectual ability of BIPOC undergraduates may engender imposter feelings. This may be particularly true for the current sample of students with high academic aspirations (e.g., Ph.D. aspirations) and several students reporting majors in the natural or biological sciences.

Mentors mitigating imposter syndrome amongst BIPOC students is essential to address given that imposter syndrome can interfere with the academic development of high-achieving students (e.g., poor class attendance, limited campus involvement) (Peteet et al., 2015). Moreover, depression is also common in the presence of the imposter syndrome (McGregor et al., 2008; Bernard et al., 2002) and poor self-concept (Sonnak & Towell, 2001).
Previous research on BIPOC students has demonstrated that low psychological well-being and low ethnic identity are predictors of imposter syndrome (Peteet et al., 2015). Moreover, Lige et al. (2017) suggest that cultivating racial identity development and self-esteem may limit imposter syndrome experiences among African American undergraduates. The current study found that racial/ethnic matched students reported that their mentor influenced their racial/ethnic identities. Meanwhile, this pattern was not observed in nonmatched students. Thus, it could be the case that student-faculty racial/ethnic match may mitigate imposter syndrome through its relationship with racial identity development and subsequently positively affect the persistence of BIPOC students.

Nine out of ten students with a match reported that their mentor mitigated their imposter syndrome. Therefore, it could be that the mentors themselves (not just conversations with mentors) were instrumental in mitigating the mentees’ imposter syndrome. Future research could unravel if both conversations with racially/ethnically matched mentors and the mentors themselves are instrumental in mitigating imposter syndrome amongst BIPOC students. If BIPOC faculty mentorship mitigates imposter syndrome amongst BIPOC students, perhaps institutions could do more to facilitate mentoring relationships between students and faculty. If the presence of BIPOC faculty in the classroom can mitigate imposter syndrome, then just having BIPOC faculty on the campus could have the same effect. Be that as it may, findings from this study suggest that student-faculty racial/ethnic match may positively influence the persistence of BIPOC students.

In the current study, both matched and nonmatched participants mentioned that their mentors influenced their science identities, with this pattern being most common amongst nonmatch students. Moreover, career identity was found amongst both matched and nonmatched
students. Nevertheless, racial/ethnic identity was only found in matched students. This is important because individuals give meaning to events and challenges in ways congruent with currently active identities and prefer identity-congruent to identity-incongruent behaviors (Oyserman & Destin, 2010; Oyserman & Lewis, 2017). When behaviors feel identity-congruent, experienced difficulty emphasizes that the behavior is crucial and meaningful. Conversely, when behavior feels identity-incongruent, the same problem indicates that the behavior is pointless and “not for people like me” (Oyserman, & Destin, 2010; Oyserman & Lewis, 2017).

Equally, matched and nonmatched participants revealed that their mentors influenced their science identities. This is consistent with Hurtado et al.’s (2011) mixed methods study of aspiring scientists that found faculty collaboration with students was a vital source of support in preparing the next generation of scientists. Again, it is worth emphasizing that many of these students had clearly defined academic possible selves, as supported by this study's qualitative and quantitative methods. Therefore, it could be the case that for most of these participants, their high aspirations (e.g., becoming a scientist) reflected their high grades and prior academic accomplishments.

Five participants (1 matched, 5 nonmatched) reported that their mentor influenced their scientific identities. Eight students (3 matched, 5 nonmatched) reported majors in the natural or biological sciences. Further, eight students (5 matched, 3 nonmatched) reported majors in the social and behavioral sciences. Of the five nonmatched participants that reported that their mentor influenced their scientific identities, four indicated a major in the natural or biological sciences. Therefore, students in these disciplines may have been more inclined to identify as scientist because it is consistent with their training. Meanwhile, students reporting a major in the
social and behavioral science may require further training (e.g., graduate school) to be inclined to identify as scientists.

Social identity theory is a fundamental theoretical underpinning of several racial/ethnic identity frameworks (Tajfel & Turner, 1986). From a social identity theory perspective, positive in-group identity (a positive sense of belonging and connection to critical social groups) produces feelings of self-worth and motivation to enact group identity (Luhtanen & Crocker, 1992). In the current study, six matched participants mentioned that their mentors influenced their racial/ethnic identities. Meanwhile, this pattern was not observed in nonmatch students.

Identity-Based Motivation theory (IBM, Oyserman, 2015) outlines a process model in which self-regulation and, therefore behavior change, is likely when aspirations are linked with contextually salient strategies, when they are congruent with social identity, and when difficulty is understood as a customary part of the process of academic attainment. The theory suggests that the match helps BIPOC students identify with their professors, (1) making the future seem relevant to the present, (2) making strategies (e.g., studying) feel identity congruent, and (3) facilitating the interpretation of experienced challenges as an indicator of task significance.

Furthermore, research demonstrates that racial/ethnic identity has a positive effect on academic performance (Oyserman & Yoon, 2009), such as GPA (Altschul et al., 2006) and academic self-efficacy (Oyserman et al., 2003; Oyserman et al., 2001). Therefore, this pattern showcases how student-faculty racial/ethnic match positively influences the academic outcomes of BIPOC students.

Moreover, racial/ethnic identities are likely to be part of self-concept (Howard 2000; Oyserman, 2008) and are implicated in self-processes such as, protecting or feeling good about oneself (i.e., self-protective), knowing oneself (i.e., self-knowledge function), and improving
oneself (i.e., self-improvement function) (Oyserman et al., 1995; Oyserman & Markus, 1993). In its self-protective function, racial/ethnic identities protect students from vulnerability to stereotypes (Oyserman & Yoon, 2009). In its self-knowledge function, racial/ethnic identities facilitate feelings of self-worth while providing a framework to make sense of the social world and others’ responses to the self (Oyserman & Yoon, 2009). Finally, in its self-improvement function, racial/ethnic identities positively affect persistence, especially academic attainment (Oyserman & Yoon, 2009).

Although participants did not complete a standardized measure of racial/ethnic identity (e.g., MEIM, Phinney, 1992; MIBI, Sellers et al., 1997), it is worth noting that low racial/ethnic identity (defined as lack of connectedness to in-group and lack of awareness of racism) is associated with low well-being and low self-esteem in BIPOC students (Pierre & Mahalik, 2005; Pillay, 2005; Pyant & Yanico, 1991). Conversely, research has demonstrated a positive association between positive feelings about and connection to one’s racial/ethnic in-group and self-esteem (Swanson et al., 2003; Vandiver et al., 2002; Worrel et al., 2004). Given that racial/ethnic identity is related to academic attainment, wellbeing, and self-esteem, future research should collect quantitative data on students reporting a student-faculty racial/ethnic match to compare students with different levels of racial/ethnic identity.
Limitations

Notwithstanding the strengths of the current study, there are several significant limitations to address. First, the generalizability of the findings is restricted. For example, the sample was composed of students with high academic aspirations (e.g., Ph.D. aspirations). Moreover, eight students (3 matched, 5 nonmatched) reported majors in the natural or biological sciences. These aspirations may very well reflect their grades and levels of self-efficacy. As a result, a student-faculty racial/ethnic match may enhance their academic experience but not be a precondition for their persistence. The findings may be inconsistent when examined with a group of students that are not as academically inclined.

Moreover, the current study used students from a diverse four-year institution. Results may differ when investigated with a sample of students from two-year institutions. BIPOC students from a two-year institution may lack sufficient resources to be successful and, therefore, may need BIPOC mentors to facilitate their academic achievement. Additionally, the students in the current study attended a Hispanic-serving institution with a diverse student population and faculty. Findings may differ when examined with a group of BIPOC students attending PWIs. For this study, students were assessed as BIPOC without special attention to specific ethnic groups to demonstrate the need for BIPOC faculty for diverse students. Nevertheless, different racial/ethnic groups face unique challenges, and therefore distinct patterns may emerge when analyzing particular ethnic groups (e.g., George et al., 2014; Yang, 2004).

Furthermore, the current study did not measure the quality of the relationship between the faculty mentor and the mentee directly. A worthy direction for future research may include the interaction between student-faculty racial/ethnic match and the relationship quality. This study used Tinto’s Interactionalist Theory of College Student Departure (1993), yet this persistence
model is intricate and consists of several variables. Nevertheless, the application of this model in the current study does indicate that BIPOC faculty can be a significant variable within the model. Finally, the present study cannot assess long-term outcomes, particularly graduation. Although the literature suggests facilitating a sense of belonging and possible selves and mitigating negative racial experiences and imposter syndrome positively affects BIPOC graduation rates, the current study does not elucidate if these factors are sufficient to get students to graduation.
Conclusion

The findings of the study illuminate unique contributions that BIPOC faculty make towards the academic success of BIPOC students. In particular, BIPOC students with a match are afforded counterspaces and mentors can facilitate their racial/ethnic identities. Additionally, same-race mentors help students believe what is possible for them in the future and mentees feel more at ease discussing negative racialized experiences compared to nonmatch students. Further, several match mentees reported that their mentors mitigated their imposter syndrome, and a few nonmatch mentees also reported similar experiences. Nevertheless, the findings suggest that faculty mentors of all backgrounds provide mentees with professional development and influence mentees’ possible selves and career and science identities.

Ambitious proposals for recruiting BIPOC faculty have been motivated by the assumptive educational benefits for BIPOC students. However, previous research has demonstrated that drawing reliable inferences about this relationship between BIPOC students and BIPOC faculty is challenging. Therefore, the study’s most significant strength is that it provides evidence of how BIPOC faculty positively influence BIPOC student persistence through many different types of passive and active effects. A better grasp of the racial/ethnic dynamics within university settings could indicate policies and practices improving current recommendations to recruit BIPOC faculty more purposefully. Further, these results could lead to scholarship on how institutions can develop sustainable policies that promote racial equity instead of fluctuating initiatives. Relatedly, a better understanding of why the racial/ethnic interactions between undergraduates and faculty matter for student outcomes could lead to more balanced policies. Particularly, understanding the relative educational consequences of facilitating a sense of belonging and possible selves and mitigating negative racial experiences
and imposter syndrome could offer new guidelines that recruit faculty members that are effective for all students regardless of race. For example, the findings highlight the importance of allyship in academia - critical for creating inclusive communities that are welcoming to all students. Until the faculty begin to reflect the student population, the importance of allies is critical to the success of BIPOC students. Research demonstrates that perceiving an individual lacking a shared racial identity as an ally may encourage a sense of belonging among BIPOC students (Johnson et al., 2019; Pietri et al., 2018). Regardless, as the proportion of BIPOC students in American higher education institutions continues to grow, it will be essential to address faculty recruitment and representation issues and learn more about the outcomes through rigorous studies.
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Appendix A

Demographic questions:
- What is your name? (open-ended)
- What is your email address? (open-ended)
- What is your age? (open-ended)
- What is your ethnicity/race? (Select: Asian / Pacific Islander, Black or African American, Hispanic or Latino, Native American or American Indian, White. Other: open-ended).
- Are you currently an undergraduate at [public 4-year institution in southern California]? (open-ended)
- What is your major? (open-ended)
- When is your expected graduation? (open-ended)
- How many years have you been at [public 4-year institution in southern California]? (Select: 1, 2, 3, 4, 5, 6+).

Mentor:
- Do you currently have a mentor (someone who provides both career preparation and psychosocial support, such as encouragement, and advice and feedback on performance)? (dichotomous: yes or no)
- What is the title/position of your mentor?
- Which department is your mentor in? (open-ended)
- How long have you been in a mentoring relationship with your mentor (years and months) (ex: 1 year and 3 months)? (open-ended).
- Does your mentor have the same or similar cultural or ethnic/racial background as your own? (dichotomous: yes or no).

Zoom
- Please select from the following times and dates that you are available to attend a Zoom focus group session. Sessions will run for 60-90 minutes with a total of 3-4 students in attendance.
Appendix B

Focus group questions:

1. Think back to before you met your mentor. What were some career or educational goals that you hoped to achieve?
   a. Have your goals changed?
2. How has your mentor influenced your thoughts about your future?
3. In what ways has your mentor helped you feel a sense of connection to the campus community?
4. How has your mentor influenced your identity/identities?
   a. Prompt: such as ethnic-racial identity? Career identity? Science identity?
5. Can you share unique ways in which your mentor has supported you?
6. Have you ever discussed any negative racial experiences with your mentor?
7. If you’ve ever felt like a fraud or imposter as a student or in your major, are there ways your mentor influenced your views?
## Appendix C

### Sense of Belonging

<table>
<thead>
<tr>
<th>strongly agree</th>
<th>agree</th>
<th>disagree</th>
<th>strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

1. I see myself as part of the campus community.

2. I feel that I am a member of this college.

3. I feel I have a sense of belonging to this college.

### Academic Possible Selves

Next year, I expect to be…
1. 
2. 
3. 

Next year I want to avoid being…
1. 
2. 
3.
Negative Racial Experiences

<table>
<thead>
<tr>
<th>never</th>
<th>rarely</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1. felt insulted or threatened because of race/ethnicity
2. had tense/hostile interactions related to race
3. had guarded/cautious interactions related to race
4. heard faculty express stereotypes about racial/ethnic groups in class
Clance Impostor Phenomenon Scale (CIPS)

For each question, please circle the number that best indicates how true the statement is of you. It is best to give the first response that enters your mind rather than dwelling on each statement and thinking about it over and over.

not at all true  rarely  sometimes  often  very true
1  2  3  4  5

1. I have often succeeded on a test or task even though I was afraid that I would not do well before I undertook the task.

2. I can give the impression that I’m more competent than I really am.

3. I avoid evaluations if possible and have a dread of others evaluating me.

4. When people praise me for something I’ve accomplished, I’m afraid I won’t be able to live up to their expectations of me in the future.

5. I sometimes think I obtained my present position or gained my present success because I happened to be in the right place at the right time or knew the right people.

6. I’m afraid people important to me may find out that I’m not as capable as they think I am.

7. I tend to remember the incidents in which I have not done my best more than those times I have done my best.

8. I rarely do a project or task as well as I’d like to do it.

9. Sometimes I feel or believe that my success in my life or in my job has been the result of some kind of error.

10. It’s hard for me to accept compliments or praise about my intelligence or accomplishments.

11. At times, I feel my success has been due to some kind of luck.

12. I’m disappointed at times in my present accomplishments and think I should have accomplished much more.

13. Sometimes I’m afraid others will discover how much knowledge or ability I really lack.
14. I’m often afraid that I may fail at a new assignment or undertaking even though I generally do well at what I attempt.

15. When I’ve succeeded at something and received recognition for my accomplishments, I have doubts that I can keep repeating that success.

16. If I receive a great deal of praise and recognition for something I’ve accomplished, I tend to discount the importance of what I’ve done.

17. I often compare my ability to those around me and think they may be more intelligent than I am.

18. I often worry about not succeeding with a project or examination, even though others around me have considerable confidence that I will do well.

19. If I’m going to receive a promotion or gain recognition of some kind, I hesitate to tell others until it is an accomplished fact.

20. I feel bad and discouraged if I’m not “the best” or at least “very special” in situations that involve achievement.
### Appendix D

<table>
<thead>
<tr>
<th>Theme/Mechanism</th>
<th>Codes</th>
</tr>
</thead>
</table>
| Sense of belonging    | Mentor directs mentee to campus clubs, organizations, resources, and activities  
Mentor builds community through off-campus activities  
Mentor provides mentee with emotional support  
Mentor helps mentee with networking  
Mentor is highly accessible to mentee  
Mentor helps mentee feel valuable  
Mentor helped mentee reevaluate personal troubles into strengths |
| Possible selves       | Mentor influenced mentee’s prospective career  
Mentor influenced mentee to change major  
Mentor influenced mentee to pursue graduate school  
Mentor reinforced mentee’s motivation to pursue a PhD  
Mentor reinforced mentee’s motivation to pursue their prospective major  
Mentor helped mentee refine goals  
Mentee sees same-race/ethnicity mentor and it helps them believe in themselves  
Mentor helped mentee with a mindset shift, especially as it relates to their ability to effectively contribute to the field |
| Negative racialized experiences | Mentor positively addresses mentee’s diversity in sciences concerns  
Mentor validates mentee’s racial experience(s)  
Mentee discusses negative racial experiences with mentor  
Mentee hasn’t discussed racial issues with mentor  
A diverse setting mitigates mentee’s campus negative racial climate |
| Imposter syndrome     | Mentor in a indirectly mitigates mentee’s imposter syndrome  
Mentor directly mitigates mentee’s imposter syndrome  
Lack of diversity exacerbates mentee’s imposter syndrome  
Mentor exacerbates mentee’s imposter syndrome due to the nonmatch  
Mentor mitigates mentee’s imposter syndrome due to the match  
Mentee mentioned that not a lot of scientists looked like them |
| Identity              | Mentor doesn’t influence mentee’s personal identities  
Mentor influenced mentee’s personal identities  
Mentor facilitated mentee’s scientific identity  
Mentor influenced mentee’s career identity  
Mentor influenced mentee’s racial/ethnic identity  
Mentor helped mentee feel pride in racial/ethnic identity |