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SENSE OF BELONGING AND ITS CONTRIBUTING FACTORS IN GRADUATE EDUCATION

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ABSTRACT

Aim/Purpose: The purpose of our study was to gain a better understanding of the factors that contribute to graduate student sense of belonging and gain insights into differences in sense of belonging for different groups of students.

Background: Sense of belonging, or the feeling that a person is connected to and matters to others in an organization, has been found to influence college student retention and success. Literature on sense of belonging has, however, focused primarily on undergraduate students and little is known about graduate students' sense of belonging.

Methodology: We conducted an exploratory, cross-sectional survey study of graduate students at four public doctoral and comprehensive universities in Maryland, USA. All four institutions were participating in the NSF-funded PROMISE program, which strives to support the retention and academic success of women and underrepresented minority (URM) graduate students. A total of 1,533 graduate students from these four institutions completed the survey.

To analyze our data, we used Structural Equation Modeling (SEM) to test direct and indirect effects of multiple latent variables (i.e., gender, race/ethnicity, STEM affiliation, critical mass of women, participation in the PROMISE program, sense of belonging) on each other.

Contribution: Research found that sense of belonging influences graduate student retention and success. Thus, gaining a better understanding of the factors that influence graduate student sense of belonging can help improve retention and completion rates, an important issue as national seven-year completion rates have hovered around 44% in the United States. Completion rates have

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	been even lower for women and URM students (i.e., African Americans, Hispanics, American Indians, Alaska Natives, and Native Hawaiians or other Pacific Islanders) compared to White students, making sense of belonging an important topic to study for these populations.
Findings	We found that professional relationships matter most to graduate student sense of belonging. Professional relationships influenced graduate student sense of belonging more than reported microaggressions and microaffirmations, though they also played a role. We also found differences based on students' identity or group membership. Overall, microaffirmations played a bigger role in female graduate student sense of belonging and the ecosystem of non-STEM programs seemed to have more facilitators of sense of belonging than the ecosystem of STEM programs.
Recommendations for Practitioners	We recommend that graduate programs think strategically about enhancing sense of belonging in ways appropriate to the distinct culture and nature of graduate education. For example, departments can make efforts to support sense of belonging through creating community-oriented peer networks of students, transparent policies, and access to information about resources and opportunities. Programs such as PROMISE can support the retention and success of women and URM graduate students, but aspects of these programs also need to be incorporated into graduate programs and departments.
Impact on Society	Because graduate student sense of belonging has been found to impact students' interest in careers in academia, fostering graduate student sense of belonging could be a tool for improving pathways to the professoriate for groups that are typically underrepresented in academia such as women and racial or ethnic minorities. Increasing the number of women and URM faculty could, in turn, positively impact the support available to future URM students, which could positively influence future URM students' sense of belonging.
Future Research	Sense of belonging is an important area for future graduate education research and should be studied through survey research with a larger sample of U.S. students than the current study. Sense of belonging is relevant to graduate education worldwide. Future studies might explore graduate student sense of belonging in different national contexts and the role culture plays in shaping it. Moreover, changes in graduate student sense of belonging over the course of their program should be assessed.
Keywords	Sense of belonging, graduate education, underrepresented minority students

INTRODUCTION

Sense of belonging, a feeling of connectedness and belief that one is important and matters to others in an organization, ranks third on most people's hierarchy of needs, after physiological and safety needs (Maslow, 1954). Sense of belonging has been studied in relationship to mental health, well-being, and quality of life (e.g., Böhnke, 2005; Choenarom, Williams, & Hagerty, 2005; Hagerty, Lynch-Sauer, Patusky, Bouwsema, & Collier, 1992; Rosenberg & McCullough, 1981; Young, Russell, & Powers, 2004). In higher education, sense of belonging has been tied to key educational outcomes such as academic self-concept, self-efficacy, intrinsic motivation, academic success, and persistence (Freeman, Anderson, & Jensen, 2007; Hausmann, Schofield, & Woods, 2007; Lovitts, 2001; Ostrove, Stewart, & Curtin, 2011; Strayhorn, 2012). Sense of belonging has

been found to influence college student retention and persistence for undergraduate students (Freeman et al., 2007; Hausmann et al., 2007; Strayhorn, 2012). Yet, few studies have explored sense of belonging within graduate education.

Sense of belonging in graduate education is likely to be both similar and distinct from sense of belonging in undergraduate education. For example, studies on undergraduate students' sense of belonging have focused on students' belonging to an institution, which is often developed through involvement in residential environments, learning communities, and involvement in student organizations (Hoffman, Richmond, Morrow, & Salomone, 2002; Johnson et al., 2007; Stebleton, Huesman, & Kuzhabekova, 2010). However, since graduate students tend to primarily focus on professional and career goals, they are more likely to be connected to a specific graduate program or department and are socialized into their fields of study or disciplines, rather than their institutions (Gardner & Barker, 2015; Hermanowicz, 1998). Graduate students are also less likely to live on campus and their involvement is typically more focused on career preparation and professional associations (Gardner & Barker, 2015). But, as for undergraduate students, research found that sense of belonging influences graduate student retention and success (Lovitts, 2001; Strayhorn, 2012). Gaining a better understanding of the factors that influence graduate student sense of belonging can therefore help improve retention and completion rates, an important issue as national seven-year completion rates in the United States have hovered around 44% (Council of Graduate Schools, 2008). Completion rates have been even lower for women and underrepresented minority (URM) students (i.e., African Americans, Hispanics, American Indians, Alaska Natives, and Native Hawaiians or other Pacific Islanders) compared to White students (Council of Graduate Schools, 2008), making sense of belonging an important topic to study for these populations.

Graduate student sense of belonging has not only been found to impact retention and completion rates but also graduate students' interest in pursuing a research or faculty career in academia (Ostrove et al., 2011). Students, who are considering careers in academia, may hesitate to pursue these careers if they do not feel like they belong within their academic department and academic field (Austin, 2002; Ostrove et al., 2011). Fostering graduate student sense of belonging could, thus, be a tool for improving pathways to the professoriate for groups that are typically underrepresented in academia such as women and racial or ethnic minorities (Ong, Wright, Espinosa, & Orfield, 2011). Increasing the number of women and URM faculty could, in turn, positively impact the support available to future URM students, which could positively influence future URM students' sense of belonging (Ong et al., 2011).

To gain a better understanding of the factors that contribute to graduate student sense of belonging and gain insights into differences in sense of belonging for different groups of students, we conducted an exploratory study with participants from four institutions in the United States. We chose to situate our study in the United States, because the National Science Foundation (NSF) had recently created programmatic initiatives that aim to support the retention and career advancement of women and URM graduate students. At the time of the study, all four institutions were participating in one of these NSF programs, PROMISE: Maryland's Alliance for Graduate Education and the Professoriate (AGEP). By drawing a sample of students from institutions that offered programmatic initiatives that aim to support graduate student retention and career advancement, we were able to not only gain an understanding of graduate student sense of belonging overall, but also explore how participation in such programmatic initiatives influenced graduate student sense of belonging. The following research questions guided our inquiry:

1. Which factors influence graduate student sense of belonging?
2. Do student demographics (gender, race/ethnicity), organizational locations (field/discipline, critical mass), and participation in the PROMISE program influence graduate student sense of belonging?

GUIDING LITERATURE

We were guided by literature on sense of belonging, the factors that contribute to it, and related studies on graduate education. In higher education, sense of belonging refers to "students' perceived social support on campus, a feeling or sensation of connectedness, the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the group (e.g., campus community) or others on campus (e.g., faculty, peers)" (Strayhorn, 2012, p. 3). Sense of belonging is lowest when students feel that they are in the minority, marginalized, and unwelcome (Hurtado & Carter, 1997; Strayhorn, 2012).

GRADUATE STUDENT SENSE OF BELONGING AND SOCIALIZATION

Research on graduate student sense of belonging has been scarce but is growing (see Curtin, Stewart, & Ostrove, 2013; Ong et al., 2011; Ostrove et al., 2011; Strayhorn, 2012). Much of the literature on graduate student experiences has addressed a different, though related, concept: graduate student socialization. Socialization is the process of learning the knowledge, skills, norms, and values of a graduate program and discipline or field and becoming part of an academic community (Weidman, Twale, & Stein, 2001). Graduate student socialization has been found to be important for academic success and persistence (Gardner & Barnes, 2007). Socialization can help individuals move from being an outsider in their program or field to becoming a valued insider (Strayhorn, 2012). In other words, meaningful socialization experiences likely shape graduate students' sense of belonging within departments and fields (Strayhorn, 2012). The concepts are closely related and, thus, graduate student socialization research can provide insights into potential factors that influence graduate student sense of belonging.

FACTORS THAT MAY INFLUENCE GRADUATE STUDENT SENSE OF BELONGING

Our review of the literature suggested several factors that are likely to influence graduate student sense of belonging. These include professional networks and mentoring, microaggressions and microaffirmations, student demographics (i.e., gender, race/ethnicity), and organizational contexts (i.e., critical mass of underrepresented students in a field, and participation in programs designed to support graduate students). We discuss each of these factors next and share how we explored these factors in our study.

Professional networks and mentoring

Studies on graduate student sense of belonging found connections between students' integration into key networks within their graduate departments, the support graduate students receive from their advisor, and their sense of belonging (Curtin et al., 2013; Lovitts, 2001). Much other research on graduate education also highlights the importance of professional networks and mentoring relationships with advisors. Professional interactions with colleagues in graduate departments have been found to shape graduate students' experiences and career advancement (Jaeger et al., 2016; O'Meara et al., 2014). Students' perceptions of networking within their graduate department are also positively connected to student success (Lovitts, 2001). Likewise organizational theorists suggest in the broader literature that professional networks positively impact career outcomes (Cross & Cummings, 2004; Lin, 2001; Marsden & Hulbert, 1988). Important relationships within students' professional networks are their mentoring relationships with their advisor and other faculty. Research found that graduate students who have access to positive mentoring relationships report increased levels of satisfaction with graduate school and interest in becoming professors; these students also exhibit high levels of academic performance, critical thinking ability, and academic skill development (Adams, 1992; Belcher, 1994; Hill, Castillo, Ngu, & Pepion, 1999; Kelly & Schweitzer, 1999; Tenenbaum, Crosby, & Gliner, 2001). Mentoring becomes even

more important when students are engaged in interdisciplinary research (Boden, Borrego, & Newswander, 2011). Because academia is often not set up to support interdisciplinary research ventures, students who are engaged in this work rely heavily on their advisor to help them navigate different disciplinary cultures and expectations (Boden et al., 2011). When students involved in interdisciplinary research do not get the support they need, they are likely to feel like "outsiders" at their academic institutions (Boden et al., 2011), which is likely to contribute to a lower sense of belonging. In a similar vein, URM students have been found to be less likely than white students to have access to positive mentoring relationships (Antony & Taylor, 2004; M. C. Brown, Davis, & McClendon, 1999; Patton & Harper, 2003; Waldeck, Orrego, Plax, & Kearney, 1997), which is likely to contribute to a lower sense of belonging. For example, URM graduate students reported that their interactions with faculty are often marked by low expectations and stereotypes rather than support, which leaves them feeling unwelcome in their graduate programs and fields (Antony & Taylor, 2004; Carlone & Johnson, 2007; Johnson-Bailey, Valentine, Cervero, & Bowles, 2009). We, thus, anticipate that the strength of one's professional network and quality of mentoring experiences impacts graduate student sense of belonging.

Microaffirmations and microaggressions

Other factors that may shape graduate student sense of belonging are microaffirmations and microaggressions. Microaggressions are defined as "brief, everyday exchanges that send denigrating messages" to individuals because of their membership in a marginalized racial identity group (Sue et al., 2007, p. 273). Microaggressions may be unconsciously delivered and often take the form of subtle slights, snubs, and questions about one's ability and belonging (Solorzano, Allen, & Carroll, 2002; Solorzano, Ceja, & Yosso, 2000; Sue et al., 2007). Research found that the experience of microaggressions in academic and social spaces on campus negatively influences retention, perception of the campus climate, and academic success (Clark, Mercer, Zeigler-Hill, & Dufrene, 2012; Gomez, Khurshid, Freitag, & Lachuk, 2011; Maton et al., 2011; Nadal, Pituc, Johnston, & Esparrago, 2010; Solorzano et al., 2000; Van Ryzin, Gravely, & Roseth, 2009; Walton & Cohen, 2007; Yosso, Smith, Ceja, & Solorzano, 2009). Although microaggressions have not been studied specifically as they relate to graduate student sense of belonging, previous research suggests to us that they could negatively impact graduate student sense of belonging. Microaggressions could signal to students that they are not valued (do not matter), are not one of the group (fit), and thereby are not likely to belong in the profession for which they are training. For this study, we decided to focus on microaggressions based on race/ethnicity, gender, and the intersections of these two identities, which are areas where prior research evidence of microaggressions and their negative effects is most robust (Cheryan, Plaut, Davies, & Steele, 2009; Haines, Wallace, & Cannon, 2001; Nguyen & Ryan, 2008; Rowe, 1990; Steele & Aronson, 1995; Sue, 2003).

While microaggressions are likely to constrain sense of belonging, work by Rowe (1990) and other social psychologists (Cohen, Garcia, Apfel, & Master, 2006; Miyake et al., 2010) on social affirmation has shown that providing microaffirmations can assist in the advancement of individuals, especially women and underrepresented minorities. Microaffirmations are defined as small public or private acts signaling support, praise, positive regard, or recognition, which occur when people wish to help others succeed (Rowe, 1990). A few studies have examined microaffirmations in higher education. For example, one qualitative study found that experiencing microaffirmations leads to feelings of empowerment, positive emotions, connectedness, and wellness for graduate students (Koch, Knutson, Loche, & Loche, 2015).

Student demographics and organizational context

A final set of factors that may be relevant to graduate student sense of belonging are student demographics (i.e., gender, race/ethnicity) and organizational contexts (i.e., type of academic program, critical mass, programmatic initiatives). Studies on sense of belonging show that key

demographics such as race/ethnicity and gender influence sense of belonging (Hurtado & Carter, 1997; Johnson et al., 2007; Strayhorn, 2012). For example, Johnson et al. (2007) found that African American, Hispanic/Latino, and Asian Pacific American undergraduate students reported a weaker sense of belonging than White/Caucasian students. Related research on graduate education shows the impact race/ethnicity and gender have on students' experiences as their departments, fields, and institutions are inherently gendered and racialized (Acker, 1990; Baez, 2000; Beagan, 2001; Blake-Beard, Bayne, Crosby, & Muller, 2011; Cole & Griffin, 2013; Griffin, Muñiz, & Espinosa, 2012).

The experiences of women and URM students are also shaped by organizational contexts such as a student's academic program. Much research in this area has focused on science, technology, engineering, and mathematics (STEM) fields. For example, studies found that URM graduate students in STEM are less likely than their white counterparts to have a strong sense of belonging in their field (Carlone & Johnson, 2007; Chemers, Zurbriggen, Syed, Goza, & Bearman, 2011; Malone & Barabino, 2008). STEM graduate programs privilege masculine cultures, meritocratic competition, individual brilliance, and rugged individualism in ways that make women and URM students feel like outsiders (Davis & Finelli, 2007; Gardner, 2008; Hurtado et al., 2011; Museus, Palmer, Davis, & Maramba, 2011; Sallee, 2011; Truong & Museus, 2012). In one study, students of color reported feeling as though their worth as scientists was questioned because of being one of only a few individuals of color in their program or field (Malone & Barabino, 2008). Such challenges are exacerbated for women of color, who feel marginalized because of their gender as well as their race and ethnicity (Ong et al., 2011).

A related organizational context is critical mass of underrepresented minorities or women in certain graduate programs and fields, which has been linked to student success (Cokely, 2002; L. L. Leslie, McClure, & Oaxaca, 1998; Murphy, Steele, & Gross, 2007). Enrollment data showed that in 2014, only about 13% of graduate students in science and engineering identified as underrepresented minorities and about 40% of students were women; however, percentages varied greatly in different fields (National Science Foundation, 2017). In programs with a larger percentage of women or URM students, when students see that there are peers of their same social identities who are succeeding in their program, they are less likely to doubt that they can succeed. Similarly, when students have relationships with others who they identify with and feel are like them in some important way, they are more likely to feel connected to the organization (Tull, Rutledge, Carter, & Warnick, 2012).

A final organizational context that may influence graduate student sense of belonging is participation in organizational initiatives that strive to support their success. One such program is the PROMISE program, Maryland's AGEP. NSF created the AGEP program in 1999 to (a) increase the number of URM students who obtain a graduate degree in the STEM fields and (b) enhance the preparation of URM students for faculty positions in academia (American Association for the Advancement of Science, 2015). AGEP programs host a variety of initiatives for graduate students in an effort to (a) cultivate new graduate students, (b) build a supportive community where students can excel, and (c) promote professional development (Institute for Broadening Participation, 2014). A number of NSF reports and research studies have shown that AGEP programs are successful in improving women and URM graduate students' retention in STEM careers and advancement into faculty careers (George, Malcom, Campbell, Kibler, & Weisman, 2008, 2010; Hrabowski, 2014; Tapia & Lanius, 2000; Tull et al., 2012). One of the major reasons AGEP programs may have succeeded in improving retention is the role they plan in creating stronger professional networks for participants. AGEP programs are not necessarily structured to enhance sense of belonging in each department, as students participate from across one or several campuses. However, AGEP programs acknowledge the distinct challenges faced by URM and women students in STEM fields, help them form community within their interdisciplinary

group, and help them strategize ways to become more connected within their departments—thus, AGEP programs are likely to impact overall sense of belonging to field and institution.

METHODS

We designed an exploratory, quantitative study, reflecting an awareness that very little survey research has been done on graduate student sense of belonging. We conducted a cross sectional survey of graduate students in four public doctoral and comprehensive universities, each of which participated in the PROMISE program (Groves et al., 2004). We wanted to understand the relationship between graduate student sense of belonging and factors that, according to our literature review, are likely to shape it (i.e., professional networks, microaggressions and microaffirmations, demographic factors, and organizational contexts).

DATA SOURCE

We conducted this research with four institutions of higher education in Maryland who participated in the PROMISE program, Maryland's NSF-supported AGEP program. PROMISE is a university system-wide effort for the state of Maryland to support the retention, success, and career development of URM STEM graduate students and postdoctoral scholars by offering financial resources, academic programming, mentorship, and support. The current PROMISE program is led by the University of Maryland Baltimore County (UMBC) and began in Fall 2013 building upon an earlier version of PROMISE that was established in 2002 (PROMISE: Maryland's AGEP, 2015). The main public research universities in the University of Maryland (UM) system organize activities open to all students from the UM system. PROMISE provides URM graduate students with opportunities to connect with peers from several institutions in activities such as Dissertation House, the Research Symposium, and the Summer Success Institute that support graduate student retention and professional growth (Tull et al., 2012). A strength of the PROMISE program is its ability to connect students with additional support mechanisms such as additional faculty mentors and peers from their own and other institutions, many of whom share some of the students' identities (Carter-Veale, Tull, Rutledge, & Joseph, 2016; Tull et al., 2012).

Table 1. University site descriptions

	University of Maryland, College Park	University of Maryland, Baltimore County	University of Maryland, Baltimore	University of Maryland, Eastern Shore
Location	Suburban	Suburban	Suburban	Rural
Carnegie Classification	Research (Very High Activity	Research (High Activity)	Special Focus (Medical)	Master's (Small)
Total Students	37,272	13,908	6,284	4,220
Total Graduate Students (including first year students)	10,614	2,772	5,538	690

Note: All data reported for fall 2013 semester (Source: Integrated Postsecondary Education Data System)

Table 1 provides descriptive data on our four participating institutions, which range in graduate student population from 690 to 10,614. All participants completed a 118-item survey, which was developed by the authors. An extensive review of the literature was conducted on the key constructs: sense of belonging, microaggressions and microaffirmations, and mentoring and professional networks. Our literature review grounded us in the most recent research on these concepts

and also made us aware of instruments that had been validated on our key concepts. If not publically available, survey instruments were requested from researchers.

Our survey items on sense of belonging were adapted from the sense of belonging construct and items in the multi-institutional study of leadership (MSL). The MSL (Multi-Institutional Study of Leadership [MSL], 2017) is an international, multi-year study that examines students' educational needs and identifies elements of the higher education environment that contribute most significantly to leadership outcomes. Survey items on mentoring, professional relationships, and networks were taken from a previous instrument developed by the authors on professional networks (Niehaus & O'Meara, 2015; O'Meara & Campbell, 2011; O'Meara, Rivera, Kuvaeva, & Corrigan, 2017). Survey items and constructs of microaggressions and microaffirmations were developed from the work of Rowe (1990) and Sue (2010) assessing experiences with microaggressions and microaffirmations. Table 2 shows the individual survey items included in each construct along with responses and standard deviations.

Table 2. Constructs and descriptive statistics

Constructs	Survey Item	Mean	Std. Dev.
Sense of belonging	The sense of fit between my values and those of my unit.	3.59	.95
	Faculty in my unit care about my personal well-being.	3.58	1.01
	Graduate students in my unit care about my personal well-being.	3.76	.93
	I feel valued as a person in my department/unit.	3.43	1.07
	I feel I belong on this campus.	3.50	1.06
	Support I have received from faculty members in my unit.	3.80	1.04
	Support I have received from graduate students in my unit.	3.95	.94
Professional networks	I have relationships with faculty on campus that have supported my academic progress.	3.85	.98
	I have relationships with faculty on campus that support me personally.	3.41	1.10
	My core discussion network provides helpful feedback on my research.	3.68	.90
	My core discussion network is an important source of professional advice.	3.79	.95
	My core discussion network lets me know of professional opportunities.	3.60	.99
	Individuals at this institution have made an effort to connect me with important people in my field.	3.42	1.10
	I feel isolated in my program. (reverse coded)	3.25	1.20
Mentoring	I have been effectively mentored by someone in my unit.	3.51	1.19
	I can count on my mentor even after difficult conversations.	3.60	1.09
	My mentor has empowered me to succeed academically.	3.64	1.08
	My mentor helped me to: Be open to new experiences.	3.53	1.03
	My mentor helped me to: Develop problem solving skills.	3.59	1.02
	My mentor helped me to: Identify areas for self-improvement.	3.58	1.01

Constructs	Survey Item	Mean	Std. Dev.
Microaggressions (second-level latent variable)	Microaggressions with regard to race	2.10	.99
	Microaggressions with regard to gender	2.06	.94
	Microaggressions with regard to sexuality	1.97	.91
	Microaggressions with regard to social class	2.04	.94
	Microaggressions with regard to location of birth	2.05	.98
	Microaggressions with regard to religion	2.02	.94
	Microaggressions with regard to age	2.08	.92
Microaffirmations (second-level latent variable)	Microaffirmations with regard to race	3.15	.80
	Microaffirmations with regard to gender	3.18	.81
	Microaffirmations with regard to sexuality	3.09	.80
	Microaffirmations with regard to social class	3.11	.78
	Microaffirmations with regard to location of birth	3.13	.78
	Microaffirmations with regard to religion	3.08	.78
	Microaffirmations with regard to age	3.12	.79

Response scales for items are 1 (strongly disagree or very dissatisfied) to 5 (strongly agree or very satisfied)

Prior to administration, the instrument was tested with five individuals that met the criteria for participation in the study (graduate students at a University of Maryland institution) to determine the survey items' validity. Items were clarified based on their feedback, and items that were repetitive or less central to the study's purpose were removed.

Data Collection

The survey was administered to graduate students at four University of Maryland institutions, which participated in the PROMISE program. Researchers worked with a liaison at each participating institution. Project liaisons were asked to send an e-mail to all graduate students. The e-mail contained information about the study, the link to access the survey instruments, and a note that only second-year master's students and beyond were eligible to participate. The survey was sent out in the fall semester, and we decided to exclude first-year students from the pool, as a few weeks would not be enough to develop a sense of belonging within a new academic program. The invitation e-mail also included details about incentives for participation. Participants who completed the survey were placed in a lottery for Amazon gift certificates; winners were selected for each institution.

Sample

A total of 1,533 participants completed the survey. The final response rate was 26.8%. Table 3 includes demographic characteristics of the survey participants. The largest number (n = 935; 61.8%) of survey respondents were graduate students at the University of Maryland - College Park (UMCP); 22.9% of participants (n = 346) were enrolled at the University of Maryland - Baltimore County (UMBC), 10.6% were from the University of Maryland - Baltimore (UMB) (n = 160), 4.7% were from the University of Maryland - Eastern Shore (n = 71), and 1.4% (n = 21) did not indicate their institution. Women were the majority of participants, and represented 57.2% of the sample (n = 847). Over half (66.4%) of participants identified as White (n = 1,018) and 12.5% (n = 192) identified as students traditionally underrepresented in STEM fields; 4.9% (n = 75) were men of color and 7.5% (n = 115) were women of color. Sixty seven percent of the participants (n = 1,029) were enrolled in STEM graduate programs. Approximately 13% of participants (n = 197) indicated that they had participated in some form of programming

administered by or were affiliated with the PROMISE program. Men and students of color were underrepresented, and STEM majors were overrepresented in our sample.

Table 3. Respondent demographics

Gender	Male	42.8%
	Female	57.2%
Race	White	66.4%
	URM	12.5%
	Race not reported	21.1%
	Men of Color	4.9%
	Women of Color	7.5%
STEM	STEM	67.1%
	Non-STEM	17.8%
	Not reported	15.1%
PROMISE	PROMISE	13.1%
	Non-PROMISE	86.9%
Institutions	University of Maryland Eastern Shore	4.7%
	University of Maryland College Park	61.8%
	University of Maryland Baltimore	10.6%
	University of Maryland Baltimore County	22.9%

Missing data excluded

Analysis

After creating a report of descriptive statistics on each item, we conducted multi-group latent variable path analysis (LVPA) using a two-step procedure. The initial model is presented in Figure 1. First, we tested the construct validity of each latent factor using Confirmatory Factor Analysis (CFA). In this step we determined item loadings on each latent factor: microaggressions, microaffirmations, professional networks, mentoring, and sense of belonging. Two of the academic environment conditions factors – microaggressions and microaffirmations – were treated as second-level latent constructs consisting of items grouped by perceptions with respect to demographic characteristics such as race/ethnicity, gender, sexuality, social class, location of birth, religion, and age. As a confirmatory method, CFA allowed us to test the theoretical model (Hancock & Mueller, 2013).

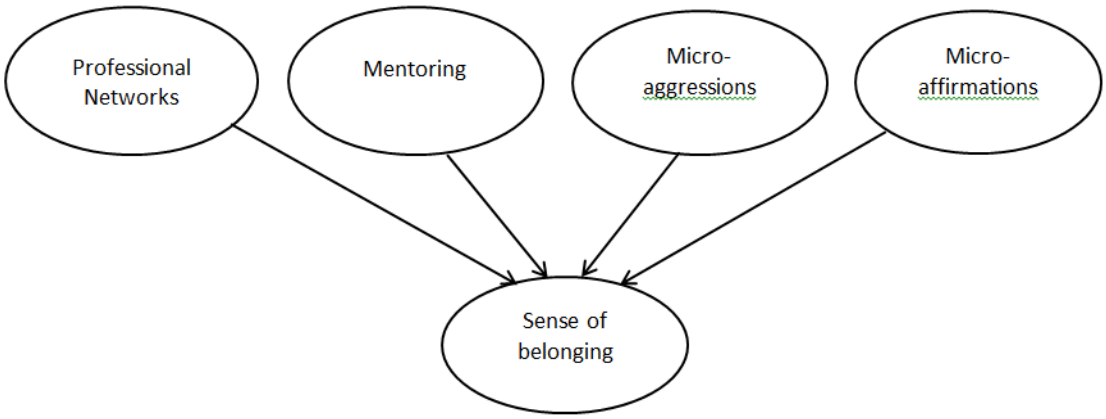

Figure 1. Initial model

Next, as a second step, we ran Structural Equation Modeling (SEM) on the final measurement model. The SEM allowed us to test direct and indirect effects of multiple latent variables on each other, i.e., a priori theoretically driven structural links among them (Byrne, 2013; Hancock & Mueller, 2013; Kline, 2016). Finally, we conducted multi-group latent variable path analyses by gender, race/ethnicity, STEM affiliation, critical mass of women, and participation in the PROMISE program, to see if any of the identified parameters (i.e., structural paths) differed across groups or were invariant.

Analyses were run using Mplus software. Because variables used in the study were treated as categorical, we used weighed least squares means and variance adjusted method (WLSMV): "a robust estimator which does not assume normally distributed variables and provides the best option for modeling categorical or ordered data" (Brown, 2006 as cited in Proitsi et al., 2011, p. 435). When determining model fit, WLSMV difference testing was done using the DIFFTEST option. In the WLSMV difference testing across groups, a non-significant result indicates that constraining the parameter to be equal in both groups does not significantly worsen model fit, meaning that the parameter is not different in both groups. This allowed us to determine variability of effects among latent variables across groups by demographics, organizational locations, and participation in the PROMISE program.

Besides the difference testing, we used Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). The use of multiple measures allowed us to have a better understanding of the model fit. Although no perfectly defined standards for these measures exist, we rely on empirically derived recommendations (Hu & Bentler, 1999). CFI values of 0.95 and higher indicate an excellent model fit, although values greater than 0.90 are also considered suitable. RMSEA values of 0.06 and lower are typically considered appropriate (Hu & Bentler, 1999).

Limitations

This study held many strengths not the least of which included an explicit focus on graduate sense of belonging, the use of rigorous quantitative analysis, and careful analysis of previously unstudied contributing factors to sense of belonging. Despite this, all research has limitations, including this study. The most important limitation of our study is the response rate, which was lower than we had hoped. Student surveys range in response rate. For example, a report by the National Survey of Student Engagement (2016) indicated that response rates of their 2016 survey ranged by institution from 5% to 77%, with an average of 29%. However, even relatively low response rates have been found to produce reliable estimates, and total numbers of respondents

are considered to be more important than the response rates. For instance, as few as 25 to 75 respondents (Fosnacht, Sarraf, Howe, & Peck, 2017) or 50 respondents (Pike, 2012) can provide reliable unbiased results. Except for one institution (n=71), the rest of institutions in our sample had between 160 and 935 respondents, with a total of 1,533 respondents.

A second limitation is the lack of representativeness of our sample, which limits our ability to generalize to the larger population of graduate students. Because this social science research was sponsored by the PROMISE program in collaboration with graduate deans on each campus, there was an emphasis on collecting data from STEM graduate students in their second year and beyond. Although the survey invitation was sent to all graduate students, most participating campuses had more STEM graduate programs. Because we noted the research effort was supported by PROMISE and NSF, we believe the response favored STEM students. Nevertheless, we believe that our study makes an important contribution to the literature by exploring the relationship between key factors influencing sense of belonging, a concept that is understudied in graduate student research. Moreover, our study makes a unique contribution to the literature by examining the relationships between sense of belonging and microaggressions and microaffirmations for different groups of students. This is a timely issue given institutional interest in creating more inclusive academic environments for diverse students (Kezar & Eckel, 2007; Williams, Berger, & McClendon, 2005).

RESULTS

DESCRIPTIVE STATISTICS ON KEY CONSTRUCTS

Each item (Table 2) was measured using a 5-point Likert-type response scale, and the means of the items were used as the overall measures of the constructs (Table 4). One-way ANOVA analyses were conducted to determine significant differences in these constructs based on gender, race, STEM department, critical mass of women, and participation in PROMISE. Female students were more likely than male students to be satisfied with their professional relationships. URM students were more likely than non-URM students to experience microaggressions. Students from STEM departments were less likely than students from non-STEM departments to feel sense of belonging and to experience microaffirmations. Students from disciplines with a critical mass of women were more likely than students from disciplines with no critical mass of women to be satisfied with their professional relationships, less likely to experience microaggressions, and more likely to experience microaffirmations. PROMISE participants were less likely than non-participants to feel sense of belonging, more likely to experience microaggressions, and less likely to experience microaffirmations. It is important to contextualize this last finding by noting that PROMISE participants were also more likely to be in STEM fields, with lower critical mass of women, and by virtue of participation in PROMISE, may have had greater awareness of microaggressions and higher expectations for a sense of belonging than their peers.

Table 4. Descriptive statistics on key constructs, means, and standard deviations

Construct	Gender		Race		STEM department		Critical Mass of Women		PROMISE		All respondents
	Female	Male	URM	non-URM	STEM	Non-Stem	CMW	Non-CMW	Participants	Non-participants	
Sense of Belonging	3.68(.70)	3.65(.70)	3.63(.72)	3.72(.70)	3.63(.71)*	3.76(.71)*	3.69(.71)	3.63(.70)	3.56(.65)*	3.68(.72)*	3.66(.71)
Professional Relationships	3.61(.72)*	3.53(.75)*	3.55(.75)	3.60(.73)	3.59(.75)	3.53(.71)	3.65(.71)***	3.49(.75)***	3.55(.68)	3.58(.75)	3.57(.74)
Microaggressions	2.00(.87)	2.08(.92)	2.04(.83)*	1.89(.84)*	2.06(.90)	2.06(.92)	1.89(.82)***	2.26(.95)***	2.39(.88)***	1.99(.89)***	2.04(.89)
Microaffirmations	3.14(.71)	3.11(.80)	3.23(.79)	3.16(.72)	3.06(.75)***	3.33(.73)***	3.22(.71)***	3.00(.78)***	3.01(.72)*	3.14(.75)*	3.12(.75)

Response scales for items are 1 (strongly disagree or very dissatisfied) to 5 (strongly agree or very satisfied)

Structural Model

Due to high intercorrelations between our professional networking construct and our mentoring construct, we built another second-level latent construct – professional relationships – that incorporated the two initial latent constructs. Extant research supports the linkage between the constructs of professional networks and mentoring (Higgins & Kram, 2001; Quinlan, 1999).

After construct validation, we applied SEM to test the structural links between the sense of belonging construct and the other latent factors: professional relationships (professional networks, mentoring) and academic environment conditions (microaggressions, and microaffirmations). Table 5 shows standardized loadings for the final CFA model.

Table 5. Item loadings for the final six factor CFA model

Constructs	Survey Item	Standardized item loading
Sense of belonging	The sense of fit between my values and those of my unit.	0.683
	Faculty in my unit care about my personal well-being.	0.836
	Graduate students in my unit care about my personal well-being.	0.661
	I feel valued as a person in my department/unit.	0.719
	I feel I belong on this campus.	0.599
	Support I have received from faculty members in my unit.	0.812
	Support I have received from graduate students in my unit.	0.668
Professional networks	I have relationships with faculty on campus that have supported my academic progress.	0.860
	I have relationships with faculty on campus that support me personally.	0.777
	My core discussion network provides helpful feedback on my research.	0.674
	My core discussion network is an important source of professional advice.	0.758
	My core discussion network lets me know of professional opportunities.	0.668
	Individuals at this institution have made an effort to connect me with important people in my field.	0.669
	I feel isolated in my program. (reverse coded)	0.671
Mentoring	I have been effectively mentored by someone in my unit.	0.908
	I can count on my mentor even after difficult conversations.	0.917
	My mentor has empowered me to succeed academically.	0.934
	My mentor helped me to: Be open to new experiences.	0.843
	My mentor helped me to: Develop problem solving skills.	0.860
	My mentor helped me to: Identify areas for self-improvement.	0.823
Professional Relationships	Professional Networking	0.928
	Mentoring	0.757

Constructs	Survey Item	Standardized item loading
Microaggressions (second-level latent variable)	Microaggressions with regard to race	0.957
	Microaggressions with regard to gender	0.927
	Microaggressions with regard to sexuality	0.903
	Microaggressions with regard to social class	0.958
	Microaggressions with regard to location of birth	0.952
	Microaggressions with regard to religion	0.919
	Microaggressions with regard to age	0.945
Microaffirmations (second-level latent variable)	Microaffirmations with regard to race	0.949
	Microaffirmations with regard to gender	0.945
	Microaffirmations with regard to sexuality	0.932
	Microaffirmations with regard to social class	0.948
	Microaffirmations with regard to location of birth	0.952
	Microaffirmations with regard to religion	0.916
	Microaffirmations with regard to age	0.943

Sense of belonging and academic environment conditions

Academic environment conditions were found to influence graduate sense of belonging. Professional relationships contributed the most to sense of belonging: a one unit increase in professional relationships caused, on average, a 0.755 unit increase in sense of belonging, holding all else constant. The effects of microaggressions and microaffirmations on sense of belonging were smaller compared to the effect of professional relationships (-0.132 and 0.063, respectively); however, we retained these factors in the model because they improved the model fit and we were interested in testing these factors with respect to group differences later in the analysis.

Chi-square test for difference testing remained significant ($\chi^2 = 7.120$, $df = 2$, $p = .028$); however, compared to other tested models the final model yielded smaller chi-square values and smaller standard errors, and improved model fit indices resulting in RMSEA = .074 and CFI = .894. RMSEA measure resulted in a value higher than the suggested cut-off which can be explained by small degrees of freedom (*df*) in the model (Kenny, Kaniskan, & McCoach, 2014).

Group analyses

After we built the final structural model, we ran SEM analyses by groups to reveal any existing differences in the structural links of key factors by gender, race/ethnicity, STEM affiliation, critical mass of women, and participation in the PROMISE program. Figure 2 shows the final model. Group comparisons on the effects of academic environment conditions on sense of belonging are noted in Table 6.

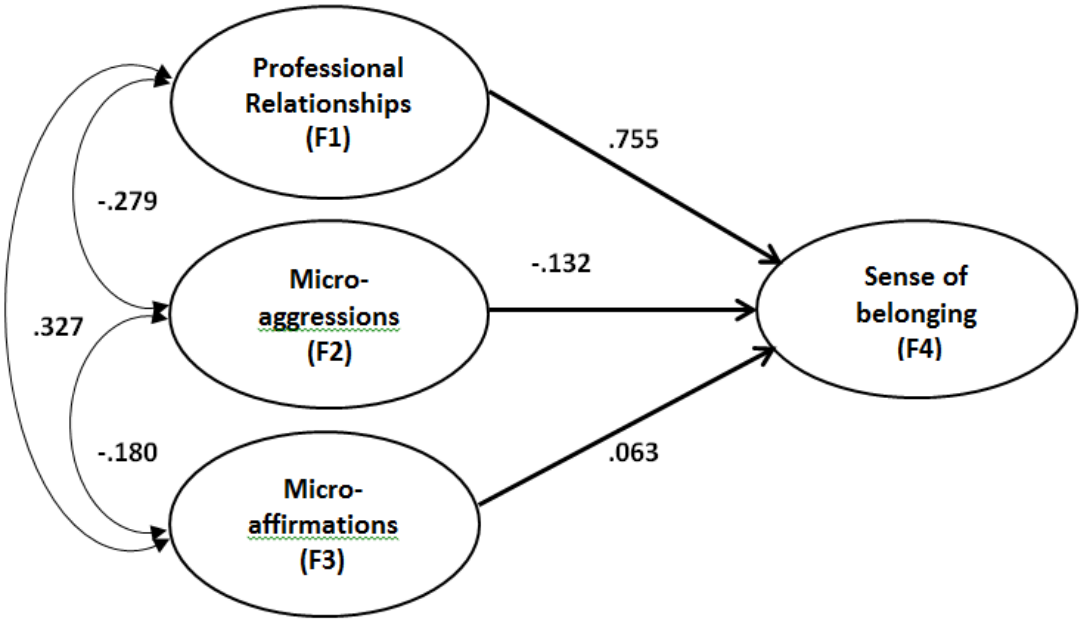

Figure 2. Final model of latent factors' effects on students' sense of belonging

Table 6. Effects of academic environment conditions on sense of belonging, unstandardized coefficients, and standard errors

Construct	Gender		Race	STEM department		Critical Mass of Women		PROMISE
	Female	Male	URM/Non-URM	STEM	Non-Stem	CMW	Non-CMW	Participants/ Non-participants
Professional Relationships	.725(.028)	.725(.028)	.801(.041)	.779(.029)	.779(.029)	.822(.036)	.627(.040)	.733(.048)
Microaggressions	-.152(.022)	-.074(.022)	-.119(.021)	-.122(.019)	-.060(.031)	-.119(.017)	-.119(.017)	-.108(.017)
Microaffirmations	.060(.021)	.060(.021)	.083(.025)	.023(.026)	.199(.046)	.066(.023)	.066(.023)	.068(.021)

Sense of belonging and demographics. The final model of group comparison by gender resulted in a good model fit with indices of RMSEA = .067 and CFI = .910. Non-significant chi-square test for difference testing (χ^2 = 5.417, *df* = 4, *p* = .247) indicated that constraining the effects of professional relationships and microaffirmations on sense of belonging to be equal in both groups did not significantly worsen model fit. That is, female and male students did not differ in the effect of professional relationships (mentoring and networks) and microaffirmations on their sense of belonging: *B* = .725 and *B* = .060, respectively. However, female students were more likely than male students to experience the effect of microaggressions on their sense of belonging: *B* = -.152 and *B* = -.074, respectively. That is, when experiencing microaggressions female students were less likely than men to feel sense of belonging. Unstandardized coefficients and standard errors for the final model by gender are presented in Table 6.

The final model of group comparison by race/ethnicity resulted in a good model fit with indices of RMSEA = .060 and CFI = .925, with all of the parameters constrained to be equal in both groups, i.e. URM and non-URM students did not differ in the effect of their professional relationships, microaggressions and microaffirmations on their sense of belonging (Table 6).

Sense of belonging and organizational locations. Students from non-STEM departments were more likely than students from STEM departments to report and experience positive effects of microaffirmations on their sense of belonging (*B* = .199 and *B* = .023, respectively), and less likely to report and experience negative effects of microaggressions on their sense of belonging (*B* = -.060 and *B* = -.122, respectively) (Table 6). The final model of group comparison by STEM resulted in a good model fit with indices of RMSEA = .063 and CFI = .911. Based on non-significant chi-square test for difference testing (χ^2 = 0.310, *df* = 1, *p* = .578), we retained the final model with the effect of professional relationships on sense of belonging being equal in both groups, STEM and non-STEM.

Students from disciplines with a critical mass of women were more likely than students from disciplines with no critical mass of women to report and experience positive effects of professional relationships on their sense of belonging (*B* = .822 and *B* = .627, respectively) (Table 6). Non-significant chi-square test for difference testing (χ^2 = 2.197, *df* = 2, *p* = .333) indicated that constraining two parameters – microaggressions and microaffirmations – to be equal in both groups did not significantly worsen model fit. The final model of group comparison by disciplines with critical mass of women produced fit indices of RMSEA = .069 and CFI = .900. Thus, professional relationships impact sense of belonging regardless of microaffirmations and microaggressions, though students in low critical mass disciplines are less likely than those in higher critical mass disciplines to experience microaffirmations or positive professional relationships.

The final model of group comparison by PROMISE participation resulted in a good model fit with indices of RMSEA = .060 and CFI = .931. Non-significant chi-square test for difference testing (χ^2 = 4.837, *df* = 3, *p* = .184) indicated that constraining all of the parameters to be equal in both groups did not significantly worsen model fit. Therefore, we retained the final structural model with all parameters constrained, i.e., PROMISE participants and non-participants did not differ in the effect of their professional relationships, microaggressions, and microaffirmations on their sense of belonging (Table 6).

DISCUSSION AND IMPLICATIONS

In this exploratory study, we sought to understand relationships that might exist between graduate student sense of belonging, professional relationships, and microaggressions and microaffirmations. We were also interested in how demographics and organizational contexts impacted graduate student sense of belonging. Our findings suggest that professional relationships matter most to graduate student sense of belonging, a finding not surprising given the large role faculty-student relationships

play in graduate student retention and advancement (Curtin et al., 2013; Gardner, 2007; Girves & Wemmerus, 1988; Golde, 2000). Graduate students' sense that they had ongoing mentors and positive experiences with others in their departments was more important to their sense of belonging than reported microaffirmations or microaggressions, though they also played a role. It was encouraging to see that professional relationships had this effect on sense of belonging independent of gender or race; professional relationships mattered to graduate student sense of belonging for everyone.

However, all conditions for graduate students were not created equal. Descriptive statistics indicated that female students were more likely than male students to be satisfied with their professional relationships. Once we examined relationships between factors in the SEM we found female students more likely than male students to experience the effect of microaggressions on their sense of belonging. This finding is consistent with prior research showing that feelings of isolation, alienation, and lack of support negatively impact women's experiences and success in graduate school (Carlone & Johnson, 2007; Fox, 2001; Litzler, Lange, & Brainard, 2005; Nerad & Stewart, 1991; Patton, 2009; Subramanian & Wyer, 1998; Welde & Laursen, 2008).

Our findings also confirmed previous research on the experiences of URM students (Clark et al., 2012; Gomez et al., 2011; Maton et al., 2011; Nadal et al., 2010; Solorzano et al., 2000) in that URM students were more likely than non-URM students to experience micro-aggressions. Our SEM analysis showed that URM students and non-URM students did not differ in how academic environments (i.e., professional relationships, microaggressions and microaffirmations) affected their sense of belonging.

In regard to organizational contexts, our findings showed that there were important differences based on STEM vs. non-STEM, critical mass of women, and PROMISE participation. The ecosystem of non-STEM programs seemed to have more facilitators of sense of belonging than the ecosystem of STEM programs. Non-STEM students were more likely to report sense of belonging and more likely to experience microaffirmations. SEM analysis showed that non-STEM students also experienced more positive effects of microaffirmations and less negative effect of microaggressions on their sense of belonging. Closely related is our analysis of disciplines with critical mass of women, as many, though not all, STEM programs have a low critical mass of women. We found that students from disciplines with a low critical mass of women were not only less likely than their peers from disciplines with a critical mass women to be satisfied with their professional relationships, they were also less likely to experience positive effects of professional relationships on their sense of belonging. Students from these disciplines with a low critical mass of women were also more likely to experience microaggressions, and less likely to experience microaffirmations. These findings support previous research about the challenges graduate students, and particularly women and URM students, face in STEM departments and/or departments with a low critical mass of women (De Welde & Laursen, 2011; Malone & Barabino, 2008; Museus et al., 2011).

Our findings regarding PROMISE participation, however, seemed at first contrary to what may have been expected. The goal of the PROMISE program is to build a supportive community for its participants, which may lead one to expect that these students are more likely to feel sense of belonging, less likely to experience microaggressions and more likely to experience microaffirmations. However, our findings showed that the opposite was the case: PROMISE participants reported lower sense of belonging, were more likely to experience microaggressions, and were less likely to experience microaffirmations. These results can be interpreted in several ways. First, as noted earlier, PROMISE participants were more likely to identify as women or URM graduate students and be in STEM fields with lower critical mass of women, which may explain why these students experienced more microaggressions, less microaffirmations, and a lower sense of belonging. Second, PROMISE participants may be more aware of microaggressions because of having an outlet to reflect on and discuss the challenges they are facing in their programs. Previous qualitative research on the PROMISE program suggests such enhanced awareness is part of the program (O'Meara, Griffin, Nyunt, & Loun-

der, 2017). Because of experiencing close professional relationships and microaffirmations within the PROMISE program, students may have had higher expectations of similar relationships and interactions with others in their departments. If this was not the case, students may have been more disappointed in the professional relationships and interactions with others that they experienced during graduate school. Being more aware of microaggressions and being disappointed in professional relationships and interactions with others within their departments may have led to students' lower sense of belonging. Third, one of the goals of the PROMISE program is to help create a "third space" for graduate students (O'Meara et al., 2017), a programmatic home that is of their university, but not necessarily their program, where sense of belonging can be fostered among individuals of similar social identity backgrounds. Such programs, however, cannot erase or change what is happening in students' departments and replace students' need for a sense of belonging in their program and with their program faculty and students.

CONCLUSION

This study explored the factors that influence graduate student sense of belonging. Institutions benefit from having a better understanding of the factors that influence graduate student sense of belonging as they develop programmatic initiatives or change graduate program structures and cultures in hopes of improving graduate student retention and career advancement. Our findings indicate that helping students develop professional networks may be an effective way to support graduate student sense of belonging. More also needs to be done to support women graduate students and address microaggressions that URM students face.

This work has several implications for future research. First and foremost, we believe sense of belonging is an important area for future graduate education research and should be studied through survey research with a larger sample of U.S. students than the current study. Sense of belonging is relevant to graduate education worldwide. Future studies might explore graduate student sense of belonging in different national contexts and the role culture plays in shaping it. Second, we think it would be important to follow graduate students, assessing changes in their sense of belonging over the course of their programs. For example, it is important to track whether a reduced sense of belonging at any particular phase of graduate education is associated with decisions to leave graduate programs as is suggested in prior qualitative work (Gardner & Barker, 2015; Gardner & Barnes, 2007; Golde, 1998, 2000).

In terms of implications for practice, graduate programs must think strategically about enhancing sense of belonging in ways appropriate to the distinct culture and nature of graduate education. Given most graduate education occurs in large universities and the primary organizational home for students will be their department, not the university, efforts should be made to help departments and colleges strengthen inclusion and support within academic programs (Jaeger et al., 2106; O'Meara et al., 2014). For example, departments can make efforts to support sense of belonging through creating community-oriented peer networks of students, transparent policies, and access to information about resources and opportunities (Jaeger et al., 2016; O'Meara et al., 2014).

On the other hand, despite the best efforts of faculty and administrators there are some women and URM graduate students who will no doubt experience some disconnection or isolation within their department if they are "the only" women or URM student there and if there are not many faculty role models in their department of the same identity. Programs such as PROMISE can enhance sense of belonging within the field of higher education and connect people within STEM fields so they identify with the profession, in a sort of third space (O'Meara et al., 2017). Likewise, programs such as the Mentor Training Core of the National Research Mentoring Network (NRMNet, 2017) are critical to establish the kind of authentic and productive faculty-graduate student relationships that can foster sense of belonging.

Inherent tensions exist when working to diversify graduate programs and, at the same time, strive to enhance sense of belonging. Social science researchers have shown, for example, that as an organization becomes more diverse, there is often a drop in social trust (Putnam, 2007). There can even be an increase in people trying to game each other (Halper, 2015). Homogeneous groups, while less creative, can be easier spaces to create sense of belonging—in part because of implicit biases (Glaeser, Laibson, Scheinkman, & Soutter, 2000; Putnam, 2007). People have a tendency to put others into categories such as the "in-group" and "out-group" based on assumptions made about the characteristics of those who "belong". If a particular STEM discipline, such as Physics, is widely assumed to be a place only for "brilliant" students, as has been found in some social science studies, and brilliance is associated with white male students (Knobloch-Westerwick, Glynn, & Huge, 2013; Leslie, Cimpian, Meyer, & Freeland, 2015; Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012); an African American women graduate student may be assumed by others, and somewhat by her own internalized gender norms, to "not belong there" and may constantly feel a need to prove herself. Being with other women of color physics students in a program like PROMISE might help her feel more like an insider, but only generally as a scientist, and in higher education (Gardner, 2010; George et al., 2008, 2010; Golde, 1998, 2000; Hrabowski, 2014; O'Meara et al., 2017; Tapia & Lanius, 2000; Tull et al., 2012). It is still important that she finds a space within her academic department and field where she feels supported and part of a community that sees her as belonging. This is why it is so important to integrate aspects of PROMISE into department structures of mentoring and graduate student support (Griffin et al., 2015; Jaeger et al., 2016; O'Meara et al., 2014; O'Meara, Knudsen, & Jones, 2013). Thus, those leading graduate education reform might invest in professional development for faculty and student leaders on strategies to enhance sense of belonging within graduate programs, even as they continue to foster networks and "homes away from home" for graduate students who find it harder to find sense of belonging navigating graduate education on their own.

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BIOGRAPHY

Dr. KerryAnn O'Meara is Professor of Higher Education, Director of the ADVANCE Program for Inclusive Excellence, Affiliate Faculty in Women's Studies and Associate Dean for Faculty Affairs and Graduate Studies in the College of Education at the University of Maryland, College Park. Dr. O'Meara's research examines faculty careers and academic rewards systems with a particular focus on organizational practices that support and limit the full participation of women and URM faculty and the legitimacy of diverse forms of scholarship in the academy. Dr. O'Meara's work has been published in the Journal of Higher Education, Gender and Education, American Educational Research Journal, Review of Higher Education, and Research in Higher Education, among other venues. Her work has been supported by the National Science Foundation, Kettering Foundation, Luce Foundation, College Board, TIAA-CREF and Teagle Foundations.

Dr. O'Meara consults with higher education institutions on promotion and tenure policy reform, faculty development programs, and organizational practices that sustain equitable workloads. Dr. O'Meara is PI of an NSF ADVANCE IHE-PLAN grant, the Faculty Workload and Rewards Project, to work with academic departments in MD, MA and NC state systems of higher education to design for greater equity in academic workload and reward systems. In the area of graduate education she has studied department structures and cultures that support graduate student agency, emotional and social intelligences displayed in faculty-student advising relationships, and how disciplinary cultures shape the sense of belonging new entrants feel in the academy.

Kimberly A. Griffin is an Associate Professor at the University of Maryland. Prior to becoming a faculty member, she served as a higher education administrator and student affairs professional, working in undergraduate and graduate admissions, promoting diverse and hospitable learning environments, and new student orientation. Dr. Griffin's diverse interests and background have provided the opportunity to become skilled in advanced quantitative and qualitative methods, as well as the integration of these strategies in mixed methods research. Throughout her career, she has contributed to multiple projects related to access and equity in higher education, examining the diverse experiences of Black students and faculty, the impact of campus climate, and how mentoring relationships influence student and faculty success. Much of her current work focuses on exploring efforts to increase diversity in the professoriate, including studies addressing access to graduate education for women and men of color, the training experiences of underrepresented students, and career development in graduate education.

Professor Griffin is a recognized scholar in the area of higher education access and equity research. She was the recipient of the 2013 Early Career Award from the Association for the Study of Higher Education, and was identified as an Emerging Scholar by ACPA, College Student Educators International, in 2010. She serves on multiple editorial boards, and is the Incoming Editor for the *Journal of Diversity in Higher Education.* After completing her undergraduate work in Psychology at Stanford University, Dr. Griffin received her Master's degree from the University of Maryland. Her doctoral work in higher education and organizational change was completed at UCLA.

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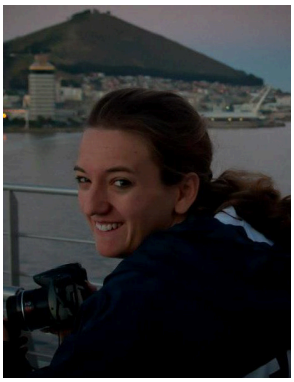

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Mrs. Nyunt is passionate about connecting theory and research with practice and policy in an effort to create inclusive higher education communities and prepare students for meaningful lives in a global community. Her research interests include the internationalization of higher education; study abroad; and women, underrepresented minority, and international faculty and student affairs staff careers. Mrs. Nyunt is an active member of ACPA - College Student Educators International and currently serves as chair of the Commission for Global Dimensions of Student Development.

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