Disrupting Ruling Relations:

The Role of the PROMISE Program as a Third Space

KerryAnn O'Meara, Ph.D.
Professor, Higher Education
University of Maryland

Kimberly A. Griffin, Ph.D.
Associate Professor, Student Affairs
University of Maryland

Gudrun Nyunt, Ph.D.
Visiting Assistant Professor, Higher Education
Northern Illinois University

Andrew Lounder, Ph.D.
Director of Special Projects, Programs & Research
Association of Governing Boards of Universities and Colleges

©American Psychological Association, [2018]. This paper is not the copy of record and may not exactly replicate the authoritative document published in the APA journal. Please do not copy or cite without author's permission. The final article is available, upon publication, at: DOI: 10.1037/dhe0000095"

Disrupting Ruling Relations: The Role of the PROMISE Program as a Third Space

Abstract: Applying the concept of ruling relations - everyday norms, assumptions, logics, and social interactions that structure people's everyday lives (Smith, 1999) - to STEM URM graduate student experiences provides a unique and important way to understand how inequality can be integrated into the graduate student socialization process. We used an ethnographic case study approach to understand the challenges URM students experience in STEM graduate programs and how an NSF-funded program called PROMISE created to support the retention and advancement of URM students, countered these ruling relations. We found that students experienced isolation and a lack of community, an environment that stressed individualism and competition, and hierarchical structures in their STEM departments that made them question whether they belonged and could succeed. The PROMISE program opposed these ruling relations by operating as a "third space" for graduate participants, a space that was neither work nor home. This "third space" was experienced as neutral territory where hierarchy was de-emphasized and there was a critical mass of other URM STEM students with whom to find community, affirmation, and support. As a "third space", the PROMISE program fostered different rules of engagement - community, affirmation, and egalitarianism - which ran counter to participants' experiences in their home department. The article concludes with recommendations for practice.

Keywords: graduate education; third space; ruling relations; underrepresented minority; STEM

Disrupting Ruling Relations: The Role of the PROMISE Program as a Third Space

It is well known that racial minority students are underrepresented in STEM fields[1] at the graduate level (Council of Graduate Schools, 2016). Ten year completion rates for underrepresented minority (URM) students (i.e., African Americans, Hispanics, American Indians, Alaska Natives, and Native Hawaiians or other Pacific Islanders) are lower than for white students (Council of Graduate Schools, 2016), and although all graduate students' interest in academic careers decreases as they progress toward their degrees, this decrease is more pronounced for URM STEM students, particularly URM women (Gibbs, McGready, Bennett, & Griffin, 2014).

Many explanations have been offered for URM STEM students' lower retention and persistence, including a lack of faculty mentoring, presumptions of student incompetence, and subtle and overt racism (Carlone & Johnson, 2007; Gutiérrez y Muhs, Niemann, González, & Harris, 2012; Robinson, McGee, Bentley, Houston, & Botchway, 2016). Although these factors are important, one of the most intangible and pervasive reasons for the lower retention and success of URM graduate students may lie in another explanation: the ruling relations of many STEM programs. Ruling relations, a term coined by sociologist and feminist scholar Dorothy Smith (1999, 2005), are everyday norms, assumptions, logics, and social interactions that structure people's lives independent of person, place, or time. Created by the dominant group, ruling relations reinforce notions of privilege and hierarchy and often exclude newer groups from entering an organization, field, community, or social group (Smith, 1999). Ruling relations inform and contribute to campus climate, "the current attitudes, behaviors, and standards and practices of employees and students of an institution" (Rankin & Reason, 2008, p. 264). Yet,

[1] We use the National Science Foundation's broad definition for STEM disciplines which includes not only science, technology, engineering, and mathematics, but also social sciences (see www.nsf.gov for a detailed list of all STEM disciplines).

ruling relations are distinct; they are the norms, assumptions, and logics that shape the climate, informing the organizing practices that permeate everyday social interactions and relationships.

Just as an old wool rug has many different layers of colored yarn intricately woven together, STEM fields have disciplinary norms and socialization processes woven together with ruling relations that can exclude newer entrants to their fields. Studies have found that STEM graduate programs privilege masculine cultures, meritocratic competition, individual brilliance, and rugged individualism (Davis & Finelli, 2007; Gardner, 2008; Hurtado et al., 2011; Museus, Palmer, Davis, & Maramba, 2011; Sallee, 2011). Many studies on graduate students in science have highlighted students' perceptions of their disciplines as endorsing an all-consuming commitment to science and the laboratory, competition and an assertive communication style, and a hierarchical relationship between the principal investigator and trainees (Fuhrmann, Halme, O'Sullivan, & Lindstaedt, 2011; Gibbs & Griffin, 2013; Mason, Goulden, & Frasch, 2009). Graduate students thus learn that to be a good scientist means to be individualistic and competitive (Griffin, Gibbs, Bennett, Staples, & Robinson, 2015).

Much research has documented how these cultures and organizational practices of STEM programs can pose constraints for women and URM students (Gardner, 2008; Gibbs & Griffin, 2013; González, 2006; Jaeger, Haley, Ampaw, & Levin, 2013; Johnson, 2007; Ong, Wright, Espinosa, & Orfield, 2011). Gardner (2008) and Sallee (2011) found that women and URM STEM doctoral students were discouraged by norms of individualism, competition, lack of community, and lack of appreciation for different identities and experiences. Women and URM graduate students may also experience STEM cultures and organizational practices as conflicting with their beliefs, identities, and life goals (González, 2006; Griffin et al., 2015; Jaeger et al., 2013; Ong et al., 2011). Across multiple studies, URM students describe faculty and peers as unlikely to recognize them as legitimate members of the community (Carlone & Johnson, 2007;

Griffin et al., 2015; Ong, 2005; Ong et al., 2011). Further, being one of few URM students in STEM and lacking access to role models of shared racial/ethnic backgrounds can lead to students feeling isolated and unsure about their ability to succeed (Griffin et al., 2015; Ong, 2005; Ong et al., 2011; Poirier, Tanenbaum, Storey, Kirshstein, & Rodriguez, 2009).

Though the above-mentioned studies do not use the framework of "ruling relations," we argue that the cultural expectations, norms, and organizational practices described operate as rules defining what makes someone a legitimate scientist. Using the concept of ruling relations in this study cued us to see how URM graduate students experience certain logics, norms, and assumptions that seem to exclude them as objectively right, impersonal, universal, taken for granted, not negotiable or malleable, and set up by individuals in the majority to maintain the privileges of those in the dominant group (Rakow & Nastasia, 2017; Smith, 1990a, 1990b).

Untangling socialization into STEM fields from ruling relations that exclude is complex. Separating the two requires stepping outside the space where such ruling relations were created; it requires a "third space." The concept of a third space can be understood in two ways. The first meaning emphasizes the characteristics and physical nature of third spaces. Sociologist Ray Oldenburg (1989, 1991, 2000) used the term third space to describe public, social spaces outside home (first space) and work (second space) where people gather, interact, and enjoy each other's company and conversation. Third spaces have regulars but welcome newcomers and have few prerequisites for participation. There is a tone of accessibility, even playfulness at times (Oldenburg, 1991; Putnam, 1995, 2000). Oldenburg noted third spaces also promote social equity by leveling the status of guests, and offering psychological support to individuals and communities. The second definition contextualizes what can happen in third spaces. Homi K. Bhabha (2004) theorized third spaces as places where colonized or oppressed groups imagine their liberation. The in-between space makes things previously invisible visible, unmasking

underlying assumptions in the first two spaces (Whitchurch, 2012). They are spaces where marginalized people can show their real selves, often engaging in transgressive acts that challenge the norms of logics in their first and second spaces (Bhabha, 2004; Hulme, Cracknell, & Owens, 2009; Whitchurch, 2008). Thus, minoritized groups can "initiate new signs of identity, and innovative sites of collaboration and contestation" (Bhabha, 2004, p. 1). New structures of authority and values can be created through discourse and professional interactions (Rutherford, 1990). Incorporating both meanings of third space allows us to conceptualize what third space is, as well as consider how it might operate to mitigate or transgress aspects of STEM disciplinary cultures that exclude students with marginalized identities.

This study focuses on the experiences of URM STEM graduate students who are most often the minority in their departments and fields whether by race and ethnicity. Several scholars have applied the concept of third spaces and its special role in supporting minoritized groups to educational environments. For example, scholars have studied the creation of third spaces to improve literacy learning in primary schools (Gutiérrez et al., 1999), middle school girls' science learning (Barton & Tan, 2009), English language learning for high school students from migrant families (Gutiérrez, 2008), and youth engagement in alternative education programs in high school (Plows, Bottrell, & Te Riele, 2016; Vadeboncoeur, 2009). Specific to higher education, Cantor (2011) detailed how third spaces helped women faculty in the sciences build social capital. Likewise, O'Meara and Stromquist (2015) found that interdisciplinary faculty peer networks served as third spaces, which were able to "emphasize the role of personal and professional relationships" to facilitate faculty retention and advancement (p. 354).

Although the described line of research has considered the utility of third spaces in facilitating positive academic experiences for K-16 students and faculty, this is one of the first studies to apply this concept to graduate education. In this study, we sought to understand the

ruling relations URM STEM graduate students perceive as shaping their experiences and how the PROMISE program, a semi-autonomous program (recognized by institutions but dependent on outside support) created to support URM STEM graduate students, operates as a third space.

Method

We used an ethnographic case study approach to understand (a) ruling relations experienced by URM graduate students in STEM fields and (b) how the PROMISE program functioned as a third space for participants, structuring social interactions that ran counter to ruling relations experienced inside academic departments and colleges. Our analysis focused on a bounded system or case (Jones, Torres, & Arminio, 2006; Yin, 2014): the PROMISE program. As is typical for case study, we were interested in understanding our case within its real-world context (Yin, 2014). That is, we were not interested in students' experiences in the PROMISE program in isolation but wanted to understand how participation in PROMISE impacted their experiences in their STEM graduate programs and vice versa. The PROMISE program strove to counter some of the conditions students experienced in their STEM graduate programs; thus, understanding those experiences was necessary to gaining insights into how PROMISE functioned as a space that was different from students' STEM departments and colleges.

Ethnographic case studies aim to understand a process and are especially appropriate to study the meaning of behavior, the language, and the interactions among members of an identifiable group of people (Creswell, 2007). Ethnographic case studies often reveal patterns observed from the outside of which participants may be unaware, though they ground their actions (Stenhouse, 1985). Researchers engage in extended observations of the group and look for patterns such as customary social behaviors, ideas, and beliefs expressed through language or material activities. The focus is on a clearly identifiable case with boundaries (in our case the

PROMISE program activities and community) and how a group works, as well as how issues of power, resistance, and dominance impact the group (Creswell, 2007).

Our approach was also shaped conceptually by traditions of institutional ethnography, which addresses how participants' social interactions are embedded with power. This approach studies everyday interactions to expose "ruling relations" or the organization of people into different kinds of experiences (Smith, 2005, p. 13). Elliott (2005) observed that the "researcher is responsible for providing an analysis of narratives which make explicit that which has gone without saying, and which makes linkages between particular cases and underlying social conditions" (p. 148). We sought to reveal what URM graduate students experienced as ruling relations; the intangible but pervasive organizing practices in departments and fields that discouraged their participation.

The Case

The National Science Foundation (NSF) created the AGEP program in 1999 to support the retention and advancement of URM graduate students in the STEM fields and enhance the preparation of URM students for faculty positions in academia (American Association for the Advancement of Science, 2015). There are currently 11 AGEP programs with 50 participating institutions, as well as 9 programs with 38 participating institutions that have continued beyond their NSF AGEP funding. PROMISE, Maryland's AGEP, is a system-wide effort led by the University of Maryland Baltimore County (UMBC). It began in Fall 2013, building upon earlier versions of PROMISE that was established in 2002 (PROMISE: Maryland's AGEP, 2015). The three main public research universities in the Maryland system organize activities open to all students system-wide that strive 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). To achieve these goals, PROMISE hosts a variety of events and

activities, including: (a) a semi-annual intensive dissertation writing workshop; (b) an annual student research symposium; (c) an annual coaching, mentoring, and networking conference; (d) professional development workshops; and (e) semi-annual community-building celebrations.

Participants

Participants in these events are graduate students attending University of Maryland System institutions. PROMISE uses the same broad definition for STEM as NSF, which includes: science, technology, engineering, and mathematics; social, behavioral, and economic sciences; and education and human resources. While PROMISE events are open to all students, the events are specifically marketed toward URM STEM graduate students. Some white women, who may feel isolated in male-dominated fields, also take advantage of PROMISE resources.

In qualitative research, the researchers are the main data collection instruments (Merriam, 1998), and their backgrounds may influence how a researcher approaches a study. The researchers on this project included two graduate faculty and two graduate students who have worked in academic departments, have studied STEM environments, and have a commitment to diversity and inclusion. One of the authors identifies as a faculty member of color, the other three identify as white. Our team also differed by gender, (1 male, 3 female), international status (3 U.S. citizens and one permanent resident), and STEM and non-STEM undergraduate majors. Our different identities, at times, allowed us to have an insider view, while at other times we observed meetings and events from an outsider perspective. Our multiple perspectives helped to counter-balance an inclination toward seeing the data from only one lens and provided a well-rounded and conceptually driven interpretation of findings.

Data Collection

After receiving IRB approval, we collected multiple forms of data over a three-year period (2013-2016). Observations were the primary method of data collection. We conducted 18

observations of PROMISE events (see Table 1). Corbin and Strauss (2008) noted that "observations put researchers right where the action is, in a place where they can see what is going on" (p. 29–30). During observations, we took both descriptive and reflective notes using an observation protocol (Creswell, 2007). Our semi-structured observation protocol included instruction to note (a) the physical setting and feel of the room, (b) direct quotes from students, presenters, and other participants, (c) observations of interaction patterns (e.g., who interacted with whom, where did interactions take place), (d) observations of nonverbal communication (e.g., nodding, smiling, laughing, shaking one's head), and (e) observations regarding the structure and implementation of the program events. The semi-structured observation protocol cued us to take notes on social interactions that suggested elements of third spaces and ruling relations from our literature review, but also provided space to note social interactions that seemed important but unrelated to these concepts (Merriam, 1998). Conducting observations at the same events multiple times allowed us to reach saturation in key themes (Jones et al., 2006).

Observations were carried out by the four authors, who attended program events as participant observers (Yin, 2014). A single author completed each observation and took notes. Two authors completed six observations, one author completed four, and one author completed two. There was no assignment of researchers to particular events—rather different authors observed the same event in different years. Transcribed notes from observations were reviewed by the entire research team. Program leaders made clear to participants in programs that they were part of NSF-funded programs that were being studied and the role of authors in this process. In no instance was data collection conducted in a deceptive manner, and we provide anonymity to program participants throughout this article.

In addition to observations, we collected program evaluation data, activity materials, blog posts by participants about the program, and reflections written by program leaders. We used this

material to prepare for the observations, so we understood the program objectives, names, and backgrounds of speakers and facilitators, and how program events had been described to participants. We also drew on this material during data analysis. A potential drawback of observations is that the observer will misinterpret comments. Therefore, observations are often best used alongside other data sources from the same participants (Corbin & Strauss, 2008).

Data Analysis

The coding process for the analysis of participant observations was both deductive (applying notions of third space and ruling relations drawn from the literature) and iterative. Consistent with norms of qualitative inquiry, we began by reading and rereading all of the participant observations. We then began coding by marking places where data corresponded with each research question (see Table 2). For example, we marked places where our observation notes indicated experiences that constrained participants' sense that they belonged in their department and could be successful there. In a second round of coding, we mapped constraints and challenges found against the ruling relations noted in our literature review. In a third round of coding, we focused on participants' experiences in PROMISE activities. We also looked for disconfirming data and emergent themes unrelated to our conceptual framework. As a final step, we engaged in "thematic memoing" on the research question topics (Rossman & Rallis, 2003).

Trustworthiness

We engaged in several techniques to establish credibility, transferability, and confirmability; hallmarks of trustworthiness in qualitative research (Lincoln & Guba, 1985). Our data collection included a variety in kinds of evidence (observations of program events; document analysis of evaluations, program materials, blogs by participants, and other texts written about or by participants related to the program) (Lincoln & Guba, 1985; Morrow, 2005). To ensure that we were accurately reflecting our participants' voices, we engaged in member

checking by presenting early findings to current participants and administrators and incorporating their responses to these findings into our study (Creswell, 2007; Lincoln & Guba, 1985; Merriam, 1998; Jones et al., 2006). For example, during one member checking debrief, an administrator noted details in the environment (e.g., orchestrated introductions, nametags, and messaging) that we later paid more attention to in subsequent observations. Likewise, a participant raised the importance of online discussion groups and blogs between or after major events as places for additional support, which was integrated into our findings. Furthermore, we provided thick description of events and experiences to assist in transferability to other contexts (Lincoln & Guba, 1985). Finally, our study involved what Lincoln and Guba (1985) called prolonged engagement, which allowed data to be gathered to the point of redundancy. We spent a significant amount of time intensely studying interactions to develop a thorough understanding of context and culture, which strengthened the interpretation of the data (Morrow, 2005).

A primary purpose of institutional ethnography is to reveal ruling relations with an eye toward changing those relations. This is consistent with Kvale's (1995) notion of pragmatic validity, where an important measure of the work is the degree to which it is useful for future change. As noted above, we cultivated pragmatic validity by presenting early, emerging, and final conclusions to the program's advisory board. Reflections were then incorporated back into the study and the results shared with the program to aid in its planning and assessment.

Findings

Graduate students experienced several kinds of ruling relations in their STEM departments, which hindered their participation and success. Our participants often presented these ruling relations in contrast to what they experienced in the PROMISE program. In this section, we first discuss the ruling relations participants experienced in their STEM departments: (a) isolation and lack of community, (b) individualism and competition, and (c) hierarchy. We

then discuss the different organizing conditions participants experienced in the PROMISE program: (a) community, (b) affirmation and support, and (c) egalitarianism.

Graduate Student Experiences of Ruling Relations

Graduate students shared three organizing conditions that shaped their experiences in departments and which they found discouraging. We describe these organizing conditions - isolation and lack of community, individualism and competition, and hierarchy - as ruling relations. Although students did not call these experiences "ruling relations" themselves, they described their experiences of them as structuring, coordinating, and overall shaping their everyday experiences in departments, which is consistent with Smith's (1999, 2005) definition.

Isolation and lack of community. Students described a pervasive lack of community and structured isolation. For example, students noted the structure of doctoral studies required a lot of time working on one's own - especially during the dissertation stage. A program alumna shared with current students at a PROMISE event, "I didn't realize how much time you spend alone [during the dissertation stage] ... All you have left to do is write." Similarly, during a roundtable conversation, one participant told peers that she struggled to find opportunities to connect with other graduate students. She said, "I mean, they have the grad pub and stuff like that on campus, but you really don't interact with too many people."

Many students of color noted they lacked a support network of individuals who understood their experiences. For example, one program alumna shared at a session, "In my program, it was just me and my friend. She was 50% of the minority and I was 50% of the minority. When she graduated, I was 100%." Similarly, a current student noted:

> [My experience] has been unique because I'm a minority grad student and in [sub-discipline of] Engineering. I can tell you that there are only three of us, and now, they're two that are even trying to get their PhD. It doesn't really add to the difficulty but just

> makes you feel kind of like a unicorn, because I'm really, really one of a few. In every class that I was in, I was the only black student there; every class - for graduate school that is.

This student seemed to feel as if a spotlight was on him as one of few students of color in his program, and not in a way that facilitated his success.

In addition to lacking access to peers of color, students also often lacked interactions with faculty who shared their identities. One student explained to mentors and student participants that he had a positive relationship with his advisor, but it was strictly professional and work-related. He said, "I'd like [the relationship] to be a bit more personal ... just learning more about how we are, how we came to be in situations that we want to be in, being able to speak on a more personal level makes asking certain questions easier down the road." The student further pointed out how different his relationship was with faculty of color who he met at a conference and who were able to relate to his experiences as a racial minority in STEM fields.

While URM students felt that white faculty could not understand and relate to their experiences, neither could many of their family members. A program alumna shared with current students how she had to protect her time from family. However, protecting her time in this way had a downside; eventually family stopped calling and she felt even more isolated. She said, "The phone calls stopped coming ... when people start to honor your time, you don't know how to reconnect." At the same event, another alumna talked about the tension between being a woman of color and a doctoral student. "You are privileged but still experiencing marginalization," she said. The alumna explained how this tension affected her relationships with her community back home. "When you go to grad school, you change .... Your family is going to recognize [the changes]," she said. She shared how this led to uncomfortable situations, arguments, a lack of understanding, and a feeling of isolation. Such experiences resulted in

PROMISE participants feeling like their graduate experience in the classroom as well as social reality outside disconnected them from peers, family, and colleagues of color. They felt very few or no structures, cultures, or rules in departments encouraged community or connection.

Individualism and competition. Graduate students also experienced environments that stressed individualism and competition in their STEM departments, colleges, and fields. Students felt that they were in competition with other students for attention from their advisors, access to equipment, and recognition by faculty and peers. In this competition, the focus was on students' outputs - grades, publications, awards, and the dissertation - and not their learning or the process.

Competition often appeared in students' relationships with their advisors. For example, at a PROMISE event, a student shared during a roundtable conversation he believed his advisor was not satisfied with his work, and because of that, he had less access to lab equipment than other students. He said, "I had to stay up at night because lab equipment wouldn't be available to me during the day, because, for some reason or reasons, during that time it would be allocated to the other students because my project wasn't a priority." The student added that, in response, he strove to produce more, pushing to publish more papers and win more awards than other students to gain his advisor's respect. Another student believed that her advisor had favorites, which created competition among her advisees. She said, "Advisors always have favorites; it's human nature. But it would be nice to not make that obvious . . . it creates conflict and unnecessary competition."

In this competitive climate, students were afraid to make mistakes or admit their struggles; they feared making a mistake or struggling signaled that they were not smart enough to succeed. For example, one program alumna shared her feelings after receiving a C in a class at an event. She said, "I was so embarrassed; I considered dropping out of the program." Another student noted that his advisor set up an environment where he feared making a mistake. He said,

"I was very afraid to make a mistake because I was being threatened in the sense that I was told that if you don't get this right and if you don't finish this in a certain amount of time you are gone. So I did not want to bring my mistakes to [faculty]." Several students shared how this focus on outputs and competition left them feeling like imposters, or not smart enough to succeed in their program. One participant said, "This imposter syndrome - it's a real thing."

Competition and individualism shaped how students understood they should behave in interacting with students and faculty. The logic of this ruling relation framed success as a zero-sum game. That is, students were socialized to assess who was favored in the department and defined as succeeding. When one student or research project was winning, it seemed others were not, as there was limited attention and spotlight to go around.

Hierarchy. Graduate students also described organizing practices that emphasized hierarchy and experienced hierarchical structures in their relationships with faculty and other graduate students. Success in the competition for attention, access to resources, and recognition determined one's position in the hierarchy. For example, one student shared with peers at a PROMISE event that students in her lab had different levels of power due to their perceived productivity and value to the professor. She explained that this structure "creates a hierarchy that is unproductive." This hierarchy influenced access to resources and, thus, impacted students' ability to succeed. She also said that the hierarchical structure discouraged collaboration; students were more interested in securing their status in the hierarchy than supporting their peers.

Other students described hierarchical structures in their relationships with faculty. One student shared that he felt micromanaged by his advisor. He said, "What I mean by micromanaged is, 'okay, every week tell me what it is that you've done in great detail so that I can critique you but not give you any positive or any real nice, any real feedback.'" The student wanted a different relationship with his advisor but did not feel that he was in a position to say

anything. Likewise, one participant shared how he felt powerless when his advisor hindered his progress with recurring negative feedback, when he felt he was working hard, publishing regularly, and even getting recognition for his work from outside the university. After three years, his advisor told him that funding had run out and would not be renewed; he was not willing to move forward with the student's research project. The student felt that he had been treated unfairly but did not think he had any power to change the situation. The student switched advisors, but his problems did not end. According to our participant, his former advisor shared negative reviews of his work with his new advisor, a younger professor with a lower-ranked position. The new advisor placed him on probation and told him he needed to prove the value of his work. Our PROMISE student believed that his new advisor was not willing to question the older professor because of her lower rank. Thus, the student both experienced hierarchy personally and observed how it shaped department norms and power relations between faculty.

Similarly, prior to a PROMISE event, a participant shared his frustration with the hierarchical structures in his departments in casual conversation with peers as he recounted a friend's difficulties with his advisor. The participant appeared to be very angry for his friend, but felt helpless. He said, "It's not like you can really complain about it because [friend's advisor] was one of the preeminent minds in [field of study] and was just basically like one, I think maybe, the second or third most powerful professor in the department. He brought in a lot of money, so it's not like he's going anywhere unless he chooses." The participant felt that the professor had significant power in a hierarchical relationship with his students and within the department and his field. The ruling relation of hierarchy was seen as pervasive, structuring professional interactions across the academic community.

Graduate Student Experiences in the PROMISE Program

Through our observations, we found that PROMISE events and activities were set up to foster community, provide students with affirmation, and emphasize egalitarianism. These three organizing practices stood in contrast to, and/or were experienced against the backdrop of ruling relations in STEM departments, which often emphasized isolation and lack of community, individualism and competition, and hierarchy.

Community. The PROMISE program strove to develop a sense of community among students, faculty, and mentors - particularly for URMs. We observed how this community was formed through the development and structure of PROMISE events, as well as resulting social interactions. For example, at the 2016 Research Symposium, two students sitting at the same table were trying to figure out how they knew each other. As the conversation went on, they remembered attending the same PROMISE events and more things about each other. They started catching up on what was going on with their families and how they were progressing in their programs. The two students included other participants at the table in the conversation, asking them about their families, degree programs, and career plans. Such conversations were typical for PROMISE events. We observed that the set-up of almost all of the events - with the exception of some professional development workshops - encouraged these types of interactions. Participants sat at small roundtables and were given time during the formal program to introduce themselves to everyone at their table and get to know each other.

Many PROMISE events such as the Summer Success Institute, Research Symposium, Dissertation House, and the Fall Harvest Dinner, also included connections over food and drink, often served while participants were sitting around the small round tables, which allowed for informal connections and networking. For example, on the last day of a Dissertation House, students celebrated completing the workshop by eating ice cream as they shared their successes and struggles of writing. The atmosphere was relaxed and there was a lot of laughter and jokes.

Dissertation Houses – four- to five-day workshops that provided dissertating students with tools, one-on-one meetings with faculty serving as dissertation coaches, and uninterrupted writing time - were specifically structured to create a support group for students. At the Winter, 2016 Dissertation House, the Director of Graduate Studies shared her hopes for creating a supportive cohort for students with participants. She acknowledged that family and other support people, while important, may not understand the students' experiences; however, she reminded, "This is a group that understands what you're going through and that's really important to have." Participants, therefore, started their Dissertation House experience with the expectation of developing a peer community. The structure of Dissertation House - having lunches together, sharing personal goals and accomplishments at the beginning of each day, and having an intensive writing experience together - further contributed to creating community.

Digital platforms were also used to build community. Participants were required to blog every day about their accomplishments and struggles on the Dissertation House website. Once the program concluded, participants were encouraged to continue blogging to keep the community going beyond the time spent physically together. A Dissertation House alumna shared with current students at a session during the Summer Success Institute that a small group of her peers continued to blog every day to update each other on their progress. "It was an amazing process," she said. "It felt like we were seeing each other." Some students started spending time together that was not related to their studies, meeting up for dinners or working out together. "[The blog] was the thread that kept us connected," the alumna explained.

PROMISE events not only built community among students; they included intentional efforts to connect students and faculty. For example, at the Summer Success Institutes students were seated at tables with at least one or two faculty members or mentors. This allowed for structured discussions with faculty and mentors during sessions, as well as informal

conversations before and after sessions. Some of the events, such as the Fall Harvest Dinner, had primarily social purposes. Tables were labeled with the names of different disciplines to allow students from all participating campuses to meet peers and faculty from their areas of study. The formal program was kept short to allow for informal conversations. At the 2016 Fall Harvest Dinner, program facilitators added more structure to the networking aspects of the event to help participants make new connections. After dinner, all participants - students, faculty, staff, and students' guests - were asked to count off by numbers and based on those numbers join a new table. After relocating, individuals were asked to introduce themselves and share get-to-know-you information. Participants appeared engaged and at ease. Many smiled and laughed.

One of the Co-PIs of the PROMISE program also played a central role in creating a sense of community. The Co-PI was a central figure in the program, well-known by participants from all institutions, and instrumental in shaping the atmosphere at events. She took the time to get to know students individually and learn about their successes and struggles. One student shared how she first met the Co-PI when she was doing a presentation at her undergraduate institution. The presentation and the Co-PI's care for students stuck with this participant. When she started graduate school and heard that this Co-PI was leading the PROMISE program, the student immediately decided to participate. She said "So when I heard her name, I always participate in anything that they had." At many events, we observed the Co-PI standing near the entrance, greeting old and new participants, hugging many, and welcoming them.

PROMISE events also created a sense of community by including students' families and welcoming them into programming spaces, specifically at the Summer Success Institutes and the Fall Harvest Dinners. At the Summer Success Institute in 2015, one female student brought her husband and 7-month old child; a parent accompanied another student. At the Summer Success Institute in 2016, one of the Co-PIs of the program explained that family was invited to the

events to help them understand what graduate students go through. The keynote speaker that year talked about how family matters. He asked his wife and children, who were in the audience, to get up and be recognized and shared how his wife had supported him through the Ph.D. journey. The keynote speaker then encouraged PROMISE participants to have conversations with their family members about the type of support they need to be successful.

Affirmation and support. In addition to developing a sense of community, the PROMISE program was organized to provide students with affirmation and support. While this organizing practice was visible at most PROMISE events, it was particularly noticeable at the Dissertation Houses. One year, Winter Dissertation House had to take place online via blogs due to snow. The facilitator e-mailed the students with encouragement along with advice and guidance on what to do next:

> See even a snowy day couldn't keep you away. When you are serious about your dissertation a snowy day is just another opportunity to get some work done!!! Take the opportunity to reread your proposal from start to finish and make notes in the margins. Download the dissertation Template from the Grad school's website as well. Drag and drop (cut and paste) parts of your proposal into the appropriate sections of the template and then print out.
>
> Tackle one section at a time. That's my suggestion for today. Afterward you can and should tackle some items from the list you have above. Look at other researchers' interview questions as well because their questions have already been validated.

The facilitator provided general affirmation and encouragement by acknowledging how students were continuing to work in spite of the snow days. The facilitator also provided concrete advice and "how-to's", such as the comment about taking notes in the margins of dissertation proposals

or recommendations about using the grad school's dissertation template. Such concrete advice was offered to help students who felt stuck and were unsure of what to do next.

PROMISE leaders also encouraged students to talk honestly about their experiences and share their concerns. Students appreciated being able to share their struggles and find out that they were not the only ones facing certain challenges. For example, a presenter at a PROMISE event shared that she feared she was not smart enough to be in graduate school and thought that she was the only one having these doubts. She said, it would have helped her if someone in her department had said, "Other people are experiencing this imposter syndrome ... it's a real thing." She shared that at PROMISE events she was able to find support where others acknowledged having the same fears and doubts. Knowing that she was not the only one and that feeling this way was normal helped her overcome her fears. Similarly, at Dissertation House a student shared that she struggled with writing because she did not know how to start and felt her writing was not that good. The facilitator noted that many people face the same challenge and shared tips on how to get started. She ended with, "If you are a perfectionist, please let it go ... give yourself permission to write the ugly draft and then later decide whether or not you want to show it to someone. Sometimes we are better editors than we are writers." The presenter acknowledged students' feelings as normal, then provided support for how to overcome their struggles and gave students permission to not be "perfect."

In the PROMISE community, students were also often told that they had what it took to make it through the Ph.D. Instead of being critiqued and questioned, they were told that they could be successful. For example, at Dissertation House one speaker shared with students:

> Every single one of you have been admitted to graduate school. If we made a mistake, that's on us, our bad. I need you to get your swagger back. Remember when you thought

> you were all that...and applied to graduate school. ...The same confidence that you had to apply to graduate school, you need it to finish your dissertation.

The facilitator then explained how one's confidence can get hurt in graduate school and encouraged students to "remember who you are. Re-read your statement of purpose."

We observed facilitators at PROMISE events address not only students' academic needs but also focus on the whole person and bridge the gap between students' academic and personal lives. For example, many PROMISE events included a variety of topics, some geared toward academic or career development, and others addressing work-life balance and financial planning for the future. At several events, facilitators emphasized the need to focus on one's health. At the 2016 Summer Dissertation House, the facilitator reinforced this message by providing healthy meal options for lunch and snacks, inviting a speaker from the Counseling Center to talk about mental and physical health, and offering an introduction to yoga session as part of the event.

Even feedback and critique were set up by facilitators to be in support of student success. For example, at the Research Symposium, when one of the PROMISE coordinators welcomed the group at the beginning of the day, he emphasized that the goals of the program are to give students a platform to present their research, to get feedback, and build on their presentation skills, as well as network with each other. Feedback was given in front of and geared toward the whole group, focusing on what students had done well, allowing all attendees to learn from the experience. The competition and prizes were not mentioned during the introduction, but then brought up as part of a quick reminder asking presenters to stay until the end. Throughout the day, organizers stressed community, reminding participants how important it was for everyone to support each other on this journey toward the Ph.D.

Egalitarianism. The PROMISE program created a sense of egalitarianism among students, faculty, and mentors. Whether it was social events like the Fall Harvest Dinner or more

academically focused events like Dissertation House and the Summer Success Institute, faculty and mentors made relational comments, emphasized similar experiences, and made clear, overt attempts to connect with students personally. For example, at Dissertation House, a presenter started her welcoming remarks by explaining how many of the techniques and skills taught at Dissertation House are the same that faculty need to succeed. She said,

> I hope that you take seriously this process, because this process will help you for the rest of your life.... You can think about the whole PhD as a process; it's the process of learning to do structured research.... It doesn't really matter what your dissertation is on. It's just proving that you learned the process and can demonstrate it to a committee of people. Think about the fact that it is a process; you are demonstrating the process; and you have the rest of your life to do this ground-breaking work.

By comparing the students' work to her own and other faculty's work, the director broke down the hierarchical differences between faculty and students and showed they were all doing similar work and facing similar struggles. The director then admitted that she had not learned all the lessons from Dissertation House yet. A few weeks prior she started working on a paper with colleagues. Her colleagues had been sending e-mails back and forth, but she had not done her part yet. Finally, one of her collaborators e-mailed her noting that they really needed her part, so that is what she did the weekend before Dissertation House. The director's story drew laughter from the audience. It made her seem real and like a relatable and accessible person.

PROMISE events seemed intentionally structured to create this sense of egalitarianism. The facilitators and presenters at many events sat at small roundtables with students rather than lecturing from a podium and being disconnected to the audience. Speakers and facilitators engaged their audience, asked questions, and encouraged participation. For example, during Financial Advising sessions at the Summer Success Institute, facilitators led discussions at small

roundtables. One of the speakers talked about loans from banks versus credit unions. He started by asking participants to share their experiences and thoughts, acknowledging that participants also had knowledge and that he was not the sole expert. Similarly, during another session at the Summer Success Institute, participants were asked to brainstorm solutions to specific challenges students may face in graduate school. Rather than presenting students with the solution, students' knowledge and ability to problem-solve was highlighted. Mentors guided but did not dominate the conversation. They let students take the lead and share their thoughts. This way, the discussion became a true brainstorming session rather than faculty sharing their expertise.

At some PROMISE events, faculty and staff also participated in activities along with students. Examples include the Fall Harvest networking activity described earlier and the Sisters in the Dissertation House session, where faculty, staff and students all listened to experiences of Dissertation House alumni and participated in conversations. Because formal introductions did not happen until the end of the session, many students did not realize that faculty and staff were among the participants until the very end. This sense of equal footing allowed students to feel comfortable around faculty and staff, share their experiences, and network. Moreover, a Sisters of the Dissertation House presenter commented on how "there was no competition" at PROMISE events, something that was a new experience for her coming from a department where she experienced competition as a major aspect of day-to-day life.

In addition, the majority of PROMISE events were free, including Summer Success Institutes, professional development workshops, the Research Symposia, Harvest Dinners, and several of the dissertation houses. If participants were charged a cost these fees were small (e.g., $40 for a 5-day dissertation house in summer 2016), and typically covered meals. In addition, PROMISE events were highly accessible as they were either hosted on students' home campuses or transportation was provided. For example, each year the University of Maryland Baltimore

County has buses taking participants from their campus to the College Park campus for Harvest Dinner. The organization of PROMISE events, easy accessibility, and tendency not to privilege some students over others or faculty ideas over student ideas, fostered an equalitarian ethos that students found different and empowering.

Discussion and Implications

Despite the rigor of our research design – conducting observations at 18 PROMISE events over several years, observing six different types of events with participants ranging from 14 to 175 members – our study has some limitations. First, because it is not practice of the PROMISE program to collect demographic data of registered participants, and there is a culture of welcoming those who do not RSVP to drop in, we cannot report participants' demographic information. Consistent with the goals of PROMISE to recruit, retain, and advance URM graduate students in STEM, we observed that a majority of participants seemed to be URM students, and many participants shared they were in STEM Fields. However, there were also white women and men and students from other disciplines who attended some events. We recognize the inability to report demographics of PROMISE participants as a limitation.

In addition, because we analyzed the comments of those who spoke at events, interactions between participants, and resonance and response to comments, we may not have captured the thoughts and experiences of more passive participants. Nor was our analysis able to dig into whether students from some disciplines felt some ruling relations more acutely than others. Although we drew on additional sources, such as program evaluations and writing by students who provided their experiences in a way they might not have verbally in meetings, we recognize the potential limitation of favoring the more vocal actors.

In spite of these limitations, our study provides a unique and important way to understand how inequality is integrated into the graduate socialization process. URM graduate students'

narratives suggest they experienced norms, assumptions, logics, and organization (e.g., ruling relations) within primary spaces while learning the knowledge, skills, and habits of mind required to become scientists. These ruling relations led students to question their capacity for success and belonging in science. The specific kinds of ruling relations reported in our study are consistent with previous literature on the challenges faced by URM graduate students in STEM departments. For example, similar to extant literature (e.g., Griffin et al., 2015; Ong, 2005; Ong et al., 2011; Poirier et al., 2009), participants experienced isolation and had limited access to mentors, and particularly mentors of color. Moreover, students experienced competition, critique, and hierarchical structures in STEM departments in classrooms, laboratories, and every-day interactions with faculty and peers (Davis & Finelli, 2007; Fuhrmann et al., 2011; Gibbs & Griffin, 2013; Hurtado et al., 2011; Mason et al., 2009; Museus et al., 2011).

Three characteristics of how students experienced these aspects of their STEM departments led us to describe them as ruling relations. First, students experienced these aspects of their program as taken for granted rules or processes (Smith, 1999, 2005). For example, students were constantly aware of where they stood in their departmental hierarchy, and it was usually at the bottom. They assumed their access to resources such as faculty time, lab equipment, professional networks, and funding would all be based on their place in the hierarchy, so they needed to move up in the department hierarchy or would not succeed. Second, ruling relations are set up by and maintain the privilege of the dominant group (Smith, 1999, 2005). Students understood that these norms and ways of being were set up by those in charge of their program—in this case their faculty, department chair, and dean. Because few of these individuals looked like them, URM graduate students questioned whether these individuals could relate to their experiences and understand the challenges they were facing. This in turn may have led URM students to question whether the systems were set up in a way that allowed individuals

like them to make it in the STEM fields. Moreover, students described their interactions with those in charge as shaped by a pressure to perform and prove their ability to succeed, even when the norms and ways of being were set up in a way that provided students with little support and encouragement. Students, thus, may have questioned whether the individuals in charge cared if URM students made it; it might even reinforce their position if URM students did not. Third, graduate students did not experience ruling relations as negotiable or malleable (Smith, 1999, 2005). For example, the department's way of allotting lab time and sharing equipment facilitated a competitive, individualistic learning environment. However, as far as students knew, this had always been how lab time was allotted and a competitive, individualistic environment was a norm in the STEM fields. Thus, to become a scientist, graduate students needed to adapt or otherwise find ways to survive because they did not see ways to change existing processes.

Organizational identification theory suggests that individuals make sense of their social environment by classifying others into groups and then identifying with the groups they perceive to be most like themselves (Jones & Volpe, 2011). This results in in-groups and out-groups. It is reasonable to interpret URM STEM students' experiences of the ruling relations we have described as making them feel like they were part of the out-group, marginalized and excluded. The fact that they experienced these norms as fixed, not in their control, and created by a group that did not identify with them and to which they did not fully belong, constrained students' sense that they could be successful in their academic programs.

Consistent with prior research, our participants also felt the norms and logics of their STEM disciplines provided little room for them to express other dimensions of their identities beyond scientist (Carlone & Johnson, 2007; Griffin et al., 2015; Ong, 2005; Ong et al., 2011). Such norms can be especially harmful to URM students, given that many place significant value on connections with family and friends outside of the academy, and embrace aspects of their

identities beyond scientist as important for their success (Griffin et al., 2015; Ong, 2005; Ong et al., 2011; Poirier et al., 2009). Although white graduate students receive similar signals and socialization related to not displaying dimensions of their identities beyond scientist, they were also in the majority, at least by race and ethnicity, and often had access to peers, role models, and mentors of shared racial or ethnic background. Being in the majority normalized white graduate student identities as belonging in the academy. Whereas, consistent with prior work, being the only URM graduate student or one of only a few in a department made PROMISE participants feel as if there were more questions about whether they would succeed and be successful, which created additional need for support and reinforcement from peers outside their programs (Griffin et al., 2015; Ong, 2005; Ong et al., 2011; Poirier et al., 2009).

Alternatively, the PROMISE program operated as a third space, countering many of the ruling relations students experienced in their departments and disciplines. PROMISE events operated with many, if not all of the characteristics of third spaces noted earlier. It was neutral ground, voluntarily joined, where conversation was the main activity, and there was little pretentiousness (Oldenburg, 1991; Putnam, 1995, 2000). There were few formal requirements for entry, students were very intentionally welcomed in when they attended, and hierarchy was de-emphasized. Participants often laughed over meals and there was a sense of warmth and belonging. Beyond PROMISE's physical construction as a third space, the program was also crafted as a space of liberation, helping URM STEM graduate students navigate their careers and lives in first and second spaces. This was primarily done by fostering professional interactions, structures of authority, and values within PROMISE events that disrupted and/or rejected the ruling relations participants experienced in their departments and disciplines. For example, PROMISE organized events and social interactions that fostered community and connection.

Participants were encouraged to get to know each other and stay in touch between events such that they would have a "shared history" (Bhahba, 2004).

PROMISE events created opportunities to develop relationships between students, and between faculty and students where multiple aspects of their identities could be shared. Affect based relationships, like those observed between students, have been shown to promote retention (Scott, Tams, Schippers, & Lee, 2015; Scott, Zagenczyk, Schippers, Purvis, & Cruz, 2014). Such relationships are most likely to form between individuals who are similar in some fundamental way (Jehn & Shah, 1997). Thus, the very organization of PROMISE activities as places for URM graduate students in STEM fields means (a) they will not be the "only one" and (b) they are among a group of other scientists—lessening the sense that they are outsiders in science.

Bhabha (2004) notes that an important characteristic of a third space is that it can "initiate new signs of identity" (p. 1). Critical mass, diverse role models, and welcoming of flexible identities made students feel supported. By creating a space where multiple aspects of identity were welcomed, this third space contested the idea that scientists have to compartmentalize identities when at work. Rather there was an assumed "normal" within the PROMISE activities of scholars and students as scientists and family members and friends. Moreover, in sessions successful URM scientists shared multiple parts of their identity, reinforcing the idea that such exposure of multiple identities was possible in successful scientific careers.

Third spaces often create new models of collaboration (Bhabha, 2004) and new structures of authority and values through discourse and professional interactions (Rutherford, 1990). At PROMISE events, faculty, staff, and alumni played different kinds of roles than the ones they typically played in STEM departments and fields. For example, PROMISE events encouraged egalitarianism in program interactions. Students, faculty, and presenters revealed themselves as vulnerable and used humor to make students feel they were not the only ones who struggled.

Program leaders affirmed graduate students, encouraged them to be confident, and told them that they wanted them to succeed. When presenters and mentors said that they understood what PROMISE students were going through they said this from a sort of middle place. They were colleagues from other STEM programs, so in a way they were from students' world of work—but a step to the side, by not being department and in many cases even institutional colleagues. Similarly, when presenters and mentors said they understood a lack of understanding from family—they did not say this as a family member of the student, but from one step to the side as an URM academic who has similar experiences with family and community. These side steps helped form a third space where presenters and mentors could resonate with graduate students' experiences without being direct members of their immediate work or home communities. In doing so, presenters and mentors also demonstrated significant emotional and social competencies that are important to graduate student agency (O'Meara, Knudsen, & Jones, 2013).

There were many other ways in which the PROMISE program operated consistent with prior research on third spaces. For example, many studies have shown third spaces tend to be places where navigational skills are enhanced (Barton & Tan, 2009; Cantor, 2011; Gutiérrez et al., 1999; Moje et al., 2001; O'Meara & Stromquist, 2015; Sturm, 2006) and much of the content shared in PROMISE meetings was on navigating departments and disciplinary cultures and structures. Scholars observe that interactions in third spaces are in fact political and can be places where underlying assumptions can be unmasked and turned on their head (Whitchurch, 2012). For example, we shared a situation where a PROMISE Co-PI helped a graduate student navigate financial troubles by talking it through and then connecting him to relevant resources. By affirming that this was an issue a student should raise – something the student had been unsure about – and providing assistance, the PROMISE Co-PI is, one could argue, redefining the role of faculty and/or contesting the idea that a student has to figure this out on his own (Bhahba, 2004).

Furthermore, our participants' third space experiences were not limited to in-person meetings, as many described affirming interactions by blogging and on listservs after and in between in-person meetings. Many third spaces in higher education have likewise been created with in-person and online components (Barton & Tan, 2009; Cantor, 2011; Gutiérrez et al., 1999; Moje et al., 2001; O'Meara & Stromquist, 2015; Sturm, 2006).

Our findings suggest multiple areas for future research. In particular, both the concepts of ruling relations and of third spaces are rich models for future study of graduate education reform. Many scientists have voiced concerns about the hyper competitive, individualistic, and homogeneous aspects of their STEM disciplines (McDowell et al., 2014). Yet they continue to exist. More could be done to name specific ruling relations in everyday interactions and how they shape URM students' decision to leave graduate programs or not become faculty. Future research might explore how much graduate students understand such ruling relations as fixed or malleable and the degree to which ruling relations shape graduate students' interests and career plans in science. In addition, some STEM fields had more success than others in diversifying over the last 20 years (e.g., Biology versus Physics). Future research might compare and contrast ruling relations across STEM fields and their effect on retention. Likewise, future research might apply the third space concept to explore the broader array of change-oriented graduate reform programs such as other NSF graduate education reform programs (i.e., the Center for the Integration of Research, Teaching, and Learning (CIRTL), the Integrative Graduate Education and Research Traineeship (IGERT), and NSF's Research Traineeship (NRT)) which attempt to create conditions wherein interdisciplinary, as opposed to pure disciplinary, thinking flourishes.

In terms of implications for practice, it is tempting to look at the third space, the PROMISE program, as a model to be used to reform all graduate education. Indeed, our findings have implications for reform of graduate education more generally and in STEM specifically,

especially as it relates to better retention of URM students. For example, our findings underline previous research showing the need for more culturally competent mentoring (McGee, Saran, & Krulwich, 2012; Thomas, Willis, & Davis, 2007), and advisor-advisee display of emotional and social competencies (O'Meara et al., 2013). However, closer inspection shows that some organizational and cultural advantages of third spaces are not easily transplanted to traditional graduate programs. For example, departments and their faculty have a strong evaluative role (Ebel, 1980). They assess the academic quality of candidates from admissions through dissertation defense. Therefore, part of the graduate student experience of competition, absent in the PROMISE program, is a role that departments play by necessity. PROMISE is structured as a support system, not a place of vetting or quality control. Although PROMISE creates strong systems of supportive feedback and coaching to improve academic excellence, this is still not an evaluative role. Thus, there are some ways in which programs like PROMISE are advantaged by existing outside, rather than being integrated into existing department organization.

Specifically, our findings suggest two considerations for reform of graduate education, which are relevant particularly for department chairs, faculty advisors, graduate directors, and associate deans. First, departments must better serve both the evaluative and supportive role, and not have them compete with each other. Evaluative spaces can also be supportive spaces (Haley, Jaeger, & Levin, 2014; McDowell et al., 2014; O'Meara et al., 2014). Second, we need to provide mentoring and structured interactions between faculty and students that show that not all organizational norms, logics, and forms are fixed but evolve over time and that it may be possible to influence the way a lab director organizes resources through feedback and pervasive arguments. In addition, mentoring and structured interactions with faculty and students need to reinforce the idea that being more community oriented and less individualistic does not have to

mean someone will not succeed in science. There are many ways URM scientists, as well as majority scientists, have created highly collaborative research teams and supportive lab groups.

In conclusion, the concepts of ruling relations and third spaces help us see the everyday department experiences of STEM URM graduate students and the programs created to support their retention in a unique light. We can use these lenses to understand not only what currently is, but to see the possibility of what could be, and create more inclusive academic environments for all STEM graduate students.

References

American Association for the Advancement of Science. (2015). Home. In *AGEP: Alliances for Graduate Education and the Professoriate*. Retrieved from http://www.nsfagep.org/

Barton, A. C., & Tan, E. (2009). Funds of knowledge and discourses and hybrid space. *Journal of Research in Science Teaching*, *46*(1), 50–73.

Bhabha, H. (2004). *The location of culture.* London, UK: Routledge.

Cantor, N. (2011). Gender equity in the sciences: Forging a 'third space'. *Office of the Chancellor, Paper 42.* Syracuse, NY: Syracuse University. Retrieved from http://surface.syr.edu/cgi/viewcontent.cgi?article=1044&context=chancellor

Carlone, H. B., & Johnson, A. (2007). Understanding the science experiences of successful women of color: Science identity as an analytic lens. *Journal of Research in Science Teaching*, *44*(8), 1187-1218.

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage.

Council of Graduate Schools (2016). *Minority attrition and completion in STEM doctoral programs.* Washington, DC: Author.

Creswell, J. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Davis, C. S. G., & Finelli, C. J. (2007). Diversity and retention in engineering. *New Directions for Teaching and Learning*, *2007*(111), 63–71.

Ebel, R. L. (1980). Evaluation of students: implications for effective teaching. *Educational Evaluation and Policy Analysis*, *2*(1), 47-51.

Elliott, J. (2005). *Using narrative in social research: Qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.

Fuhrmann, C. N., Halme, D. G., O'Sullivan, P. S., & Lindstaedt, B. (2011). Improving graduate education to support a branching career pipeline: Recommendations based on a survey of doctoral students in the basic biomedical sciences. *CBE-Life Sciences Education*, *10*(3), 239-249.

Gardner, S. K. (2008). Fitting the mold of graduate school: A qualitative study of socialization in doctoral education. *Innovative Higher Education*, *33*(2), 125–138.

Gibbs, K. D., & Griffin, K. A. (2013). What do I want to be with my PhD? The roles of personal values and structural dynamics in shaping the career interests of recent biomedical science PhD graduates. *CBE-Life Sciences Education*, *12*(4), 711-723.

Gibbs Jr, K. D., McGready, J., Bennett, J. C., & Griffin, K. (2014). Biomedical science Ph. D. career interest patterns by race/ethnicity and gender. *PLOS One, 9*(12), e114736.

González, J. C. (2006). Academic socialization experiences of Latina doctoral students: A qualitative understanding of support systems that aid and challenges that hinder the process. *Journal of Hispanic Higher Education, 5*(4), 347-365.

Griffin, K., Gibbs Jr, K. D., Bennett, J., Staples, C., & Robinson, T. (2015). "Respect me for my science": A Bourdieuian analysis of women scientists' interactions with faculty and socialization into science. *Journal of Women and Minorities in Science and Engineering*, *21*(2), 159-179.

Gutiérrez, K. D. (2008). Developing a sociocritical literacy in the third space. *Reading Research Quarterly*, *43*(2), 148–164.

Gutiérrez, K. D., Baquedano-Lopez, P., & Tejada, C. (1999). Rethinking diversity: Hybridity and hybrid language practices in the third space. *Mind, Culture, and Activity, 6*(4), 286–303.

Gutiérrez y Muhs, G., Niemann, Y. F., González, C. G., & Harris, A. P. (Eds.). (2012). *Presumed incompetent: The intersections of race and class for women in academia.* Boulder, CO: University Press of Colorado.

Haley, K. J., Jaeger, A. J., & Levin, J. S. (2014). The influence of cultural social identity on graduate student career choice. *Journal of College Student Development*, *55*(2), 101–119.

Hulme, R., Cracknell, D., Owens, A. (2009). Learning in third spaces: Developing trans-professional understanding through practitioner enquiry. *Educational Action Research, 17*(4), 537-550.

Hurtado, S., Eagan, M. K., Tran, M. C., Newman, C. B., Chang, M. J., & Velasco, P. (2011). "We do science here": Underrepresented students' interactions with faculty in different college contexts. *Journal of Social Issues*, *67*(3), 553–579.

Institute for Broadening Participation. (2014). Maryland PROMISE: University system of Maryland (USM)-wide AGEP-T. In *IBP: Pathways to Science: Science, Technology, Engineering, and Mathematics.* Retrieved from http://www.pathwaystoscience.org/programhub.aspx?sort=AGE-MarylandPROMISE

Jaeger, A. J., Haley, K. J., Ampaw, F., & Levin, J. S. (2013). Understanding the career choice for underrepresented minority doctoral students in science and engineering. *Journal of Women and Minorities in Science and Engineering, 19*(1), 1-16.

Jehn, K. A., & Shah, P. P. (1997). Interpersonal relationships and task performance: An examination of mediating processes in friendship and acquaintance groups. *Journal of Personality and Social Psychology, 72*, 775-790.

Johnson, A. C. (2007). Unintended consequences: How science professors discourage women of color. *Science Education, 91*(5), 805–821.

Jones, S. R., Torres, V., & Arminio, J. (2006). *Negotiating the complexities of qualitative research in higher education: Fundamental elements and issues*. New York, NY: Routledge.

Jones, C., & Volpe, E. H. (2011). Organizational identification: Extending our understanding of social identities through social networks. *Journal of Organizational Behavior, 32*, 413-434.

Kvale, S. (1995). The social construction of validity. *Qualitative Inquiry*, *1*(1), 19–40.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry* (Vol. 75). Newbury Park, CA: Sage.

Mason, M. A., Goulden, M., & Frasch, K. (2009). Why graduate students reject the fast track. *Academe*, *95*(1), 11-16.

McDowell, G. S., Gunsalus, K. T., MacKellar, D. C., Mazzilli, S. A., Pai, V. P., Goodwin, P. R., & Erb, M. L. (2014). Shaping the future of research: a perspective from junior scientists. *F1000Research*, *3*, 291.

McGee Jr, R., Saran, S., & Krulwich, T. A. (2012). Diversity in the biomedical research workforce: developing talent. *Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine*, *79*(3), 397-411.

Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco, CA: Jossey-Bass.

Moje, E. B., Ciechanowski, K. M., Kramer, K., Ellis, L., Carrillo, R., & Collazo, T. (2004). Working toward third space in content area literacy: An examination of everyday funds of knowledge and discourse. *Reading Research Quarterly*, *39*(1), 38–70.

Moje, E. B., Collazo, T., Carrillo, R., & Marx, R. W. (2001). "Maestro, what is 'quality'?": Language, literacy, and discourse in project-based science. *Journal of Research in Science Teaching, 38*(4), 469-498.

Morrow, S. L. (2005). Quality and trustworthiness in qualitative research in counseling psychology. *Journal of Counseling Psychology, 52*(2), 250-260.

Museus, S. D., Palmer, R. T., Davis, R. J., & Maramba, D. C. (2011). Special Issue: Racial and Ethnic Minority Students' Success in STEM Education. *ASHE Higher Education Report*, *36*(6), 1–140.

O'Meara, K., Jaeger, A., Eliason, J., Grantham, A., Cowdery, K., Mitchall, A, & Zhang, K. (2014). By design: How departments influence graduate student agency in career advancement. *International Journal of Doctoral Studies, 9*, 155-179.

O'Meara, K., Knudsen, K., & Jones, J. (2013). The role of emotional competencies in faculty-doctoral student relationships. *The Review of Higher Education*, *36*(3), 315-347.

O'Meara, K., & Stromquist, N. P. (2015). Faculty peer networks: role and relevance in advancing agency and gender equity. *Gender and Education*, *27*(3), 338–358.

Oldenburg, R. (1989). *The great good place: Cafés, coffee shops, community centers, beauty parlors, general stores, bars, hangouts, and how they get you through the day*. New York, NY: Paragon House Publishers.

Oldenburg, R. (1991). *The great good place.* Berkeley, CA: University of California Press.

Oldenburg, R. (2000). *Celebrating the third place: Inspiring stories about the "great goodplaces" at the heart of our communities.* New York, NY: Marlowe & Company.

Ong, M. (2005). Body projects of young women of color in physics: Intersections of gender, race, and science. *Social Problems*, *52*(4), 593-617.

Ong, M., Wright, C., Espinosa, L., & Orfield, G. (2011). Inside the double bind: A synthesis of empirical research on undergraduate and graduate women of color in science, technology, engineering, and mathematics. *Harvard Educational Review*, *81*(2), 172-209.

Plows, V., Bottrell, D., & Te Riele, K. (2016). Valued outcomes in the counter-spaces of alternative education programs: success but on whose scale?. *Geographical Research*.

Poirier, J. M., Tanenbaum, C., Storey, C., Kirshstein, R., & Rodriguez, C. (2009). The road to the STEM professoriate for underrepresented minorities: A review of the literature. *Report to the National Science Foundation, Alliances for Graduate Education and the Professoriate.* Retrieved from http://www. air. org/files/AGEP_Lit_Review_10–26–09. pdf.

PROMISE: Maryland's AGEP. (2015). About PROMISE: The AGEP for Maryland. Retrieved from https://PROMISEagep.wordpress.com/about/about-PROMISE-the-agep-for-maryland/

Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy*, *6*(1), 65–78.

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. New York, NY: Simon and Schuster.

Rakow, L. F., & Nastasia, D. I. (2017, Sept. 11). Relations of ruling: Using Dorothy E. Smith's concept for public relations theorizing. Paper presented at the annual meeting of the *International Communication Association* in Chicago, IL.

Rankin, S., & Reason, R. (2008). Transformational Tapestry Model: A comprehensive approach to transforming campus climate. *Journal of Diversity in Higher Education, 1*(4), 262-274.

Robinson, W. H., McGee, E. O., Bentley, L. C., Houston, S. L., & Botchway, P. K. (2016). Addressing negative racial and gendered experiences that discourage academic careers in engineering. *Computing in Science & Engineering*, *18*(2), 29-39.

Rossman, G. B., & Rallis, S. F. (2003). *Learning in the field: An introduction to qualitative research*. Thousand Oaks, CA: Sage.

Rutherford, J. (1990). *Identity: community, culture, difference.* Lawrence & Wishart.

Sallee, M. W. (2011). Performing masculinity: Considering gender in doctoral student socialization. *The Journal of Higher Education*, *82*(2), 187–216.

Scott, K. L., Tams, S., Schippers, M. & Lee, K. Y. (2015). Opening the black box: Exploring the link between workplace exclusion, perceptions of envy and worker helping behavior, health and turnover. *European Journal of Work and Organizational Psychology, 24*, 239-255.

Scott, K. L., Zagenczyk, T. J., Schippers, M. C., Purvis, R. L., & Cruz, K. S. (2014). Coworker exclusion and employee outcomes: The moderating role of perceived organizational and social support. *Journal of Management Studies, 51*, 1235-1256.

Smith, D. E. (1990a). *Texts, facts, and femininity: Exploring the relations of ruling.* Abingdon, UK: Routledge.

Smith, D. E. (1990b). *The conceptual practices of power: A feminist sociology of knowledge.* Toronto, Canada: University of Toronto Press.

Smith, D. E. (1999). *Writing the social: Critique, theory, and investigations*. Toronto, Canada: University of Toronto Press.

Smith, D. (2005). *Institutional ethnography: A sociology for people.* Toronto, Canada: AltaMira Press.

Stenhouse, L. (1985). *Field methods in the study of education.* London, UK: Falmer Press London.

Sturm, S. (2006). Architecture of inclusion: Advancing workplace equity in higher education, *The Harvard Journal of Law & Gender*, *29*, 247-333.

Thomas, K. M., Willis, L. A., & Davis, J. (2007). Mentoring minority graduate students: Issues and strategies for institutions, faculty, and students. *Equal Opportunities International*, *26*(3), 178-192.

Vadeboncoeur, J. A. (2009). Spaces of difference: The contradictions of alternative educational programs. *Educational Studies*, *45*(3), 280–299.

Whitchurch, C. (2008). Shifting identities and blurring boundaries: The emergence of third space professionals in UK higher education. *Higher Education Quarterly, 62*(4), 377-396.

Whitchurch, C. (2012). Expanding the parameters of academia. *Higher Education 64*(1), 99–117.

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Thousand Oaks, CA: Sage.

Table 1. AGEP Program Observations

Type of Event	Date	Approximate Number of Participants
Fall Harvest Dinner is a 2-hour networking dinner held before the Thanksgiving break that allows graduate students and postdocs to connect with each other, build collaborative relationships, and expand their network.	Fall 2013 Fall 2014 Fall 2015 Fall 2016	100 100 95 120
Research Symposium and Professional Development Conference is a one-day event that provides students a venue to present their work at any stage, receive feedback in preparation for presenting at large venues, and provides training that will prepare participants for faculty careers.	Spring 2014 Spring 2016	75 95
Summer Success Institute is a one-day conference and networking event that provides professional development for new/incoming graduate students, continuing graduate students, postdoctoral fellows, early-career professors, and professionals in the region.	Summer 2014 Summer 2015 Summer 2016	140 120 175
Professional Development Workshops address a variety of topics related to succeeding in your doctoral studies, future careers and personal lives.		
- Dissertation and Thesis Management Strategies	Fall 2014	35
- Managing Student Loan Debt	Fall 2014	30
- What Works for URM Students in Higher Education	Spring 2016	35
Dissertation House is a multi-day event consisting of presentations that address skills needed for success in the dissertation stage as well as quiet writing time and opportunities to meet for one-on-one consultations with a dissertation coach.	Winter 2014 Summer 2014 Summer 2015 Winter 2016 Summer 2016	15 17 16 13 24
Sisters in the Dissertation House is a 1.5 hour book discussion and dessert session with the author of book "Sisters in the Dissertation House" and PROMISE alumni featured in the book, typically held the evening before the Summer Success Institute.	Summer 2015	14

Table 2 - Illustrative Quotes and Observations from Rounds of Coding

Theme	Illustrative quote or observation
1st round - Initial coding	
Experiences that constrained participants' sense that they belonged in their department and could be successful there	"I'd like [the relationship] to be a bit more personal,...just learning more about how we are, how we came to be in situations that we want to be, being able to speak on a more personal level makes asking certain questions easier down the road." - Student talking about his relationship with his advisor.
	"You are privileged but still experiencing marginalization." - Student talking about how she was privileged for being able to get an education, but still marginalized within academia because of being URM. In the end, she didn't feel like she fit in anywhere - not with her family anymore nor in academia.
Ongoing supportive and positive experiences	"It's a small department so it's very hands on and most of the students usually are research assistants. But I think that is important, too, that you get teaching experience while at the university and that can kind of be hard to come by when you're in a kind of lab-based research intensive program, so our department actually… it's kind of mandatory to do teacher assistantships for one semester. I think that that's a strength. I know that… well, I've been on the job market, that having that additional teaching experience has definitely been a plus."
	"He's always been concerned about how I'm doing. He takes time out to talk to me." - Student talking about his advisor.
2nd round - Negative ruling relations	
Isolation & lack of community	"I didn't realize how much time you spend alone [during the dissertation stage]....All you have left to do is write."
	A student shared how she had to protect her time from family. However, that had the downside that eventually family stopped calling her and she felt even more isolated. She said, "The phone calls stopped coming...when people start to honor your time, you don't know how to reconnect."
Individualism and competition	One student shared how there was competition for lab equipment. He said, "I had to stay up at night because lab equipment wouldn't be available to me during the day, because, for some reasons or reasons during that time, it would be allocated to the other students because my project wasn't a priority."
	"I was very afraid to make a mistake because I was being threatened in the sense that I was told that if you don't get this right and if you don't finish this in a certain amount of time you are gone. So I did not want to bring my mistakes to them."
Hierarchical structures	"What I mean by micromanaged is by, 'okay, every week tell me what it is that you've done in great detail so that I can critique you but not give you any positive or any real nice, any real feedback.'" - Student about his relationship with his advisor.
	Student shared he felt powerless when his advisor hindered his progress. "You can say a lot of stuff and you can do a lot of things,

	but the only thing that will enhance you and get you to where you want to be is unmatched, unparalleled professionalism and courtesy."
3rd round - Aspects of PROMISE that supported students and made them feel that they could succeed in their program and career	
Community	"This [Dissertation House cohort] is a group that understands what you're going through and that's really important to have."
	Event structure: students and faculty/staff seated at round tables together; provided time for formal as well as informal conversation.
Affirmation	"Other people are experiencing this imposter syndrome...it's a real thing." Student shared that learning that others struggled with imposter syndrome helped her overcome her fears and succeed.
	"Remember who you are. Re-read your statement of purpose. You need to get [your swagger] back. We didn't make a mistake, and even if we did, make us pay for it and get your Ph.D." - Dissertation House coach to students.
Egalitarianism	"I hope that you take seriously this process, because this process will help you for the rest of your life.... You can think about the whole PhD as a process; it's the process of learning to do structured research.... It doesn't really matter what your dissertation is on. It's just proving that you learned the process and can demonstrate it to a committee of people. Think about the fact that it is a process; you are demonstrating the process; and you got the rest of your life to do this ground breaking work."
	Event structure: students and faculty/staff participating in activities together (e.g., Sisterhood of the Dissertation House, Fall Harvest).