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Walking on Gender Tightrope With Multiple Marginalities: Asian International Female Students in STEM Graduate Programs

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ABSTRACT

This phenomenological research explored how Asian female international students (AFISs) understand the role of gender in their program experiences and how they cope with the challenges derived from their multiple marginalities—gender, foreign nationality, and race/ethnicity. Based on in-depth interviews with 21 Asian female international graduate students enrolled in various science, technology, engineering, and mathematics (STEM) disciplines, we analyzed the ideological undercurrents embedded in their genderblind perspectives and examined their coping strategies in the context of STEM disciplines. Our thematic findings illustrate the participants’ multiple marginalities as manifested in the concept of “gender advantage,” and the precarious power dynamics and ironic coping strategies that they adopt in undergraduate teaching contexts. This study suggests that STEM educators in higher education understand the multifaceted struggles of AFISs who inevitably embody multiple marginalities in their graduate programs and provide culturally relevant support and advocacy-based professional mentoring.

Keywords: acculturation, female students, international students, STEM students

INTRODUCTION

As the world becomes increasingly interconnected, universities and colleges across the United States have attracted many international students (Institute of International Education [IIE], 2020). In American higher education, international students play a significant role in supplying a high-skilled workforce in science, technology, engineering, and mathematics (STEM). For example, during the 2017–2018 academic year, 825,699 international students were enrolled in either undergraduate or graduate degree programs in the United States (IIE, 2020). Of this group, 49% of the students majored in STEM; 46% were graduate students. This trend explains the ever-increasing number of doctorate recipients of international origins from 16.78% in 1985 to 31.89% in 2017 (National Science Foundation [NSF], 2018).

Women's disproportionately low participation and high attrition in many STEM disciplines has been the topic of great importance in the United States and globally. In the United States, females hold less than 25% of STEM positions, despite the reality that women make up nearly half of its general workforce (National Girls Collaborative, 2020). Statistics about education pipelines are not optimistic. NSF (2018) statistics on doctoral recipients in STEM indicate that females are still underrepresented in most STEM fields except life sciences. Women accounted for only 33.1%, 25.4%, and 24.9% of those majoring in physical and earth science, mathematics and computer sciences, and engineering (NSF, 2018). These statistics confirm that females have not yet reached parity with their male counterparts in most STEM fields (Wang & Degol, 2017).

Recent NSF data indicate that international female students enrolled in U.S. STEM graduate programs play a pivotal role in replenishing a highly skilled workforce where the current void of female talents remains in the STEM pipeline (Tonso, 2007). According to data from the NSF (2018), international female students who are temporary visa holders represent 31.5–45.3% of female doctoral recipients in STEM fields. The majority of these international female students—like their male counterparts—are from Asian countries, such as China, India, South Korea, Pakistan, Bangladesh, Iran, and Turkey (NSF, 2018). Despite the significant role played by these Asian female international students (AFISs) in STEM graduate programs and future workforce, there have been very few studies on these students.

The purpose of this phenomenological research is to understand the gendered program experience of Asian female international graduate students in various STEM disciplines in the United States. These students are a unique group of individuals embodying multiple layers of marginality as racial/ethnic minority women in male-dominated STEM disciplines and foreigners using English as a foreign/second language in the host society. In this study, we selected gender and foreign nationality as the two primary axes of our analysis, given the unique disciplinary contexts of STEM. We acknowledge that these students' experiences in American higher education manifest the complex intersections of multiple marginalities, including yet not limited to gender, race/ethnicity, immigration status, language, and culture. However, STEM disciplines have long been

criticized for their low representation of women and, therefore, are actively seeking female talents at all levels (Blackburn, 2017). With the growing presence of international students and faculty members in many STEM fields, we believe these two factors set the STEM disciplines apart from other fields of studies in which most previous studies on international female students were conducted (Le et al., 2016). The following research questions are posed:

1. How do AFISs envision the role of gender and foreign nationality in their STEM program experiences?
2. How do AFISs cope with or counteract the challenges derived from their embodied marginalities, gender, and foreign nationality inevitably complicated with their race/ethnicity?

LITERATURE REVIEW

Acculturation of International Students in American Higher Education

Scholars have long acknowledged that acculturation plays a critical role in determining the degree to which international students successfully progress throughout their academic program and professional career (Woo et al., 2015). Berry (1997) explains that acculturation is a complex process of cultural adaption by individuals who have close contact with another culture, typically the host society's culture. His typology presents four modes of acculturation—integration, assimilation, separation, and marginalization—based on one's maintenance of heritage culture and acceptance of receiving culture. Research indicates that acculturation impacts one's career decision self-efficacy (Nadermann & Eissenstat, 2018), as well as their career aspirations and career outcome expectations (Reynolds & Constantine, 2007).

As strangers on foreign soil, international students' acculturation process is inevitably plagued with multiple challenges. Contreras-Aguirre and Gonzalez (2017) synthesized that psychological/sociocultural adaptation and linguistic proficiency development are two major challenges faced by almost all international students. Researchers also found that the lack of meaningful social interactions and a sense of isolation posed a significant challenge to international students (e.g., Le & Gardner, 2010; Woo et al., 2015). As a result, scholars advocated the value of a peer-support system with a mentor or other students of similar cultural backgrounds (Ku et al., 2008; Le & Gardner, 2010) to improve their learning experiences and program completion.

Previous studies on international students have provided important knowledge on their acculturation process and adaptation strategies. However, international students comprise a highly diverse population, including numerous subgroups of students. They are also spread across the broad spectrum of all disciplines; each discipline naturally contextualizes their acculturation experiences and professional development (IIE, 2020). Still, current scholarship on international students has rarely considered the impact of a specific disciplinary context (e.g., STEM) or the complexity of one's acculturation as a

member of a doubly marginalized group in the discipline (e.g., Asian female students in STEM graduate programs).

Cultural Contexts of Losing Female Talents in STEM Pipelines

The influence of patriarchy, a powerful cultural system that enforces structural male dominance and female subordination (Ortner, 2014), can be found around the globe even though the degree of intensity may vary from society to society. Not surprisingly, patriarchy has long functioned as a significant barrier to women's education and upward mobility (Dlamini & Adams, 2014; Sultana, 2010). Society with strong patriarchal/patrifocal cultural domination poses multiple challenges to young women pursuing a professional career in STEM, a field regarded as a male domain (Gupta, 2012). Influenced by patriarchal social norms, parents are likely to hold a lower expectation for their daughters pursuing a STEM career as they believe that women are not as competent as men in these fields (Yang & Gao, 2019). STEM programs in higher education and academia are hardly an exception from the influence of patriarchy prevalent in society. Mozahem et al. (2019) found that female engineering students in Lebanon suffered from being ignored and undervalued as their qualifications were constantly in question in the workplace. Therefore, it is not surprising that many female international students from Asian countries with explicit patriarchal domination develop a favorable view of the American cultural environment that seems to uphold individual aspiration, accomplishment, and meritocracy (Dutta, 2015; Le et al., 2016).

However, American education and society are not exempt from the subtle and continuing influence of patriarchy. Miller (2015) confirmed the prevalence of gender stereotypes in math and sciences when he found that children as young as six consider math and science a male domain. In their review of recent studies on women's career advancement in STEM, Wang and Degol (2017) found that parents still shape their children's math learning experience and performance by holding higher expectations for their sons than their daughters. They concluded that the implicit stereotyping and bias discouraged many young women from pursuing a career in STEM. Hart (2006) reported that women academics in STEM experience different levels of pressure in their careers because the standard of success is defined on the male norm. Career interruptions due to added family-related responsibilities are hazardous to promotion opportunities. There is a significant gap of female scholars of publications in highly competitive STEM journals, fewer citations of female scholars' work compared with those of males, and fewer collaborations with women than men in research and related publication (Hart, 2006).

International Female Students Bearing Multiple Marginalities

Studies illustrate that female students and professionals face multiple forms of social prejudice deeply aligned to male domination of most STEM fields, which portrays female leadership and cognitive ability as weak and inadequate (Chen &

Moons, 2015; Mozahem et al., 2019). Moss-Racusin et al. (2012) reported that science faculty maintained implicit bias against female applicants as they evaluated male applicants with the same qualification as more competent and hireable. As the minority, female students in STEM majors need to adapt themselves to the male-dominated classroom/program culture (Blackburn, 2017) while feeling discriminated against because of their gender and threatened by the gender stereotype (Dutta, 2015). Female students with less access to other female peers tend to lack a sense of belonging (Herrmann et al., 2016), possibly influenced by their low level of perceived similarity (Cheryan & Plaut, 2010). Due to the low representation of women in STEM fields, female students are more likely to have fewer support resources than their male counterparts. Young et al. (2013) argued that more female professors and role models are needed for female students to counteract the hidden gender stereotypes and to conceptualize sciences as a gender-neutral domain.

Challenges faced by international female students in STEM are even more complex. These students often suffer not only from structural and academic constraints but also from cultural constraints (Dutta, 2015). International female students' struggles in STEM fields are inevitably complicated with the long-standing power dynamics of their disciplines as male domains that discounted and rejected women's qualifications and contributions. In her recent study, Dutta (2015) found that international female engineers faced many problems, including "exclusion, marginality, underrepresentation, and a chilly climate" (p. 328). Amon (2017) has explained that power and authority do not come easily to STEM women; they need to exert more and conscious efforts to gain recognition and authority than males with the same qualifications and capabilities.

By adding another layer of multiple marginalities, an Asian female speaking with a strong foreign accent, Asian female professionals in STEM are likely to face a heightened level of challenges in their career development (Dutta, 2015). Research shows that Asian female professors in U.S. higher education are the least recognized for their academic expertise and instructional authority even in the disciplines without women's underrepresentation issues (Mayuzumi, 2008). Wu and Jing (2011) provide grim statistics unveiling the double ceilings—a glass ceiling for women plus a bamboo ceiling for Asians—that halt the career advancement of Asian female professionals in STEM. Minimal numbers of Asian female scientists and engineers advance to a leadership position in academia or industry. Only 20% of Asian female scientists and engineers hold a tenure track position in academia; the remaining 80% of this population work in nonfaculty positions, such as postdocs, research associates, and lab assistants (Wu & Jing, 2011). As a result, Asian women scientists and engineers fall behind not only men but also White women and women of other underrepresented groups.

METHOD

This qualitative study is based on interpretive phenomenological analysis (IPA), a branch of phenomenological research that aims to understand people's shared life experiences within a specific sociocultural context (Smith et al., 2009). IPA

preserves the inductive nature of phenomenological research traditions (e.g., grounded in the authentic voices of participants) while paying close attention to the sociocultural contexts in which human experiences unfold. It recognizes people's capacity to draw meaningful interpretations (i.e., how people construct shared meanings in a specific cultural context) and acknowledges possible variations across individuals.

The sample includes 21 Asian female international graduate students enrolled in various STEM disciplines at an urban public university in the United States with an enrollment of approximately 30,000 students (See Table 1). This study was conducted by a team of researchers consisting of a faculty member and four Asian female international graduate students. The research team conducted an in-depth interview with each of the 21 participants recruited through personal connections, individual referrals, and/or IRB-approved solicitation email. All interviews were guided by an interview protocol listing questions about the participants' past and current educational experience, cultural transition experiences, and career trajectories. Almost all interviews, with a few exceptions, lasted between 40 and 90 min, and were audio-recorded and transcribed using pseudonyms. The interview protocol used for those working as a teaching assistant (TA) included additional questions about their teaching experience and instructional strategies. Nine interviews were conducted in Chinese, and the remaining 12 interviews in English.

Table 1: Participant Program Affiliation, Nationality, Degree, & TA/RA Assignment

Pseudonym	Program	Nationality	Degree	TA (Tasks)
Farah	Optical science/engineering	Iran	PhD	RA
Fedora	Optical science/engineering	Iran	PhD	RA
Rui	Mathematics	China	PhD	RA
Tienni	Civil/environmental engineering	India	PhD	RA
Shapla	Software information system	Bangladesh	PhD	TA (Tutoring)
Friya	Mechanical engineering	Bangladesh	MA/PhD joint program	TA (Grading)
Yao	Mechanical engineering	China	PhD	TA (Grading)
Weiwei	Mechanical engineering	China	PhD	TA (Grading)
Pema	Mechanical engineering	India	Masters	RA
Shirin	Infrastructure/environmental engineering	Iran	PhD	TA (Tutoring)
Xing	Infrastructure/environmental engineering	China	PhD	RA
Chang	Healthcare informatics	China	Masters	RA
Suzy	Infrastructure/environmental engineering	South Korea	PhD	TA (Grading)

Pseudonym	Program	Nationality	Degree	TA (Tasks)
Zhaoyi	Mathematics	China	MS/PhD joint program	TA (Grading)
Jingya	Mathematical finance	China	Masters	TA (Grading)
Juhee	Mathematics	South Korea	PhD	TA
Jien	Mathematics	China	PhD	TA
Jin	Mathematics	China	PhD	TA
Viet	Mathematics	Vietnam	PhD	TA
Merhy	Mathematics and statistics	Iran	PhD	TA
Yun	Applied mathematics	China	PhD	TA

For data analysis, the research team used thematic analysis (Ezzy, 2002), starting with a careful reading of each transcript to identify salient themes and significant variations across the participants. We examined each emerging theme in light of gender and foreign nationality and selected those that presented clear evidence in relation to the two axes of marginality. NVivo, a qualitative data analysis software package, was used to cross-check the consistency and intensity for each proposed theme across multiple cases. It is important to note that four student researchers on our team had intersecting social and cultural identities with the participants. The convergence of their and participants' identities allowed them to build instant rapport and facilitated candid and authentic conversations. Still, the student researchers observed a significant difference between their own acculturation experience and those of the participants—mainly due to the contrasting disciplinary contexts (education vs. STEM). This helped the team to engage in a series of dynamic discussions and the analysis of ideological undercurrents and professional development stages, which ultimately yielded novel interpretations of some unexpected and seemingly contradictory findings (e.g., some participants' endorsement of "gender advantage" and others' rejection of it). The team's collaboration throughout the research process contributed to the overall trustworthiness of findings and interpretations that linked back to existing literature.

FINDINGS

Gender Blindness: Restored Individuality and Claiming Meritocracy

One of the most salient and consistent themes that emerged from our participants' narratives was their conviction that gender was not an issue in their programs. Friya, a PhD student in mechanical engineering, firmly stated, "Gender is not an issue," and "I don't think people here distinguish between male and female. And there is no way you can feel different way as a female student." Participants across the entire spectrum of STEM unequivocally made this gender-blindness claim even though some acknowledged that "there are more male students (Weiwei)" in their program; Shirin, another engineering PhD student, concurred though she conjectured that being female may pose an additional

challenge as she moves to the industry outside, “maybe work environment is different, but here at the university I don’t see any issues because they (faculty) are trying their best to say ‘you’re all equal.’” Most participants perceived that their program experiences were not negatively influenced by their gender. Rather, they felt that they enjoyed equal status with male students in their program.

There were two noteworthy undercurrents in the participants’ denial of gendered aspects of their program experiences. First, their sense of gender equality was grounded in their prior experience in a homeland where explicit patriarchy—rather than subtle or hidden—bluntly constrained their academic and professional endeavors. Pema recollected her prior experience in India where she frequently experienced “a fear since I’m a female, ‘will I have any sort of discrimination?’”

[In my current program] Everybody treated you as the same. From them, nothing matters like me, female [or] male. Gender won’t matter to me. It’s like you just have to concentrate on your studies, your work. All that matters is what you are working. At the end of the day, what are you doing. Here people don’t judge you by your family. People judge you the way you are—the way you are as an individual. No one is asking [about] where I’m coming from, who are my parents, I belonged to which region, or who’s my husband [and] how is he doing. No one is bothered about that. They just want to know who I am, how I’m doing, what I feel, [and] what I think. It doesn’t matter I belong to which family. It gives me empowerment. Yes. I feel, I feel empowered. I feel the importance.

Nearly all the participants’ experiences had been shadowed by their prior cultural upbringing in their homeland that emphasized hierarchy and rigid gender roles. They defined, “my home country is male dominating culture” and “in my country, men and women are not treated equally.” Many participants experienced a very explicit constraint as women in their previous schooling or professional experience ranging from male peers’ refusal for collaboration to institutionalized restriction for women’s career choice. Shirin, an Iranian student, mentioned that female students in her country, despite their academic talents or professional interests, are not allowed to choose certain majors that are open exclusively to men. Therefore, Shirin concluded that “if I want to compare with my home country, there’s no problem at all here.”

It is important to note that the participants’ narratives of “gender blindness” reflected their newly found individual agency and desire for recognition on their merits and hard work. To many participants who were brought up in a society with strong patriarchal social and cultural influences, receiving recognition for their individual merits and accomplishments did not come naturally. Tienni, an Indian student, provided a critical, self-reflection about how she—and other women—gradually internalized the idea of women’s inferiority and accepted their subjugated position as normal and natural.

They do not give credit to your hard work. They do not acknowledge it. And we also accept it that way. Or over a period of time when people say

all the time to you that this goes to your family, family, family. Then, over a period of time, you start feeling it—that's because of your family, although it's your hard work.

Having restored the sense of individual agency and hope for professional success in America, the participants expressed a strong desire for self-improvement, proactive engagement, and hard work, all of which are critical pillars of meritocracy. Merhy, an Iranian PhD student, agreed revealing her goal-driven mindset, "I have some goals that I want to achieve. And I think if I want to have self-development and growth, I need to experience more." She expressed a firm genderblind perspective claiming that she was neither neglected nor treated special in her graduate program.

Well, I can't really see any difference between female and male students in my department. We are treated the same. We teach, [and] we work the same amount of time. And we don't, we are not neglected, nor you are getting extra special treatments. Yeah. In my department, I really don't see a difference between female or male students.

STEM disciplines' selective and competitive nature (Slaton, 2010) was also a part of the participants' argument on "gender blindness." Participants felt proud of being recognized as smart students by others on campus. When discussing gender issues in their programs, they often referred to their program's competitive admission process as a key genderblind practice. Friya proclaimed, "if you have a qualification, you can get in here. Gender is not an issue." AFISs' strong endorsement of "genderblind" program environment was deeply intertwined with the claim of their individual merits; it reflected their desire for successful career development that seemed possible in American higher education, at least in their perspective. Schwartz et al.'s multidimensional acculturation model (2010) and related empirical studies (e.g., Interiano-Shiverdecker et al., 2019) confirm that a significant change in one's value system epitomizes their successful acculturation. In that light, the AFISs' "genderblind" perspective should be interpreted as their active sense-making and value reconfiguration, rather than a passive observation or simple misunderstanding of their program environment.

Uncharted Journey for Professional Success

All participants in this study engaged in multiple adaptation strategies ranging from intentional and proactive facilitation of self-acculturation through various social relationships (e.g., academic mentors and peers on campus) to an extreme devotion to academic or research goals while sacrificing other aspects of their personal lives. An exclusive focus on academic work and professional development was evident across all participants; in some cases, they pushed it to the extreme. Suzy explained her life as a graduate student:

I spend most of my time in the library and just study. I didn't really put any play time during the weekdays so that I can be more focused on

homework and everything. So when the weekend comes I can be done with most of the things that I can do.

Jingya constantly reminded herself to stay “focused on study, focused on classes, and don’t focus on the life. Don’t focus on smaller things in life.” She considered her most basic needs such as “where should we live” and “how can we take care of ourselves” as unimportant matters. She complained that “these life-trivial takes too much time, too much energy [from] us.” While the participants’ exclusive focus on their academic work and professional goals yielded some positive outcomes (e.g., high GPA or key competency/skill development), it sometimes prevented them from accomplishing more holistic growth and acculturation. Pema, a master’s student, offered her hindsight; “I’ve actually not learned too much of cultural lessons because it’s just been my studies, and I didn’t have enough time to actually learn from other people.”

The diversity and strong presence of international students in STEM programs and the dearth of female representation at all levels, especially at the professorial levels, are two important contexts to understand our participants’ cultural adaptation process—which sets their experience apart from those in humanities or social sciences where international students instantly become minoritized by their race/ethnicity, language, and nationality. Rui, a Chinese student, explained the demographical and cultural diversity in her program stating:

In my class, there are so many different types of students who look different, who talk different, who got different accents. The region is different. So at least I feel so comfortable with them and it supports me a lot, a lot. I never feel alone. I never feel secluded.... So that’s the most helpful part because I can see so many different people. So I feel comfortable.”

When Jin explained her proactive help-seeking behaviors, she plainly laid out multiple options such as “choos[ing] to discuss [it] with classmates or consult with our teacher.” To her, finding academic support from peers and professors was not an issue as more than half of the entire faculty and graduate students were international.

In most cases, the participants’ core support system presented the characteristics resembling the concept of “familial capital” (Yosso, 2005). It was developed within their ethnic community or with other Asian international students sharing a sense of common cultural intuition. The support system was also holistic in nature, encompassing their psychological, social, academic, and professional needs. Xing who had to develop English writing skills found a willing tutor who understood ESL learners’ typical mistakes. Pema experiencing emotional challenges found her “comfort zone” and received consolation. Many participants working in a lab or completing a small group project received senior students’ support and/or peers’ reciprocal academic support. Weiwei recollected great support that she had received from another Chinese student who offered her thorough, step-by-step guidance about how to do a literature review, design an

experiment, and write a paper. She also expected that further authentic professional guidance and support would be available for her from the Chinese scholars and professionals who “lived in United States for a very long time, so they are very familiar with what I’m going through.”

Existing literature emphasizes the importance of mentoring in facilitating international students’ professional development and acculturation (Le et al., 2016). However, only five students in our study mentioned their professors providing some type of mentoring for their cultural adaptation. The most common acculturation advice from their mentors was to correct their “shy” disposition and become more proactive. Weiwei recollected one critical conversation with her advisor.

He told me that ‘in this society, you need to sell yourself. You need to communicate with others even though you don’t know what to talk [about] with them. You need to find some topics and once you get familiar with them, you can get more chances in your research and in your career.’

Participants also found immigrant or transnational faculty members were more willing to work with them and provided additional support and guidance that they needed.

Not only was the number of participants having a meaningful mentoring relationship small, but no participant referred a faculty member as their role model. Based on the dearth of female faculty members, even rare international female faculty members or female professionals in their own STEM fields, it was simply hard for them to find someone into whom they could project their future. Given the severely limited mentoring and role modeling opportunities, the participants’ only solution was to resort to peer mentoring with another graduate student in an advanced stage of their studies. For example, Pema referred Yao as “an example” and “an inspiration” praising her confidence, task proficiency and accuracy, and strong work-ethic. “If I happen to look at her and I’ll be like, yeah, she’s doing a wonderful job. I want to do at least half of what she is doing.” Suzy also considered her friends, two Asian female PhD students “working so hard” at another institution as her role model. While identifying a role model among available peers was a creative and necessary coping strategy, it was hard for these students to envision their career path beyond the few remaining years in their program of studies.

Irony of Success and Looming Troubles: Exploited Marginalities Inside and Outside

One of the most compelling findings in this study was the participants’ changing experiences and perspectives as they progressed through their program of study. Those who were relatively new to the United States tended to make cultural references back to their homeland and expressed a positive outlook about the gender-equitable environment in their graduate program. However, when they successfully accomplished each required academic and professional milestone,

they gradually learned about their marginal status as AFISs in a male-dominating field.

Some participants in our study, especially those in a master's program and/or in the early stages of their doctoral journey, expressed that women had advantages in their STEM fields. They noticed that they could gain extra support since their program wanted to increase women's enrollment and retention. Fedora, an Iranian doctoral student, stated that "being female is better in our major because the group is smaller," and "they (faculty members) prefer to have some females. They give more chances for females to show themselves. [So] Maybe it's better to be a female."

However, those in the later stage of their program became more aware of the contradiction and demeaning connotation embedded in that idea. Responding to a question over "female advantage," Merhy stated:

Many students would say that universities are trying to admit more female students in our program because then later they can say, 'hey look! We have so many girls in our program...' I personally don't agree with them because if I agree with that, then I have to go back and think the reason that they admitted me here was that I was a girl? I wasn't qualified? Or because I'm a woman of color, they just need more international girls to get more money?

To Merhy, the concept of female advantage squarely contradicted her conviction in meritocracy. It questioned and discounted her qualification and competency as a legitimate member of her current academic program.

Yao, a successful fourth-year doctoral student in mechanical engineering, directly experienced the damaging impact of the discourse of "female advantage." She explained an unpleasant encounter with one of her international male colleagues who had explicitly discounted her qualification for earning a prestigious merit-based scholarship from a top professional association and attributed the award decision to her "female advantage."

Jingguo said I received XX scholarship all because I am a female. He did not get it because he is a male. (He believes) we have a similar background, but I got the scholarship because I am a woman. Some people may think you take advantage of being a woman because there are some guidelines to ensure [gender] equity. So, there could be some cases when the guidelines help ensure a certain quota for women... [however] I think gender did not play an important role in the [award] result. I think I earned it.

Yao was an exceptional doctoral student who already had over ten years of successful professional experiences. Yet, she found the concept of "female advantage" virtually obscured her merit and qualification for the award. Through a bitter way, Yao learned that "females are a minority in engineering or STEM" and their accomplishments would cause "concerns to the majority (males)" who consider females' accomplishments as unfair "privileges." Yao's experience revealed her double minority status subject to the gendered power relations

existing in the STEM community of international students and scholars (Wu & Jing, 2011). Her cherished professional community turned out to be another male-dominating sphere where women's qualifications and leadership are constantly under scrutiny or viewed as an unpleasant challenge to the established gendered hierarchy (Dutta, 2018).

The most perilous space where the multiple marginalities of AFISs are callously exposed and exploited was not within their graduate program but in the undergraduate classes they taught. Based on their marginal status as foreign female TAs who were still developing their English language proficiency, they experienced not only implicit microaggressions but also explicit disrespect and even blatantly rude behaviors by noncompliant undergraduate students. Initially, most participants considered their English proficiency was the main cause for all of their troubles in teaching, yet soon they realized that it was not a language issue but a larger and more fundamental problem—a lack of instructional authority due to others' (especially their undergraduate students') refusal to acknowledge it. Juhee, a fourth-year doctoral student in mathematics, pinpointed what was at the heart of all troubles experienced by almost all Asian female TAs including her. She declared that “we don't have much authority.” Jien, a Chinese doctoral student TA and a teaching award recipient, stressed that she was conscious of the fragility of her instructional authority in her classes. She emphasized, “here you really have to be in authority. Otherwise, they will sense it.” She evaluated that most “graduate TAs teaching the class don't have this authoritative image.” She worked extremely hard to present herself as a perfectly prepared instructor on day 1 “so that they [undergraduate students] project me as, you know, an authoritative and professional image.”

Discovering their vulnerability as ones embodying multiple marginalities and, therefore, unable to claim their instructional authority to noncompliant undergraduate students, AFISs had very few resources and strategies to use. Almost all TAs in our study confessed that they had experienced multitudes of negative emotions such as frustration, anxiety, depression, helplessness, and self-blaming. When their linguistic proficiency improved and language was no longer the primary issue to explaining their challenge, the participants discovered their lack of instructional authority is explained only by the intersectionality of their multiple marginalities by race, gender, language, and foreign nationality.

The most ironic revelation was that these Asian female TAs, in the absence of proper mentoring and faculty's support, resorted to their old feminine virtue of “being nice” to avoid a further conflict in their teaching situations. Jin explained, “as international students, we are a little bit shy and timid. We do not dare to argue with them (rude/disrespectful undergraduate students).” She also found the suggestions provided by other American TAs would not work for her or other international females TAs.

They (American TAs) said we could tell the students in a stern manner, ‘you are distracting other students. If you do not want to listen, you can just leave.’ However, we may think it is not a proper way. So, we don't dare to do something like that. We are always trying to be nice.

Juhee, a Korean TA, reached to the same conclusion that her “being nice” strategy satisfied her students protecting her “tiny” self from further troubles.

They (students) want me to control the class but not standing up and saying anything to the dead rude person. ... Now I feel like I know how to do it. My strategy is being nice to them. I’m tiny so I cannot say ‘Ok, so do this one!’ They won’t follow. They’ll ignore me and they’ll be rude to me. They don’t listen. So, my strategy is being nice to them. If I am smiling and try to be nice, they [would] just respect me. They’ll try to follow me even if I make a mistake. They’ll try to understand me and say, ‘it’s okay, you’re doing good’ It’s funny. I just change my strategy and it’s like I have different students.

DISCUSSIONS AND CONCLUSIONS

Findings from this study largely confirm the existing literature that has long reported the arduous acculturation process experienced by international graduate students (Dutta, 2015). However, this study provides a unique and important insight into one of the most marginalized groups of students in higher education, AFISs in STEM, who are facing multiple marginalities based on their race, gender, nationality, and language (Contreras-Aguirre & Gonzalez, 2017).

The participants’ contradictory perceptions of two interrelated concepts, gender blindness and gender advantage in STEM, call for a critical scholarly discussion. While the “genderblind/colorblind” perspective of international female professionals in STEM has been reported in previous studies (Chen & Lawless, 2018; Dutta, 2015), scholars have thus far failed to enact a meaningful interpretation of this puzzling phenomenon. There seems little doubt that the participants’ contradictory endorsement of genderblind program environment and gender advantage was largely shaped by the traumatic memory of gender discrimination back in their homeland and their continuing vulnerability in their current STEM graduate programs. However, we found that it was also a way for them to claim their individual merit and agency mingled with a sense of relief that they are now in good hands. These students have dissociated themselves from their past patriarchal value system and accepted meritocracy as an alternative cultural frame through which their graduate program experiences are interpreted. Therefore, it is reasonable to interpret the participant’s claim of gender blindness in STEM programs as an important—even inevitable—stepping-stone in their acculturation process, which symbolizes their departure from their old frame of cultural reference and accepting new values that help them adapt to the new environment and most importantly empower them as aspiring professionals.

Our findings provide a poignant insight about when and how significant challenges arise for Asian female international graduate students in STEM. When they successfully progressed through their program and reached the point to compete for limited resources and recognition, multiple forms of implicit microaggression and explicit backlashes ensued. Yao’s struggle to earn fair recognition for her accomplishment by other international male peers manifests

the deep-seated prejudice against women in STEM fields as males' areas (Wang & Degol, 2017). While the female students' talents and contributions were acknowledged and sometimes even exploited by other male peers, such acceptance was possible when the female students remained humbly in the lowest rung in their research lab's hierarchy.

The most arduous challenge occurs when the international female graduate students have to play a role of authority in an unprotected space of STEM education when their instructional authority is compromised by their marginal status in society and STEM discipline. International TA's struggles in teaching undergraduate STEM courses epitomize this ironic, yet inevitable rupture of their multiple marginalities callously exposed and exploited in a precarious power relationship with American undergraduate students. What we found even more ironic is that the international female students ultimately adopt a strategy that reconnects them back to their initial cultural upbringing—being nice and kind—and use the cultural ideology of feminine virtue as the basis for their internal and external coping mechanism. This finding is not surprising since resorting to amplified feminine identities and dispositions has been known as one of the most common strategies adopted by international female scholars who struggled to claim their administrative, academic, and instructional authority in academia (Hernandez et al., 2015).

While offering important insights about AFISs in STEM graduate programs, this study presents several limitations. While we acknowledge the multifaceted nature of AFISs' acculturation experiences in U.S. STEM programs and the intersectionality of multiple marginalities, our analysis and major findings in this paper centered on the gendered aspect of their experience. As a result, other important axes of their marginalities, such as language and race (Dutta, 2015), were not fully explored in this paper. Second, our findings are the participants' lived and interpreted experiences as graduate students in a specific stage of career development, which would naturally evolve throughout their professional pathway. Therefore, there is a need for further, longitudinal research that traces these students' unique challenges, coping strategies, and success factors using multiple sources of data (e.g., repeated interviews with each participant throughout the program) and preferably in various institutional contexts to enhance transferability.

Tapping into women's talents to diversify the existing STEM workforce and create a more equitable society is an important task given to STEM educators in the United States and around the world. There is little doubt that aspiring international female students are a valuable resource who, with proper mentoring and support, would positively contribute to equity and excellence in STEM disciplines. Yet, it is difficult, though not impossible, to provide culturally relevant support (Cho & Yu, 2015) and professional mentoring (Ku et al., 2008) without recognizing their multifaceted struggles as a minority with multiple marginalities in STEM graduate programs. Therefore, we suggest that this study serves as a stepping-stone toward more advocacy-oriented research on diverse groups of international female students and scholars in STEM fields as well as others located at the intersection of multiple marginalities.

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