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Normalizing Struggle: Dimensions of Faculty Support for Doctoral Students and Implications for Persistence and Well-Being

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ABSTRACT

Faculty mentoring is a durable structure of doctoral education that facilitates intellectual growth, professional socialization, and progressive independence. We must more deeply understand, however, professors' role in supporting doctoral students' persistence and well-being, especially for students from groups who have been historically excluded and marginalized in their fields. This study strived for such understanding by evaluating findings of a phenomenology of faculty support in 4 high-diversity science, technology, engineering, and mathematics PhD programs at 2 research universities. I found that holistic faculty support has academic, psychosocial, and sociocultural dimensions, which faculty enact through specific behaviors. Students reported meaningful experiences with faculty that normalized struggle and failure by promoting a growth mind-set, validating student competence and potential, and opening discussion about racialized and gendered dynamics in academia. Collectively, these activities may prevent students from misconstruing the difficulty of graduate school with their ability to succeed. The article discusses how the findings may advance future higher education research and faculty professional development.

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Decades of analysis have documented low degree completion rates in U.S. PhD programs, with national averages reported recently by the Council of Graduate Schools topping out at 60% or less for all fields and all racial/ethnic groups (see [Figure 1](#)). In exploring the determinants of PhD completion and attrition over which faculty have some control, scholars have identified crucial roles for students' (mis)match with one's department and discipline (Golde, 2005), their socialization to independent research (Gardner, 2008, 2010), and the climate that students encounter (Lovitts & Nelson, 2000). Building on knowledge about the importance of disciplinary and departmental contexts and the climates and support structures therein, the goal of this study was to identify the forms of support that doctoral students from historically excluded groups define as salient to their persistence and well-being. To meet this goal,

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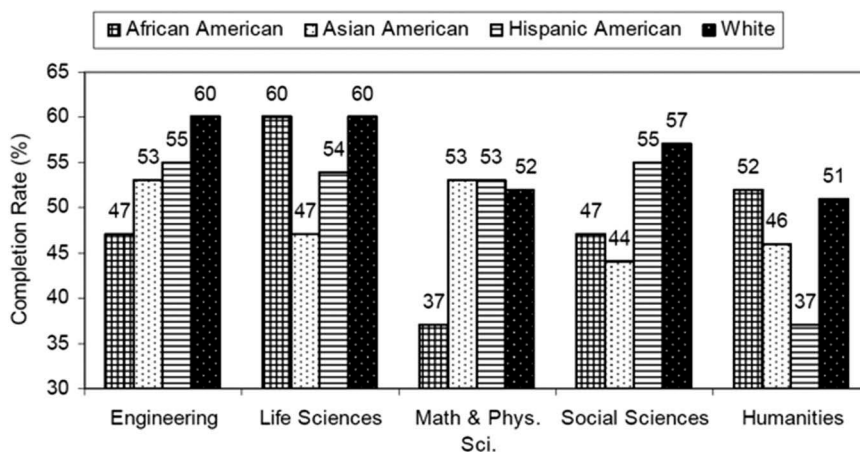


Figure 1. PhD completion rates by field of study and race/ethnicity. *Source:* Council of Graduate Schools (2010).

I documented findings from qualitative inquiry about the nature of faculty support in high-diversity, high-selectivity PhD programs, and I aligned these findings with those of previous studies to develop a framework for conceptualizing holistic faculty support in doctoral education. Consistent with a constructivist standpoint and commitment to improving how faculty educate historically marginalized groups, I examined forms of faculty support that women and Black, Latino, and/or Native American students themselves defined as salient to persistence and well-being.

Literature review

Persisting racial and gender inequities in doctoral education are reflected not only in who is present and absent or included and excluded; inequities are also evident and institutionalized in routine patterns of interaction, in embedded cultural beliefs about intelligence and belonging, and even in how subject matter and intellectual paradigms are constructed (Posselt, Reyes, Slay, Kamimura, & Porter, 2017). These social realities present students from minoritized backgrounds with unique and added challenges; thus, academic assistance is likely to be but a starting point in how they conceive support. We need to know much more about the types of faculty–student engagement that students expect and feel that they would benefit from—even if, in the end, professors choose not to provide every type. In this section, I review literature on distinctive characteristics of doctoral education relative to other sectors of the educational system, while emphasizing the forms of engagement with faculty students may necessitate.

Learning, rigor, and academic support

Baker and Lattuca (2010) defined learning as “a social and cognitive process through which individuals become increasingly able to participate in the activities associated with a particular social context” (p. 812). The cultural expectations associated with learning in graduate education prepare students for specific professional contexts and distinguish graduate education from undergraduate education in important ways; these expectations imply the need for a unique approach to faculty support. In this study, I focused on PhD programs, which expect students to develop and demonstrate abilities required for a specific type of work—original, field-specific research. This type of work hinges on cognitive complexity and the use of higher-order thinking skills that are central to contemporary conceptualizations of rigor (Braxton & Nordvall, 1985; Nordvall & Braxton, 1996). Without analysis and synthesis, one cannot develop research questions or construct conceptual frameworks, for example, nor can they design coherent methodologies, interpret data, or locate the significance of findings within the broader landscape of current knowledge.

Another expectation of doctoral education is that student scholarship will push the frontiers of disciplinary knowledge. Subject-matter learning is a core process of scholarly life throughout one’s career (Neumann, 2009), and being a “master” of the art or science of one’s field is but a preliminary benchmark or qualifying characteristic for doctoral students. Students must also grow to become “stewards of the discipline,” according to the Carnegie Initiative on the Doctorate (CID), who “creatively generate new knowledge, critically conserve valuable and useful ideas, and responsibly transform those understandings through writing, teaching, and application” (Golde & Walker, 2006, p. 5). As the CID summarized, doctoral education is an enterprise centered on the “formation of scholars” (Golde & Walker, 2006; Walker, Golde, Jones, Bueschel, & Hutchings, 2008).

Along with the CID metaphor of formation, scholars have related teaching and learning at this level to traditional and cognitive apprenticeship, as well as to scaffolding. Collins (2006), a leading scholar in the learning sciences, delineated the two models of apprenticeship, which have bearing on the current analysis. In traditional apprenticeship, problems and tasks are assigned based on workplace demands rather than pedagogical concerns, whereas cognitive apprenticeship emphasizes conceptual and factual knowledge, with

tasks and problems chosen to illustrate the power of certain techniques and methods, to give students practice in applying these methods in diverse settings, and to increase the complexity of the tasks slowly, so that component skills and

models can be integrated. In short, tasks are sequenced to reflect the changing demands of learning. (Collins, 2006, p. 49)

In short, cognitive apprenticeship emphasizes generalizing knowledge and its use across contexts, rather than application in the original workplace context. Austin (2009) proposed that cognitive apprenticeship described doctoral programs in education, but in a study of doctoral student supervision in science and engineering, Maher, Gilmore, Feldon, and Davis (2013) found more evidence for the cognitive dimensions of the apprenticeship model than the actual activities associated with apprenticeship.

Instructional scaffolding is defined in the learning sciences as “a process that enables a child or novice to solve a problem, carry out a task, or achieve a goal which would be beyond his unassisted efforts” (Wood, Bruner, & Ross, 1976, p. 90). As in professional education programs, doctoral students engage their subject matter with “progressive independence” (Kennedy, Regehr, Baker, & Lingard, 2005) or “graduated responsibility” (Franzone et al., 2015). Graduate and professional education therefore offer ideal contexts in which to examine the *withdrawal* of scaffolding as much as its provision. Taken together, perhaps part of what makes doctoral education so notoriously challenging is the particular combination of learning expectations placed on students: to increasingly operate in the mode of cognitive complexity that research demands on topics at the edge of current disciplinary boundaries, while reducing reliance on the familiar supports of their professors and peers.¹

Sociocultural support through faculty mentoring

A second distinctive feature of graduate education is the interconnectedness of subject-matter learning (i.e., skills and content) and professional socialization (i.e., identity development and the adoption of professional norms, knowledge, and discourse; Weidman, Twale, & Stein, 2001). Empirical research has documented tensions related to faculty members’ role in doctoral student socialization, however, which have bearing on the persistence and well-being of graduate students from underrepresented backgrounds.

Under the right conditions, faculty mentoring relationships present a durable structure of doctoral education within which the challenge and support functions of student development (Nelson-Laird, Chen, & Kuh, 2008; Sanford, 1968; Holcomb & Nonneman, 2004) are often integrated. Mentoring presents an opportunity to individualize support for scholarship and socialization so that students’ specific needs are met. However, students and faculty may hold conflicting expectations about what constitutes challenge and support—and what the appropriate levels or types should be (Draeger, Del Prado Hill, Hunter, & Mahler, 2013; Draeger, Del Prado Hill, & Mahler, 2015). Reyes,

Slay, and Posselt ([in press](#)) found through case-study research in science, technology, engineering, and mathematics (STEM) doctoral education that when aggressive efforts to recruit students of color were not followed with support for their specific needs, students read their recruitment as one of “bait and switch”—and they struggled to persist. Tensions in professors’ assumptions about rigor and support may help explain such findings (Schnee, [2008](#)). If faculty mentors principally conceptualize their role as providing rigor and if they interpret discourses or practices associated with support or care as softening that standard, students may read imbalance in the scales of challenge and support that research has shown are important to student learning and persistence (Nelson-Laird et al., [2008](#)).

Research using longitudinal qualitative and survey methods has also documented insufficient mentoring as a root cause of two socialization problems in doctoral education: (a) divergence in the norms and activities for which students are trained relative to typical demands placed on faculty (e.g., for grant writing, classroom instruction; Austin, [2002](#); Golde & Dore, [2001](#))² and (b) students’ difficulty with resolving conflicts between personal and academic values (Anderson & Swazey, [1998](#); Austin, [2002](#)). The second problem may be especially fraught for graduate students from backgrounds that are historically underrepresented in the academy, and high-quality mentoring has been found to be critical for African American doctoral students pursuing academic careers. Mentoring introduces perspective and support through which African American scholars can reconcile apparently conflicting values (Antony & Taylor, [2001](#); Gopaul, [2011](#); Margolis & Romero, [1998](#); Taylor & Antony, [2000](#)). Mentors also support African American students’ socialization by acquainting them with professional and field-level norms, while also encouraging them to hold fast to their personal values (Antony, [2002](#)). Research has suggested that these relationships need not be dyadic. Multiple mentors (including faculty, peers, staff, and family) can confer benefits of “developmental networks” (Baker & Lattuca, [2010](#)), such as appreciation for nuances in academic norms and variations in approaches to support.

Psychosocial support: Encouraging a growth mind-set and countering impostorism

Although there is good evidence that faculty mentors scaffold how students learn subject matter and negotiate values as part of the socialization process, we know less about professors’ role in shaping how graduate students see themselves, their abilities, and their futures. This oversight is notable given emerging evidence about educators’ role in facilitating a growth mind-set. Dweck ([2007](#)) found that when faculty hold and encourage in students a view of intelligence as malleable and subject to effort, students are inclined to view intellectual challenges as learning opportunities and to persist through those

challenges. By contrast, when faculty hold and promote the view that intelligence is innate or fixed, students may regard academic work in terms of performance rather than mastery, may become blind to their performance as part of a longer trajectory of learning, and thus may misinterpret underperformance as a matter of innate inability and/or belonging (Dweck, 2000, 2007). Encouraging a growth mind-set thus carries both short- and long-term psychosocial benefits for student engagement.

Cultivating a growth mind-set may also counteract experiences of impostor syndrome. Prompted by insufficient support from significant others and/or social comparisons with one's peers, impostor syndrome is defined as the tendency of some high achievers to feel inadequate despite evidence of repeated success (Clance & Imes, 1978; Lake, 2000; Young, 2011). Students experiencing impostor syndrome attribute their success to hard work or luck (i.e., external factors) rather than belonging or competence (i.e., internal factors). This pattern of attributions comes at significant cost for psychosocial well-being and professional identity development (Cohen, Kay, Youakim, & Balaicuis, 2009; Field, Duffy, & Huggins, 2013). Risks for impostorism appear higher among first-generation, female, and underrepresented-minority doctoral students (Ewing, Richardson, James-Myers, & Russell, 1996; Gardner & Holley, 2011; Gibson-Beverly & Schwartz, 2008). As such, a poorly scaffolded transition to independent scholarship or professional practice may feed the difficulty some students have of gauging the adequacy of their work—and, thus, their self-evaluations as scholars and professionals. For example, in their seminal study of organizational culture in doctoral education, Margolis and Romero (1998) found, “While requiring a new professional identity of their students, graduate programs provide few formal mechanisms to help graduate programs make the transition from being directed students to being self-directed researchers” (p. 7). Impostorism thrives amid ambiguous performance expectations from either one's superiors or broader intellectual milieu.

Synthesis

The preceding review of what distinguishes doctoral education implied that holistic faculty support for graduate students likely has several dimensions. Before explaining the study's research design, it merits reiterating these dimensions: Of course, students need *academic* support for acquiring and advancing subject matter. However, they also stand to benefit from strategies for navigating *sociocultural* rules of the academy to manage the dissonance created when academic and personal values conflict. Third, given the rigor of graduate-level learning and the necessity of developing comfort with the nonlinearity of research and experiences of rejection and failure, *psychosocial* support is needed to cement students' sense of self and belonging in

academia. This inference is consistent with research on the value of a growth mind-set for student development and mastery (Dweck, 2000, 2007). Finally, recent empirical application of the cognitive apprenticeship model in doctoral education (Austin, 2009; Maher et al., 2013) suggested *cognitive* foundations to these other forms of support. In particular, the notion—originally proposed by the CID—of “making thought visible” (Walker, Golde, Jones, Bueschel, & Hutchings, 2008) plays a critical role in that faculty must make explicit the many implicit rules and expectations of scholarly life. As discussed in detail in the Research Design section, I brought these four broad dimensions (i.e., academic, sociocultural, psychosocial, and cognitive) to my analysis of the interview data to understand how students in high-diversity STEM PhD programs experience faculty support.

Research design

The goal of this research was to enunciate the nature of faculty support as experienced by graduate students from underrepresented backgrounds in STEM. The goal of phenomenological research, which motivated my selection of this methodology, is capturing lived experiences of a particular group in relation to a given phenomenon (Husserl, 1931; Luckmann, 1978). Phenomenological data collection techniques center participant voices (e.g., through conversations, interviews, diaries), with analytic techniques intended to reduce data through four stages: (a) bracket preconceptions about the phenomenon at hand to (b) remain intuitively open to the views of participants, (c) systematically analyze and reduce the data by coding or categorizing recurrent themes in participant narratives, and finally (d) describe and define the phenomenon by integrating the researcher’s insights with participants’ own words. I describe these stages in greater detail in the following paragraphs.

Among the approaches to phenomenology that have been advanced since Husserl (1931) introduced phenomenological philosophy, I sought one that would both center participant voices and highlight the intersubjective construction of social phenomena, while recognizing that “support” may not always be received or experienced in the same way that a person means to extend it. Garfinkel’s ethnomethodological approach fit these needs: It analyzes social interactions as social practice, while describing how people create meaning from routine activities “through the competent use of a variety of skills, practices, and assumptions” (Garfinkel, 1967, as cited in Hassard, 1990, p. 97). Apparently mundane exchanges thus receive careful attention, and because the researcher tries to capture “social interaction as an ongoing practice” (Hassard, 1990, p. 99), she is called upon to attend to the socio-organizational contexts of social interactions. In this case, what might be considered by other research standards a narrow social context (i.e., high-diversity STEM PhD programs) was an appropriate site for investigation because it promised a rich

setting for participant meaning making about the specific, intersubjectively constructed phenomenon under analysis (i.e., faculty support) for a particular group (i.e., PhD students from underrepresented backgrounds). In the sections that follow, I outline the details of my sampling, data collection, and data analysis methods, as well as measures taken to enhance the trustworthiness and rigor of the findings.

Sample

Data were derived from four selective STEM PhD programs located at two well-known research universities in two different regions of the United States. The programs were identified as valuable sites to study faculty support for underrepresented students because for the last 3 to 5 years, they have enrolled and graduated significantly higher shares of underrepresented students than their fields overall. To maximize variation, I sampled programs in a combination of applied and pure disciplines at multiple institutions. Within each program, the sample consisted of a total of 29 current or former PhD students, whom the department’s administrative staff and/or chair recommended to me based on their involvement in department-level diversity initiatives. Among qualitative methodologies, phenomenology trends toward a preference for more data about a smaller set of participants. To seek diverse student voices, I maximized variation based on gender and race/ethnicity primarily and other salient identities secondarily (e.g., LGBTQ, first-generation student, veteran status, see Table 1).

With this sample, the findings were likely to be more representative of students drawn and admitted to high-diversity STEM PhD programs than STEM doctoral programs generally or doctoral programs writ large. The findings would also better represent the views of students who are actively engaged in diversity activities compared with those who are not. This distinction mattered insofar as participants’ social consciousness may prime them to emphasize matters relating to power and privilege and/or to interpret their experiences through the lens of their social identities.

Table 1. Key sample characteristics.

	Type of discipline	Higher percentage of women or URM students	Number of students and alumni sampled
Applied Physics	Applied	Both	12
Chemistry	Pure	Women	7
Civil Engineering	Applied	Women	4
Psychology	Psychology	URM	6

Note. URM = Underrepresented Racial Minority.

Data collection

I drew conclusions about the nature of faculty support from analysis of interview and focus-group data collected in two cycles 1 year apart. Phenomenology generally and ethnomethodology specifically strive to center how participants make meaning about their lived experiences of a given phenomenon (Miller & Salkind, 2002). To understand how participants experience and define faculty support, I opted to collect data through conversational semistructured interviews and focus groups (the latter of which were conducted by graduate student research assistants). To ensure ample time for exploration of the matters that were of greatest importance to participants, protocols erred on the side of fewer questions than more, and all questions were phrased to be open-ended. Phenomenologists have argued that closed-ended questions are inherently leading, which compromises the aim of bracketing researcher preconceptions about the phenomenon under study.

In the first round of data collection, which involved both interviews and focus groups, protocols inquired about organizational conditions present in these PhD programs that would help explain their unusually strong outcomes with students from historically excluded groups. Everyday experiences of support emerged as a salient theme in this initial data collection effort, so 1 year later, we conducted 1-hr to 2-hr follow-up interviews with individual students and alumni to examine more deeply these experiences. The second protocol asked students, among other topics, about experiences in which they felt a strong sense of belonging and/or exclusion; people to whom they “turn for support”; examples, behaviors, and attitudes of faculty “who create a supportive environment”; and “the behaviors and attitudes of faculty whom they think of as advocates for the success of underrepresented students.” We also inquired about perceived support for subject-matter learning, as well as about strategies for self-care and coping with stressful experiences.

Data analysis

Four members of the research team (all women; one Black, two Latina, and one White) inductively analyzed the complete corpus of student and alumni interview and focus-group transcripts for forms and sources of support that students identified as salient in managing the rigors of graduate school. This article focuses on student narratives about *faculty* support, which was the only source of support mentioned in 100% of focus groups and interview transcripts.³ I conducted the analysis of these narratives for this article as follows: Initially, I read through the narratives without taking notes to acquaint myself with the full data set. This step was important for phenomenology, in which the analyst actively strives for openness to participant voices before systematic coding begins. Then, I transferred the data to a

new file in NVivo 11.2.2 and engaged in a deep, line-by-line inductive analysis, while reducing the data by focusing on similarities and differences in the accounts students gave and identifying emergent themes in the forms, qualities, and practices students used to describe faculty support. After subjecting the entire data set to the full set of themes that had emerged inductively, I took a step back and considered the list of codes I was using as well as intersections in the data coded to these themes. As a result of that analysis, I disaggregated some codes from one another (e.g., distinguishing reframing struggle from validating student competence), aggregated others (e.g., combining validation of student competence and potential), and renamed some to capture new scope and meanings.

The final stage of phenomenological analysis involves integrating the researcher's insights and participants' voices. Through additional comparative analysis of the material that had been coded within each of the reformed themes, I was able to draw out (a) three defining activities in which faculty members engaged and which students saw as crucial to their well-being and persistence, (b) an underlying theme of psychosocial support that encapsulated those three activities as a core quality of support in the doctoral education context, and (c) several conditions of the faculty–student relationships that students defined as conducive to holistic faculty support. Finally, I juxtaposed the initial conceptual framework with the empirical findings and noted that the activities that students associated with support aligned roughly with the conceptual framework's four dimensions of support (cognitive, academic, socio-cultural, and psychosocial).

Trustworthiness and rigor

I sought trustworthy, rigorous research through established strategies that included: multiple forms of data, diverse participants and diverse interviewers, data collection at multiple time points, transparency about my analytic process, and intercoder reliability checks during the data analysis process. The last of these was especially important in keeping to a phenomenological approach, which aims—albeit almost always imperfectly—to bracket researcher perspectives and elevate participant understandings and experiences. Also with this interest in mind, I had member-checking conversations with each program chair to discuss themes that had emerged as salient in the first round of data collection. Although these conversations did not change the primary findings I present, they guided protocol development for the second round of data collection and refined my understanding of support within the individual PhD programs.

Findings

The findings that follow outline PhD student experiences with support in high-diversity chemistry, physics, civil engineering, and psychology departments. Although students discussed the importance of access to academic support, they did not see faculty as a primary source of support. Rather, in the face of academic and other struggles, students described professors playing a critical role in providing psychosocial support. The most common expressions of this support centered on shifting student perspectives about the difficulties of graduate school. Supportive professors normalized the struggles students faced by facilitating a growth mind-set, validating competence, and creating space to discuss racialized and gendered aspects of academic life. After discussing these themes, I present evidence about the conditions that made this support possible.

Faculty as a last resort for academic support

Phenomenology calls upon researchers to bracket their own assumptions to the greatest extent possible, and in this case, it proved a useful exercise. Although one might expect academic support to be critical to students and although respondents frequently pointed to the “training” faculty provided, in reality, students also admitted to rarely seeking and faculty rarely extending individualized academic support. Pat’s description of her chemistry professor was one of the only such examples:

He puts a lot of effort in the students, and he could see that I was kind of struggling with something and he was like, ‘Just come see me every morning and we’ll spend half hour to an hour just talking about this and we’ll figure it out.’ He was also very compassionate in that ... It is really great to have faculty like that who can kind of connect with you on an emotional level but still also know that they need to push you. And I’ve run into a number of the faculty that are like that in the program, so I feel really encouraged by that.

The more common pattern in the data was for students to describe professors as a last resort for academic support, and they turned to faculty only after depleting options among peers, lab mates, and postdoctoral fellows. Among those who discussed hesitance to approach faculty, they traced it to uncertainty about how to appropriately do so and/or worries about possible repercussions. Emi, in psychology, explained:

My first years were very rough for a lot of different reasons, and one of them was I didn’t—you know, this impostor syndrome. I didn’t know how to ask for help. And so I remember my mentor as intimidating, not because he was not friendly or helpful; I was just scared.

Others worried that admitting their need for academic support to professors would compromise their standing, because, “If a student isn’t necessarily performing, then they (faculty) really have no vested interest in that student.” Social comparison with their peers was endemic, and fear of being “viewed differently,” relative to previous performance or their peers, deterred some of the very students who needed academic support from seeking it.

Expressions of psychosocial support

More commonly than providing direct academic support, faculty provided support by reframing students’ narratives for reasons they *needed* academic support. Specifically, when we asked student participants about support from faculty, more than half described professors offering alternative interpretations of how students saw challenging situations at hand or themselves. By reframing situational struggles with academic work, validating personal qualities required to do the work, and “keeping it real” about the ongoing challenges of race and gender in the academy, faculty helped ensure that students would not misconstrue experiences of impostorism or isolation with their ability to manage the rigors of graduate school.

Reframing situational struggles to reduce anxieties

Few students may have been comfortable approaching professors with academic or research questions; however, when confronted with evidence that seemed to corroborate doubts about their belonging or ability to persist, faculty mentors’ reframing the difficulty of the work or specific situations could change narratives about belonging that replayed in students’ heads. Both official advisors and other faculty members played this role. I quote at length Ana, a student who was on the cusp of completing her PhD in psychology when I interviewed her. She recalled a critical meeting with her advisor that shifted her mind-set and, with it, her trajectory:

I had already failed two classes that everyone else passes, and I was on academic probation because my GPA (grade point average) was so low and my fellowships were about to be taken away because I was doing so bad ... I thought, ‘What am I doing here? I should have listened to my GRE scores.’ That’s what my mind-set was set on ... And so I came to my advisor and I was just kind of brutally honest with him, just like, ‘Listen, I don’t know if I’m capable of going any further ... I think I’m going to be kicked out. I mean, I’ve read the handbook. The coordinator has talked to me about this ... You guys finally found out [laughing] how dumb I am.’ And he was just not concerned at all ... He was just like, ‘That’s not going to happen. Stop focusing on—you can’t do anything about failing your class. You can’t go back and change it because it is there. So now let’s focus on what you need to do to continue.’ I think that mind-set just blew my mind ... He believed in the fact that I *could* continue and nothing was going to happen, that it is OK, and let’s just focus on how to fix this. And not, ‘What is going to be the repercussions

of all the mistakes you made?’ It didn’t relieve my anxiety, but yeah, I felt really supported at that point.

Given nagging worries about her ability (“I should have listened to my GRE scores”) and the assumption that her performance and department policy left no room for second chances, Ana’s advisor shifted the focus to “what you need to do to continue” and “how to fix this,” while offering reassurance that “nothing was going to happen, that it is OK.” In what could have been a moment of crisis, this shift enabled her to move forward. In chemistry, Gina’s advisor similarly provided reassurance that she would be shielded from the most serious repercussions of struggling in graduate school:

I think when I’ve felt a lot of support in the department was actually, the one most recently was a few days ago. I had like a mild freak-out [*laughs*] in front of my advisor. And then I e-mailed him about it and just word-vomited on him and he took that very well. And was basically like, ‘I’m glad you’re getting help. It’s OK. You’re doing fine. Everything is OK. Let’s talk about your project’ ... I felt very supported, like he’s not going to kick me out.

In several cases where students described professors reframing situational struggles, professors’ ability to put present or short-term performance into a longer-term context was critical. One student who had “a rough experience with one of my exams” discussed how a supportive professor “looks at a student’s whole life better than just the performance in a single class or a single grade. It is very relieving to have that sort of support.” And in another department, a returning veteran received encouragement about his long-term prospects, despite immediate concerns:

I remember talking to him about coming—you know, not having the same background, having been out of school [for] a while and that I was struggling a little bit. And he was like, ‘Don’t worry. Once you get it together, you’re going to be great.’ He would always tell me things like that, like, ‘Don’t sweat it.’

Similarly, a civil engineering professor, Frank, reassured his student, Maria, that her underperformance in one of his classes was not an indictment of her effort or future. He acknowledged, “I know you’re trying. It is OK.” In this case, Maria felt “horrible” about underperformance because Frank “cares more about student learning than almost any professor I’ve seen.” In learning environments that place a high premium on performance, it may prevent students from unhealthy rumination or anxiety to hear professors acknowledge the work’s difficulty, reasons for struggle other than students’ own ability, and/or simply to affirm learning as a process. Consistent with Dweck’s (2007) research on the value of a growth mind-set, I found that in the face of significant struggle, students were provided with a path forward when professors placed performance in the context of a learning process,

when they heard from respected authorities that second chances are available, and when they were redirected back to their work.

Disrupting self-doubts with personal validation

Student narratives also included experiences of professors disrupting self-doubts by validating that they personally possessed key scholarly qualities (e.g., competence, potential, qualifications). Acts of reframing struggle are distinctive from acts of personal validation, in that the former emphasizes external matters—the work and its inherent difficulty—whereas personal validation focuses on qualities in and of students. Both involve shifting mind-sets, but whereas reframing struggle changed how students saw the work and the path before them, validation reframed students' sense of themselves as doers of the work and members of the academic community (Rendon, 1994).

Delia, in civil engineering, noted that her advisor, also a woman, strove to help her see her worth by countering the assumption that she had been admitted “by accident.” Delia reconstructed a conversation in which her advisor explained the elaborate admissions process:

‘Your application passed every one of those hurdles.’ And I remember thinking, ‘Jesus, if I’d known that’s what it was, I wouldn’t have even applied. I’m glad I was so dumb when I applied.’ Again, it is that mentoring that she wanted me to feel powerful ... She wanted me to know that I didn’t get in by accident ... that, ‘We did what we could for the first part, but the rest was all you.’

Later in our interview, she mentioned this conversation again, noting that her advisor’s efforts to “make me feel powerful” helped her believe that “I would take myself the rest of the way.” Jenny, in chemistry, similarly commented, “My advisor is very interested in empowering female scientists, which I really appreciate.”

Two students in psychology mentioned times that professors validated their preparation and expertise. Leah recalled the guidance that Anita gave to her: “‘It sounds like you are underselling yourself because you feel you are not ready, but you are more qualified than you think you are if the two places you applied both gave you interviews.’” Leah admitted how rarely she had thought of herself as qualified and how rarely she had received that kind of encouragement. She said, “‘You’re taught to just like look at the places where you need to improve.’” Validation from Anita was especially meaningful for Leah because they had very similar personal trajectories, a theme that I will discuss in greater detail. Similarly, a Black male student talked about the support and validation of a Latina professor and the difference it made to his sense of belonging: “Those feelings of not belonging or not knowing enough were my biggest thing: I don’t know enough. I haven’t read enough. Just by sitting and talking with her and her encouraging me to walk in my expertise a little bit more, that was really beneficial.”

More than simple encouragement, the two forms of faculty mind-set work that students described—reframing struggles and disrupting self-doubt through validation—involved proposing alternative interpretations about the difficulty of graduate school, what to do about it, and/or what it meant for their futures. This activity also involves emotional labor on professors' part. Professors' responses to moments of honesty about students' self-doubts could guide students toward a more adaptive emotional state and/or mind-set and could help them see the situation or themselves differently.

'Keeping it real' about race and gender in the academy

In the third major theme, which corresponded to a sociocultural dimension of support, students spontaneously discussed how professors addressed race and gender dynamics in the academy. When we asked participants an open-ended question about the behaviors and attitudes of faculty whom they saw as supporting their academic success, the most frequent type of response centered on faculty engagement with social identity-related struggles. This density in the data highlights both the salience of social identity to the students' experience and the importance of support that takes this form.

As in previous research (Davidson & Foster-Johnson, 2001; Thomas, Willis, & Davis, 2007), same-race and same-gender faculty played a crucial role for students in this sample. One in six described turning to same-gender faculty for how to handle sexual harassment, and one in seven discussed turning to same-race or same-ethnicity faculty to discuss racial discrimination. More frequently, and in all four programs, students talked about how same-identity faculty strengthened them to face everyday isolation and microaggressions. A Black student in psychology described the help he had needed from his mentor:

'I don't need you to be my parent, but just kind of see me' ... I needed mentors, so I can be like, 'I don't understand what's going on here. I'm feeling isolated.' When I first got here, I went to my mentor and was like, 'White people are crazy, and I don't understand [laughs]. I don't understand what's happening in this interaction and I need some help.'

A woman of color in civil engineering with an exceptionally difficult personal background described how meaningful it had been to know that her female professors had also "overcome a lot" and nevertheless had become tenure-track professors at a top university. "I was able to communicate with them because I was also very open about my background and some of the things I'd gone through." Yvette, in psychology, explained,

We had a lot of very frank conversations about what it was like for her as a woman of color ... Having open conversation about it is imperative. It is one of those things where I suspect that it is happening, but hearing about it and then hearing how she is coping and what she is doing to fight for herself really helps.

Similarly, in physics, a woman described learning to see her situation through the perspective of female mentors:

I look at this more from the perspective of women in the sciences. I found that [the] ones who are advocates, first off, they are strong people to begin with. They have this sort of attitude that things don't really faze them anymore. They've gone through many struggles, so they seem like, 'This is just another challenge. Let's take care of it.'

Frankness about race and gender and projecting a can-do attitude seemed to be critical to the support faculty provided.

Ten students (approximately one third of the sample) also shared without prompting their appreciation for White faculty members who (a) openly discussed and demonstrated effort to learn about issues of race that often lie just beneath the surface of academic life, and/or (b) demonstrated investment in students' futures. With respect to initiating a conversation about race, a Black male student explained,

This might sound basic, but the willingness to talk about these issues and to create a space for these issues to be talked about—particularly in my experience from the *not* underrepresented faculty. When *they* created a space to talk about it, it is like, 'Well, you don't have to talk about this because you don't necessarily live this. So for you to recognize that this is an issue for me was particularly powerful.'

In applied physics, Gina shared a similar view of her advisor:

He said, 'I want to be this type of advisor. What can I do to support you?' And you see him kind of on other different Facebook groups about equity and justice and like in the physical sciences and whatnot. And you see it back and forth, even when he missteps or whatnot in particular areas, where he is not necessarily familiar with or comfortable in terms of being an ally—being able to say, 'Oops my bad, what can I learn? What do you have to say? Teach me. I won't necessarily talk over you.' Those types of things.

Eight participants also described ways that White faculty demonstrated investment in students' futures: Four did so by creating student publication opportunities, four provided exceptional support with navigating the job market, and one nominated a student for a dissertation award. One particular White female professor came up frequently in psychology students' comments. "Her program of research and her interactions make her a safe individual," one student said, and so she was often sought out by advisees having difficulties with their advisors. At least two students in our sample transferred to her lab after sexual harassment from their first advisor, and she quickly made clear to them through her actions that "she feels invested" in their futures. A third student of color spoke about how this professor supported students in the job market:

She teaches a professional development course. We have entire days dedicated to: How do you go on the job market as a diverse person? What's your teaching statement look like? How do you sell your research and pitch yourself? How do you dress for an interview? All those things that are coded and stereotyped, we talk about really directly.

In addition to guidance on “those kind of things that are coded and stereotyped,” she noticed “my milestones” and acknowledged them in concrete ways, such as with a quick e-mail on the eve of a major talk or with snacks and flowers from the grocery store to celebrate when a member of the lab won a fellowship. “It just takes 5 s or 5 min, but makes a difference—that thoughtfulness.” Such acknowledgements could be interpreted as simple kindness, but noticing and celebrating successes can also be read as forms of validation—a central form of support that students perceived.

Relational conditions that facilitated supportive faculty–student relationships

The final set of findings identified several relational conditions associated with the forms of support that have been described. As I will describe, faculty members' visibility and responsiveness cued students into these professors' openness to engagement. Once engaged, professors downplaying the faculty–student status gradient and cultivating trust fostered greater honesty and vulnerability—on the part of students.

Visibility and responsiveness

Students relayed comments from faculty that resonated in their minds months or years later and pointed to the importance of candid conversations with faculty as a setting in which students read support. Professors' visibility and responsiveness made such conversation possible. Two students brought up the courtesy of prompt e-mail replies as something that they did not take for granted due to patterns of unresponsiveness from others in their departments. Robert, who disclosed feeling isolated and lonely, said one faculty member stood out merely because, “She is around.” And in physics, Theresa spoke glowingly of her primary mentor, Niles, a senior professor of color. To manage a part-time administrative appointment, Niles delegated some mentoring responsibility to postdoctoral fellows and senior graduate students, but he continued to play an important role in Theresa's development. She explained,

He has the power and the position and the *willingness* to go to bat for students. I think that is one of the most important things about, I guess, for me, mentoring. And I guess in terms of an advocate as well. He's definitely been around and I know is busy, but he does make time for students. I've been able to talk to him

about a lot of the issues I've had with my advisor and kind of figuring out ways in which to navigate.

In academia, where time is among the most precious commodities, it would be understandable that students in all four programs would associate with support a professor's willingness to spend time talking in person. Similarly, Li, a student in civil engineering, defined support as,

... feeling welcome at office hours or being able to talk to professors when I needed to. I think that was support enough, but again I come from a background where there is no contact whatsoever between the professor and the students, so I might be biased.

And, laughingly, a student in chemistry commented, "I've had the good opportunity and good fortune to have several professors spend time talking at me—or with me." Thus, beyond coming across as "approachable," the data made clear that support from professors was embodied in their physical presence, as conventional wisdom would suggest, and was communicated through the time and responsiveness they extended.

Faculty downplayed their status to cultivate trusting relationships

Students from chemistry and applied physics also discussed appreciation for faculty who minimized the usual faculty–student status hierarchy. After describing a beloved physics professor, Arthur, as "this sweet, teddy bear of an old man," Amanda compared his self-deprecating sense of humor to his colleagues' posturing:

Other professors, you meet them and they're so smart and they have these giant, 'I'm a physics professor at the University of Such and Such'-sized egos. We had one professor who said on the 1st day or 2 of class, 'If you stay, you will be physicists.' And he really did his best to kick your ass. Arthur, on the other hand, was hard, and his class was really difficult, but he always joked that there would be no dissatisfied customers. If you did poorly on an exam, you could go and talk to him.

In another case, James, an African American male student in psychology, described a mentor with whom he had frequent communication as offering "a different level of keep-it-real kind of support" than was the norm among the department's busy faculty. Perhaps because a gulf of status and ego often separates struggling graduate students from the scholars tasked with advising, students and alumni both highlighted the value of "authenticity" and "trust" in faculty–student relationships.

Cutting across the conditions that facilitate supportive faculty–student relationships—visibility, responsiveness, downplaying status, and cultivating trust—was effort on the part of faculty to humanize the mentoring relationship and engage on common ground. This common-sense goal that required social skill and as much emotional intelligence as scholarly brainpower. It was

perceptual work that entailed emotional labor and impression management—monitoring what one does and says to reduce the perception of high stakes and ensure that the relationship facilitates growth rather than stands in its way.

Discussion and implications

A classic definition of student development is the “organization of increasing complexity” (Sanford, 1967, p. 47). Graduate school is an ideal context in which to study students’ development because they are expected to engage with increasing independence in tasks requiring analysis and synthesis on the edge of their current abilities and their field’s current scope of knowledge. In addition to this cognitive complexity (Braxton & Nordvall, 1996), the socialization process occurring in doctoral programs adds a layer of psychosocial complexity, especially for women and students of color. This complexity may include negotiation of one’s sense of belonging and potential in an environment where they feel isolation and/or impostorism. Amid such environmental threats, experiences of academic struggle may easily be interpreted as evidence confirming self-doubts and/or negative group stereotypes (e.g., Steele, 1997; Steele & Aronson, 2005). The presence of specific, known psychosocial threats means that we must not be dismissive of psychosocial support as a form of support that students may need to thrive.

Indeed, I found that many of the female students and Black, Latino, and Native American students in this sample held self-doubts consistent with the impostor syndrome. The existence of this syndrome—combined with graduate school’s intellectual rigor, students’ direct experiences with sexism and racism (ranging from frequent subtle slights to outright harassment), and other environmental threats (including isolation and perceived competition)—called into question their belonging and ability to succeed. Scholarly socialization and support thus require normalizing struggle by acknowledging the difficulty of the work, validating students’ inherent potential, and managing how experiences with racism and sexism may play into student self-doubts.

These specific faculty behaviors align with previous theory and research about effective faculty–student relationships. Professors reframed academic struggle in accordance with encouragement of a growth mind-set (Dweck, 2007). Their mentoring created space to discuss the raced and gendered nuances of academia (Antony, 2002; Taylor & Antony, 2000). And consistent with validation theory, faculty made efforts to affirm students’ competence and potential (Rendon, 1994). These theoretically supported and evidence-based practices each embody the otherwise-abstract notion of “support” for students’ persistence and well-being. I also identified four specific faculty behaviors that established relational conditions conducive to psychosocial support: visibility, responsiveness, downplaying status, and cultivating trust.

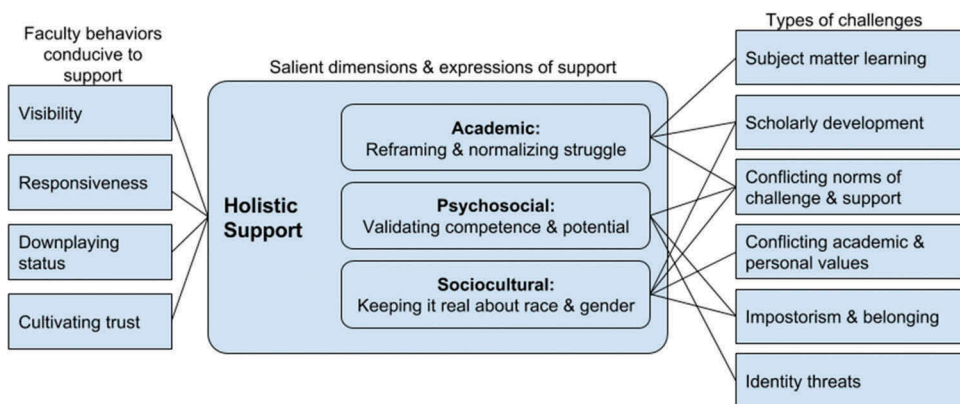


Figure 2. Holistic faculty support in doctoral education.

By integrating the empirical findings with major themes uncovered in the literature review, [Figure 2](#) offers a framework for understanding holistic support in doctoral education and the distinctive challenges of graduate education that such support may empower students to face.

Implications for research

These findings carry implications for future research and for how faculty individually interact with students and collectively organize graduate programs. Strong, consistent evidence of impostor syndrome in this sample suggests an opportunity for scholars of diversity in STEM graduate education to explore this topic more directly and perhaps to test the efficacy of formal strategies to counter it. Social psychological experiments with affirmation exercises, for example, have yielded surprisingly strong and positive results reducing stereotype threat and may similarly help correct the types of self-doubt portrayed in this study (for two such experiments, see Walton, Logel, Peach, Spencer, & Zanna, [2015](#)).

Research should examine how peers and others may also express the dimensions of support depicted in [Figure 2](#) and how their support complements or augments what they receive from faculty. Scholars could compare the sources and forms of support that students articulate receiving from faculty and peers and could conceptualize them in relation to the synergistic benefits of doctoral students' developmental networks, as proposed by Baker and Lattuca ([2010](#)). Especially in STEM, where work often occurs in the context of a lab or large research group, this avenue of research could illuminate the multifaceted nature of learning in PhD programs. Findings in this study emerged from analyses in STEM disciplines (where doctoral work takes place largely in lab settings and

dissertations frequently serve the interests of faculty members' grant-funded research) and with a sample of mostly women and people of color (who encounter specific psychosocial barriers due to their lower representation). Replication in other disciplinary cultures and/or with other subpopulations could highlight convergence and divergence in the need for support that doctoral students experience.

Finally, education scholars should examine other contexts in which psychosocial support promotes student success and how they relate to subject matter learning. For decades, researchers have tended to conceptualize professional socialization, cognitive development, and subject-matter learning as discrete processes; however, I found interconnections among them that deserve closer analysis and perhaps the development of a more integrated model of graduate student development.

Implications for faculty practice

Supervision

With respect to implications for faculty practice, students' reluctance to turn to faculty for support with their academic work fit the cultural expectation that doctoral students work with increasing independence from their advisors (Gardner, 2008). Indeed, participants in this study were all 3 or more years into their doctoral education, which may help explain this finding. However, if faculty members are unaware of academic challenges or other situations that threaten a student's progress until the student reaches a point of crisis, faculty members may be forced to make difficult decisions about continuation or create exceptions to policies to retain students. Establishing additional information channels, regular and low-stakes opportunities for student review, discussion among faculty who serve PhD students, and/or systems for closer supervision are straightforward practices that merit consideration.

Growth mind-set

The prevalence in the data of students recalling key conversations with professors highlights the long-lasting influence of feedback from faculty that enables students to properly interpret their most challenging situations. Professors should therefore cultivate a growth mind-set in students (and themselves), while recognizing that their own framing of reasons for success and failure matters for students' well-being and how they see their belonging and futures. I found that faculty members whom students viewed to be responsive and less concerned with faculty-student hierarchies were more likely to be viewed as trustworthy sources of support.

Interpersonal skills and cultural competency

As the graduate student population diversifies, students need professors with not only technical expertise, but also the interpersonal skills and cultural competency to offer psychosocial guidance. The findings corroborate Harper's argument for "racial literacy" as a core competency of faculty from all backgrounds (Flaherty, 2016). Students are typically socialized to regard academia as an open opportunity structure in which honors and rewards are allocated through meritorious performance in intellectually rigorous work. Doctoral programs do not generally communicate through official channels the nuances of how race and gender operate within academia or how to cope with stigmatizing behavior when it occurs. The absence of open conversation about these matters leaves students with little recourse for meaning making when they encounter experiences that lead them to question the system's neutrality. In the absence of better information, fleeting doubts about one's future or belonging may take root in self-scripts that undermine even the most talented students' performance. For emerging scholars, then, open and honest conversation about the otherwise-coded aspects of academia is critical scaffolding and an important dimension of holistic support.

Rethinking cultural norms and practices

In the longer term, the findings suggest that faculty from all backgrounds should complement direct support for students from underrepresented backgrounds with calling out the stigmatizing behavior, double standards, and policies and practices that institutionalize racial and gender inequalities. Alongside informal or formal supports, such as workshops for women and students of color on the job market, we also need long-term efforts to rethink and reform the structures and norms that have created the need for such workshops. The findings also carry implications for how faculty select graduate students. The pervasiveness of impostor syndrome in these graduate programs suggests an additional argument for systematically considering socioemotional/noncognitive admissions criteria (e.g., conscientiousness, resilience, availability of strong social support, and ability to navigate a complex system; Sedlacek, 2004) within holistic admissions. If what makes graduate school a struggle is a combination of its cognitive and psychosocial demands and if we need to normalize this struggle, then we should select students for both their cognitive/academic and noncognitive/psychosocial strengths.

Conclusion: Normalizing the struggle

In closing, previous research has examined how faculty mentoring plays into the divergence many rising scholars encounter between the activities of graduate school and those that they are expected to fulfill in the job market (i.e., a skill divergence), as well as how it plays into the tension between one's personal

values and those of the academy (i.e., axiological divergence). This study contributes to the literature by highlighting how faculty support can bridge divergence in the unspoken assumptions that many students hold about why graduate school is so hard on the one hand (e.g., “I should have listened to my GRE scores”) and what it means for students’ professional futures, on the other hand. When professors normalize the struggles inherent to graduate school and academia, they promote more equitable learning outcomes in potentially fraught environments. Students gain the perspective to place their present performance in a longer-term context, walk in their growing expertise, and recognize that signs of racism and sexism, although endemic, need not hold them back.

Notes

1. One could choose to critically analyze these expectations themselves as foundations of inequity in the academy, considering, for example, how they may intersect problematically with cultural values of communities that are underrepresented in the academy; however, such critique is beyond the scope of this article. Rather than calling into question the culturally embedded expectations on doctoral students, this analysis aimed to plot faculty behaviors that enable students to persist under their weight.
2. An emerging literature has highlighted divergence in the norms and activities for which doctoral students are trained and the full range of careers that PhDs eventually assume (see, e.g., Cassuto, 2015).
3. Other sources of support mentioned included: peers (mentioned at least once in 93% of focus groups /interviews); department structures or informal practices (71%); institutional structures such as fellowships, career center, and writing center (64%); family (50%); and administrators (including office staff, department chair, and ombudsperson; 43%).

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