



IDENTIFYING AND LEVERAGING COMMUNITY CULTURAL WEALTH IN PHYSICS BRIDGE PROGRAMS



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INTRODUCTION

In an effort to increase doctoral degree attainment among racially minoritized students in physics, some departments have implemented programs designed to support students who were not admitted directly into doctoral programs—or who believed they would not be admitted if they applied. Often called bridge programs, they vary in structure, but typically strive to provide mentoring and academic preparation, create supportive environments, and facilitate community.

While these programs offer an opportunity for racially minoritized students in physics to transition into physics graduate programs, students still face challenges in these programs. These students are often able to overcome challenges in their educational experiences before and during graduate school by using various forms of cultural capital. However, the forms of cultural capital utilized by racially minoritized students are often overlooked and unacknowledged in academia. To address this, Yosso's conceptualization of community cultural wealth challenges the traditional ideas of cultural capital by highlighting and valuing the types of cultural capital that exist within Communities of Color. This research-based guide is intended to help students in bridge programs recognize and become empowered by the cultural wealth they already possess.

ABOUT THE STUDY

The recommendations for students in this guide were developed from the findings of an IGEN Research Hub project led by Geraldine Cochran at the Ohio State University. Cochran's team conducted semi-structured interviews with 8 students in American Physical Society Bridge programs at 4 institutions. These students self-identified as Black, African American, Hispanic, Latino, Chicano, and Xicano Rican born in Texas. The student-centered focus of this guide is based on their recommendations.



WHAT IS CULTURAL CAPITAL?

Pierre Bourdieu's original theory of cultural capital refers to the knowledge, skills, behaviors, and credentials that people pick up through their upbringing or gain in academic and professional settings. It is called 'capital' because institutions use these resources to allocate opportunities. The theory helps explain the reproduction of social and educational inequalities; those who are considered part of dominant groups in society have been socialized to forms of cultural capital that align with what elite institutions are looking for and reward. However, all cultures come with resources that people leverage to access opportunities; we are shining a light on less-frequently recognized forms.

FAMILIAL CAPITAL



DEFINITION

Familial capital “refers to those cultural knowledges nurtured among familia (kin) that carry a sense of community history, memory and cultural intuition” (Yosso, 2005, p. 79).



STUDENT VOICE

“The boss at the previous job that I had at that time... He [the boss] comes from a very similar background that I come from, migrant farm worker family. So, I related to him on those wavelengths. He was providing different resources of how to move. Asking me questions about the move like, ‘Hey have you thought about... the shampoo?’ ... He really helped me prepare by asking me those questions and making me think about things that I hadn’t thought about before. My parents were also a really big support.”



RECOMMENDATIONS

Recognize that your familial capital may come from people who are not “family” members. **Maintaining your relationships with kin** can support you through graduate school.



SOCIAL CAPITAL



DEFINITION

Social capital “can be understood as networks of people and community resources. These peer and other social contacts can provide both instrumental and emotional support to navigate through society’s institutions” (Yosso, 2005, p. 79).



STUDENT VOICE

“Even just the process of learning how to study well was a challenge for me... I think the biggest help for me was learning that I needed people... Because the most helpful ways that I would learn was by asking questions to people, whether it be professors or from other people in my class who I was able to study with and try to work on homework problems with and talk through the concepts –rather than just beat my head against the wall for hours not knowing what the next step was.”



RECOMMENDATIONS

Continue to **be intentional in your efforts to create a support system** that includes fellow graduate students and faculty within and outside of your department.

ASPIRATIONAL CAPITAL



DEFINITION

Aspirational capital is “the ability to maintain hopes and dreams for the future, even in the face of real and perceived barriers” (Yosso, 2005, p. 77).



STUDENT VOICE

“I was taking calculus and physics courses and I thought I wanted to be an engineer, but I knew that to get into an engineering program was very competitive and my grades weren’t that great. So it was pretty naïve of me then, but I was like, well I like to learn about this stuff... my grades aren’t good but at least I have solace in the fact that I’m learning the material, and I wanna... learn it, and learn why... so that’s when I kind of focused on that I kind of wanted to do physics.”



RECOMMENDATIONS

When faced with challenges, **remembering your love of physics or desire to learn physics** can be a motivation that helps you to get passed the challenges.

RESISTANT CAPITAL



DEFINITION

Resistant capital refers to “those knowledges and skills fostered through oppositional behavior that challenges inequality... This form of cultural wealth is grounded in the legacy of resistance to subordination exhibited by Communities of Color” (Yosso, 2005, p. 80).



STUDENT VOICE

“At one point they [Congress] were going to tax the tuition waivers... and me and... another bridge program student were like, ‘this ain’t right, this is busted’... So we organized a rally and like a call center, and like a whole set of information ... about what was going on... We were also able to connect to the... activist students, and they vibed to what we were doing. And we reached into their resources into their communities. So by the end of this rally... we had one of the state representatives show up... So, when it comes to how much control do I have, I have a lot of control to apply to the resources and put myself in situations where I could have access to resources.”



RECOMMENDATIONS

Recognize your power to resist people, policy, and practices that serve as barriers or contribute to inequities. **Your ability to connect to community, access resources, and organize are forms of resistance** that can sustain you through challenges.

NAVIGATIONAL CAPITAL



DEFINITION

Navigational capital "refers to skills of maneuvering through social institutions. Historically, this infers the ability to maneuver through institutions not created with Communities of Color in mind" (Yosso, 2005, p. 80).



STUDENT VOICE

"The score on the qualifying exam is only part of what's taken into consideration when they decide whether or not you can proceed to the PhD program, and the other parts that are involved are research experience and coursework. I had to sort of weigh the options of 'should I continue doing research with my previous advisor through the summer before the qualifying exam so that he can sort of pull for me if the qualifying exam itself didn't turn out so well?' Or if I should get this little bit of research experience with this new advisor? Ultimately I decided to switch... I think it was a really good decision because the research that I ended up doing over the summer went well, and I was really enjoying it... with this advisor."



RECOMMENDATIONS

As you progress through the milestones of your graduate program, you may face difficult decisions or have to work around challenging policies. **Utilize the skills you developed navigating challenging practices and policies in the past.**

LINGUISTIC CAPITAL



DEFINITION

Linguistic capital “includes the intellectual and social skills attained through communication experiences in more than one language and/or style” (Yosso, 2005, p. 78).



STUDENT VOICE

“I mean the academic language... It’s not my language. My language is very street, from the hood, and not only that but the language that we speak out here [hometown] is constant code switching where I don’t really know where I’m switching that language. And even though it’s not Spanglish the other language I speak is hip hop... I was able then to make my own music which I then laced with a little bit of physics, because again, I do speak physics.”



RECOMMENDATIONS

Be proud of your ability to speak multiple languages, including the vernacular of your community, the language of the academy, and any other languages you speak. Your ability to incorporate multiple languages into your daily practices is a strength, even if it is not a skill recognized in dominant settings.

SUGGESTED READING

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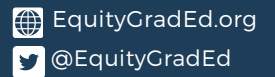
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AUTHOR BIOS

Dr. Geraldine L. Cochran is an Associate Professor in the Department of Physics at The Ohio State University specializing in equity-oriented physics education research. Cochran is passionate about teaching physics and supporting efforts to broaden participation in STEM fields by identifying and mitigating the negative impact of inequities in physics and modifying practices and policies to eliminate inequities in physics. Cochran is a member of the Inclusive Graduate Education Network and the Inclusive Graduate Programs Project, a fellow of the American Physical Society, and a fellow of the American Association of Physics Teachers.

Stella Nelson is a senior undergraduate student in the Department of Physics at The Ohio State University. Nelson is dedicated to enhancing outreach initiatives within the field of physics and intends to further her efforts to positively influence public perception of the discipline.

Sabrina Henige is a sophomore undergraduate student in the Department of Physics at The Ohio State University. Henige is involved in the Access Network, a network of universities working to create a more inclusive environment in physics using Physics Education Research principles. Henige hopes that her contributions to multiple networks of diversity, equity, and inclusion will make a positive impact within her education community and beyond.



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