Improving the Culture of STEM Degree Attainment with Co-Curricular Supports

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Science Posse Scholars Program

- Created by Irv Epstein (Brandeis University) and Deborah Bial (Posse Foundation)
- Cohort model of ten students per year
- Students selected for their communications skills, problem solving skills, interpersonal skills, and strong interest in majoring in science
- Four-year, full-tuition scholarship

Posse Scholars vs. All Other Students at Brandeis

	Posse	Other Brandeis
Underrepresented Racial Minorities	72.5%	9.7%
First Generation College Student	72.7%	20.0%
Pell Grant Recipients	80.0%	20.9%
Average Math SAT	614	713
Average AP Score Reported	2.38	3.27
Major in STEM	70.0%	17.8%

Findings for All Other Students: Retention in STEM

	All Students	Whites and Asian-Americans	Underrepresented Racial Minorities	Race/Ethnicity Unknown
Sex-Female	Negative Gap	Negative Gap	Neutral	Negative Gap
First-Generation	Neutral	Neutral	Negative Gap	Neutral
Pell Grant	Neutral	Neutral	Negative Gap	Neutral
Income	Tipping Point	Tipping Point	Positive Gap	Tipping Point
Assets	Tipping Point	Tipping Point	Positive Gap	Tipping Point

Science Posse Program Components

- Pre-Collegiate Training (10 months)
- Summer Science Immersion Program (10 days)
- Weekly group meetings (freshman and sophomore year of college)
- Posse Mentor leads the weekly group meetings and meets individually with each Scholar every other week (freshman and sophomore year of college)
- No science remediation, experience in a research lab is optional

Study Design

- Interviews with well-resourced, underrepresented students, and Science Posse Scholars
- Science Survey to understand differences in beliefs of students
- Analysis of student records data to determine key factors in STEM retention

Science Survey: All Other Students vs. Science Posse Scholars

The Pull Factor

- I worry that I am not academically as strong as other students, 3.55 versus 4.16 ($p<.001$).
- Science in college is harder than science in high school, 4.33 versus 4.84 ($p<.001$).
- Science is my true academic strength, 3.37 versus 3.13 ($p<.05$).
- I feel more confident in other subjects than in science, 3.00 versus 3.39 ($p<.05$).
- Doing well in science comes easily to me, 2.87 versus 2.10 ($p<.05$).
- I am a stronger students in the sciences than my peers, 2.69 versus 1.87 ($p<.001$).

Science at Brandeis

- **Kirby:** I guess it kind of came up…. just coming into campus how different it is for you or how your parents trained you into being ready for the sciences in general. I was having a conversation with students and other friends and just seeing [their] status on Facebook. Some of my friends, their parents are PI'S or something in the scientific community. Their parenting, I don't want to say it's not the same, but it's different. Don't get me wrong, I don't blame my parents at all for what they put me through. I think they did the best they can. At the same time they can only do so much.

- **Zara:** Not to be narrow minded, but in seeing all the people that are in chemistry, or in the sciences, it's mainly Asians and Caucasians and Indians. And there's not that many Latinas there. There's not many Hispanics there. There's not many people from urban cities that are there. So, it's definitely hard, especially when you're talking to your friends, and they're like, "Yeah, my mom used to make me study all night long." And I'm like, "Well, my mom used to make me clean the house all the time. That's what my mom cared about most, you know?" My mom used to make me do chores, and like it's – it's hard.

- **Tasha:** It was a struggle…I remember I got here, and I was like, "Oh, this is nothing. I did all these classes before"… The first day we had an exam. I thought [the instructor] was lying…So, I looked at the exam. I looked at everyone else around me. And I couldn't find anyone as troubled as scared as I was. It was horrifying….I did not want to go back to class after that.

Findings: The Importance of the Cohort

Nina: Anyone in the Posse would be there if I needed them. They're my family. But you don't always love your family. I do love them all, just in very different ways. But I think there isn't a single person who wouldn't be there because there's an inherent obligation that we feel. And – I mean I guess I should only speak for myself but – I feel obligated to be there for all [of them]– because they're my people.

Findings: Pre-Collegiate Training

- Cornelius: PCT gave me a good background of all the different aspects of life, in general, that I need to be more informed about…things that just come up every day here, that just is food for thought like on a daily basis for students here.

- Jochaim: [PCT] prepared us for…some issues that may have arisen at Brandeis. [It was] social preparedness, not just academic preparedness.

Findings: Science Summer Immersion Program

- **Jess** : It was hard. I did not expect so much work, but it was – I feel that it was really helpful. Like, just knowing how, like, labs are so much different than the lab that I was accustomed to back in high school and, like, seeing all this technology was also amazing. But, I mean, all the work that we got that whole – those two weeks, it was just – it was hell. It was just that – it was so different from high school, … it was just, like, all right now you have a lot of work to do, here it is. And it was just hard. But I managed, so that was, like okay, now I think I know what college is going to be like if this is boot camp.

- **Monica**: I think after boot camp is when it really hit me that, "Okay, we're in this together, no matter – whether we like it or not, we're the only ten that know what it feels like to be," at that point, "a Science Posse." …I didn't understand the full concept of what Posse meant until we got to boot camp, and we had to take those classes, and how we could each other help each other, and how sometimes it could get a little, you know, frustrating to be in a group of ten very individual people. I think that's the perfect way to put it.

Findings: Graduate Student Mentor

- **RJ**: [My mentor] is kind of like my mom away from home. She's that person. I always look forward to our one-on-ones. The fact that she was going for her PhD was a huge inspiration. She's just always - she offered tough love so to speak. Like, I know that I could talk to her about anything. But she'd always be open and honest with me in terms of what she thought about whatever it is that I was going through….I love her to pieces.

- **Naitas**: [I] talked with my Posse mentor about how to approach professors… Probably my second test in organic chemistry, first semester. I got a low grade and [my mentor] was telling me, "You know, just go to the professor and ask him how you can improve," and I was just really nervous, one, because I couldn't stand that I got a dissatisfactory grade, and two, because I was just really nervous about approaching a professor who I knew was - might have been doing research on his own time and had a lot of students that he had to care about, and I didn't know that he would be really interested in talking with me…[My mentor's] push helped me to ask for help from the professor. The professor's words helped me in my studying and also realizing that professors, as many students as they may have, that they are attentive to individuals.

Findings: Feeling VIP

- **Jamele:** Just access to science faculty [is important.] The access--it's kind of a little ridiculous, but in a sense we need it [because] the people that we competing against have linages of doctors and linages of all [kinds.] They have so much. Even though to me, from Brooklyn, the fact that I have this faculty support it's a little droplet compared to what other people have that on this campus. I know the kind of resources that they have….It's extremely difficult to be a successful science student here, without Posse or those kind of connections. …I think the reason why Posse is so successful is because I have people here.

- **Kay:** Science Posse works too because you get exposed to so many people in the science field faculty wise. So knowing [senior faculty member] and knowing somebody like [popular faculty member]--just seeing all these people and it's like wow, that is what I can be if I choose to stick with science. [Senior faculty member] just like he's ridiculous. [He's] done so much and I don't know I just feel like [he] is really smart too. Like he's ridiculously smart. I don't know, I guess it's nice to know that you have somebody like that rooting for you in your corner. Somebody that backs Science Posse up and is wanting you to do well….. You have somebody there that is established in science that's 'You're in Science Posse, and I want you to do well." So I think that's really nice like knowing that that you have somebody out there advocating for you that's like established. It's like wow.

Findings: Normalizing Struggle

- **Alisha**: [I thought] "I can't do the sciences anymore. I was, like, I can't." And then I realized everyone was, like, "Ahhh, science is horrible." And then we still had to, you know, get through it. So I was like, "I can stick through it. If my Posse can stick through it, of course, I can stick through it and just go along with them, and hopefully, we all survive."

- **Nasir**: Let's begin with the fact that science is hard. Science is extremely hard… Everybody in the [Science Posse] understands that, "Hey, you know, we're all in this together, and it's all hard." …. Just having an automatic person to fall on, that you already knew, that you could study with and ask questions, and, like you know, joke around with in a sense. Because, you know, it would suck if I was just a regularly admitted student that came into science and didn't know anybody…I know that I got my Science Posse to talk to. And also, previous Science Posses that [have]been through the same thing as me, and [I] can ask them for advice.

Quantitative Outcomes: Science Posse Scholars vs. All Other Students

GPA	Posse	All other students
General Chemistry 1	3.05	3.23
Calculus 1	2.85	3.04
First semester Term GPA	3.22	3.40

- Being a Science Posse Scholar positively correlates with earning a B+ or above in an entry level STEM course
- Being a Science Posse Scholar positively correlates with majoring in STEM

Thank you and Questions

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