

STAYING IN SCIENCE

EXAMINING THE PATHWAYS OF UNDERREPRESENTED YOUTH MENTORED IN RESEARCH

LONGITUDINAL RESEARCH OVERVIEW

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American Museum of Natural History

in partnership with

Alan J. Daly, Consulting; Eclipse Education Research & Evaluation Group;
Education Development Center; & SRI International

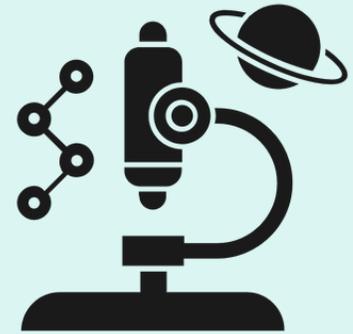


AMERICAN MUSEUM
OF NATURAL HISTORY



STUDY OVERVIEW

The American Museum of Natural History is engaged in a 10-year longitudinal study examining the experiences and pathways of over 560 NYC academically successful youth from backgrounds historically excluded in STEM who have participated in mentored science research experiences as part of the NYC Science Research Mentoring Consortium. The study traces youth trajectories from their participation in a high school out-of-school science research mentoring program through college and into the first years of their careers.



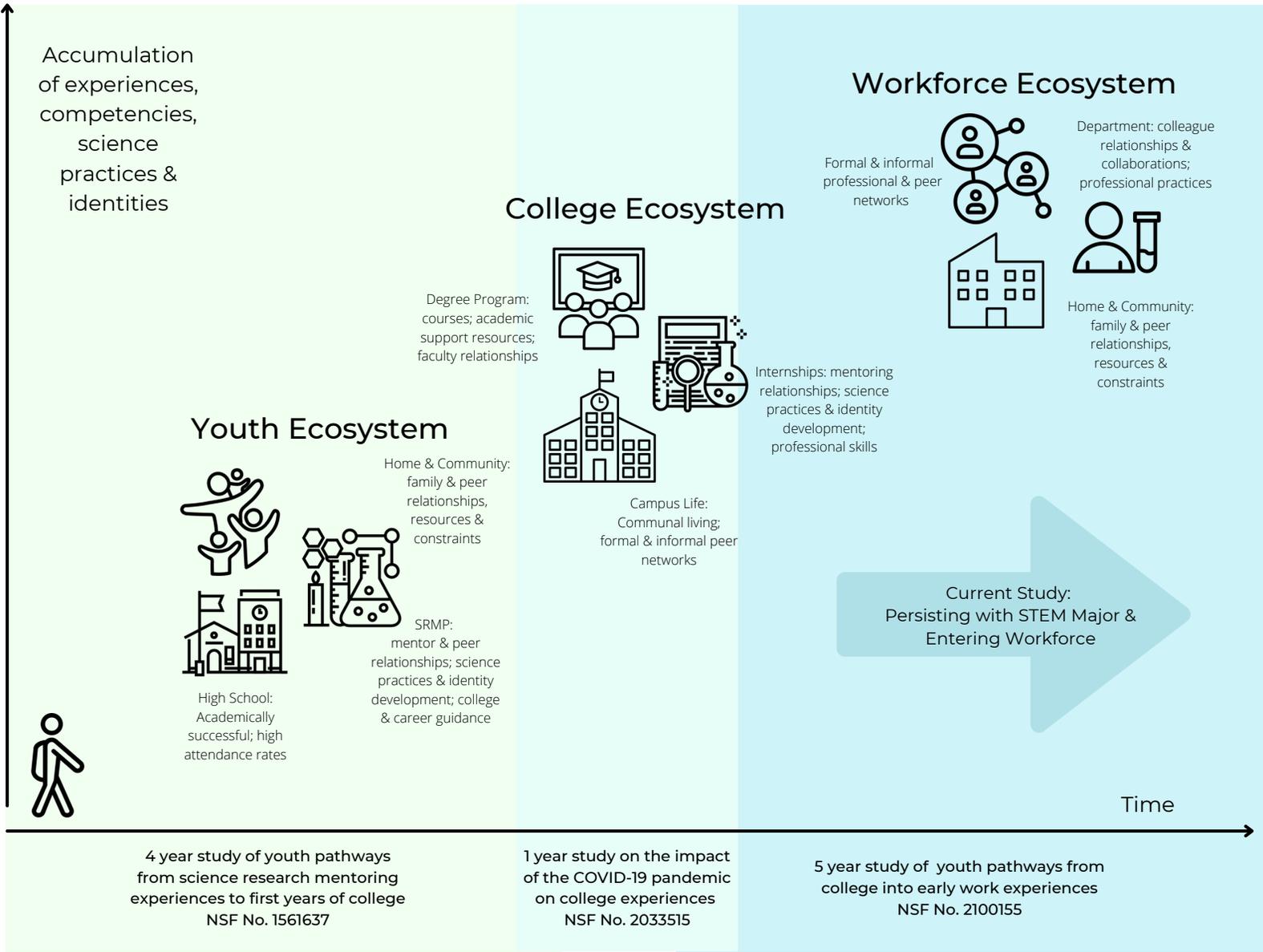
NYCSRMC CONSORTIUM

The NYCSRMC is a partnership among 24 academic, research, and cultural institutions across NYC who share the goal of engaging youth in authentic STEM research experiences alongside scientists, including:

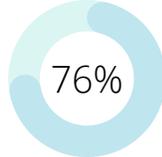


RESEARCH

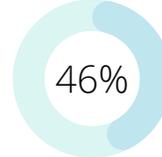
AIM Longitudinal study exploring the potential of our science research mentoring programs (SRMP) in supporting students "staying in science"



Student participants (N=560) represent the population at the center of concerns about equitable science participation (National Research Council, 2016); we see them as holding the potential for building a more diverse and equitable STEM workforce.



Identify as people of color



Almost half are from families with one or more parents born outside the U.S.



Over a third are first generation to enter colleges



More than half are multilingual, communicating with their families in languages other than or in addition to English

Accumulation of
experiences,
competencies,
science practices
& identities

Key Constructs

What We Learned



Home & Community:
family & peer
relationships,
resources &
constraints



Mentored Research:
mentor & peer
relationships;
science practices &
identity
development;
college & career
guidance



High School:
coursework,
grades,
relationships with
teachers & peers



College & Career
Goals: resources
and obstacles to
pursuit of STEM



90% of youth report they are making they are **making valuable contributions to the scientific community and have a strong sense of belonging and connectedness** to program mentors and peers. Youth also report opportunities to **learn science practices** while engaging in authentic research at statistically significant higher rates at their research sites than at their schools. These program features equip youth to successfully engage in STEM coursework and research internships.

Using the large scale administrative dataset, our analysis of the comparison group shows that **participating in the mentoring program is positively related to students' course taking and school attendance**—two important key factors in academic success across the board and within subject areas.

Seventy-five percent of participants intend to major in STEM. Our analysis of social networks surfaced a set of **relational features of persistence that may be especially critical for youth**, specifically adults and peers who serve as mentors, role models, cultural brokers, and supports during the transition from high school to college. While youth regularly reported concerns about obstacles in their academic and personal experiences, **they also felt they had the necessary support to be successful.**

Time

Accumulation of
experiences,
competencies,
science practices
& identities

**Key
Constructs**

**What We
Learned**



Home & Community:
family & peer
relationships,
resources &
constraints



Friends and peers were identified as the most utilized source for both academic and personal/social support during the pandemic.



Campus Life:
communal living;
formal & informal peer
networks



Increased sense of isolation had the largest impact on students' academic and personal motivation and productivity; students reported an **inability to create community and a sense of belonging, particularly for students of color**. Mental health resources were inconsistent and difficult to access.



Internships: mentoring
relationships; science
practices & identity
development;
professional skills



Closed/restricted campuses led to **missed opportunities for peer collaboration, hands-on experiences with science practices, and access to academic support**. Students reported seeking resources related to career pathway planning, class content support, and finding jobs and internships.



Degree Program:
courses; academic
support resources;
faculty relationships



Faculty varied widely in their approach to online instruction; many **students felt isolated, cut off, and hindered in their ability to fully participate in online coursework and develop relationships** with faculty and their classmates.



Time

College & Workforce Ecosystem

We aim to examine the factors that shape whether youth in our study diverge from or continue to pursue STEM majors and careers. Our mixed-methods approach enables us to explore the following key aspects of youths' experiences as they move through college and into their first workplace experiences.

Accumulation of experiences, competencies, science practices & identities

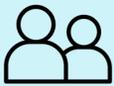
Key Constructs



Future Plans. Intended plans for college and career; shifts towards or away from their planned major.



STEM-Related Internships/Work Experiences: Details of where youth are doing internships and jobs, what kinds of work they are doing and what supports are available to youth in those contexts (including messaging and activities that foster inclusivity and access).



Mentor Relationships: Who, when, and in what contexts youth identify and utilize mentors and the types of support those mentors provide to youth.



Application & Use of Science Practices: Tracks opportunities to apply & use the science practices they had the opportunity to develop while in mentored research in contexts of college, internships, and, when appropriate, first jobs.



Evolving Identity: How youth perceive that they can do science and can envision themselves in science careers.



Feelings of Belonging/Othering: How youth feel welcomed in communities and their experiences with overt & covert biases and microaggressions.



Awareness & Use of Resources: Whether youth & adults are knowledgeable about the structures and activities that can be used to address and manage experiences that create othering/marginalization and if these resources are useful.

Mixed Methods Approach

- Annual Alumni Surveys
- Annual Social Network Surveys
- Annual Interviews with Case Studies
- Youth as Co-Researchers Methods: Photovoice, Visual Ethnography



Time

ACKNOWLEDGEMENTS

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STAY CONNECTED WITH US!

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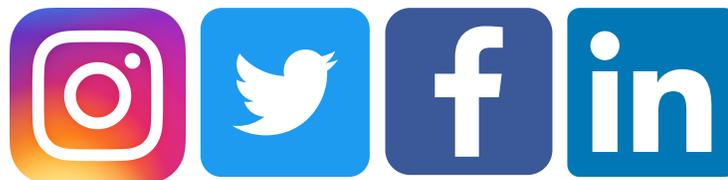
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Findings from this study will be shared via social media platforms through the NYC Science Research Mentoring Consortium.

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Watch our NSF STEM For All Video Showcase Film featuring additional findings of this study here:

<https://stemforall2021.videohall.com/>

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