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SEE ME in STEM: Exploring Out-of-School STEM Education for Gifted Black Girls

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In rather small increments, conversations and scholarship on the experiences of gifted Black girls (GBGs) are emerging in gifted education literature. The narratives around the experiences of GBGs have largely been invisible or used to compare with the experiences of gifted Black males (Anderson, 2020; Collins et al., 2020). Across other educational sectors, much of the scholarship and research on Black girls has centered on advocacy, equity, and for school spaces to recognize their talents and gifts (Anderson & Coleman-King, 2021; Anderson, 2020). According to Anderson, "Our moments of success or achievement are often framed by educators and peers as coincidental or a surprise, not as a norm" (p. 87). With these issues of erasure and invalidation in mind, there have been several calls for an intersectional approach to understanding the needs, characteristics, and schooling experiences of GBGs in K-12 and postsecondary settings. Black girls are not monolithic; conversations around their needs must factor in age, region, type of schooling experience, class, language, ethnic/cultural background, religion, etc. This begs us to question, what do GBGs need to feel seen, excel, and feel safe in gifted programming? We must unpack their ways of being (culture), knowing (theory), and doing (ways they are culturally engaged); elements that have primarily been unexplored in gifted education.

While there is more literature on the experiences of Black girls in STEM education, few have addressed the critical need to examine the nuanced realities of GBGs in STEM-related contexts. As we critically reflected on the out-of-school experiences and research on GBGs in STEM, what is missing from GBG experiences is an intersectional lens and approach. Intersectionality theory examines the interconnectedness of social classifications like race, class, and gender; and how the connectivity of these labels create nuanced experiences and layered barriers to access. We can and should provide K-12 and postsecondary STEM programming that is informed by the nuanced experiences, challenges, and abilities of Black girls who exist at the intersection of race, gender, and—because of the stratification of U.S. public schools—socioeconomic

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status. Intersectionality theory allows us to move beyond surface conversations around identity, providing a framework for critical dialogue(s) surpassing superficial awareness of underrepresentation.

Despite their level of involvement, the unique experiences of Black girls are often an afterthought, and not given focused attention when disaggregating the data, unless designed for Black girls. As we prime pathways for STEM careers and development—schools, educators, families, and other stakeholders must actively center on the needs and challenges of Black girls.

Advancing Equity in Gifted STEM Education

Decades of data show a historical underrepresentation of Black students in gifted education programs. Recent local, state, and national initiatives have been implemented to provide more equitable access to gifted education programs, including providing more culturally competent measures during identification screening. Even so, national data reveals that students' overall access to gifted courses does not necessarily result in equitable enrollment. The U.S. Department of Education (2016) found that even though Black and Latinx students make up 42 percent of the student enrollment for schools where gifted programming is offered, they account for only 28 percent of the program's enrollment. Additionally, while high-poverty schools were about as likely as low-poverty schools to have gifted education programs, students in low-poverty schools enrolled in gifted programs at double the rate creating what the researchers called a "Gifted Gap", especially amongst students of color in high-poverty schools (Yaluma & Tyner, 2018).

Not only have Black and Latinx students been historically underserved and overlooked for gifted programming, they also encounter accessibility challenges to rigorous STEM coursework. In comparison to all U.S. public high schools, schools with high Black and Latinx student populations had less access to intermediate and advanced level STEM courses. Emphasizing the lack of advanced STEM courses available to students of color, a 2016 press release from the U.S. Department of Education reported that only 33 percent of high schools with majority Black and Latinx populations offered Calculus, in comparison to 56 percent of majority White or Asian schools.

Gender Gaps in STEM Education and Career Exploration

When it comes to the perceived achievement gender gap in STEM courses, longitudinal National Assessment of Educational Progress (NAEP) data show that for decades, a gender proficiency gap in STEM subjects has been virtually non-existent. In the exploration of why girls perform on par with boys in K-12 STEM classes but are later underrepresented in STEM undergraduate majors and careers, the theme of gendered stereotype threat is often referenced. Under this concept, girls and women in STEM struggle to feel a sense of belonging in their workplaces/educational settings and as a result, begin to doubt their abilities and question their situational belonging. Investigating the intended majors of high school seniors preparing for STEM careers, Weeden et al. (2020) found a pronounced gender disparity resulting from gendered attitudes about STEM occupations/majors, resulting in more boys' desire to enter biomedical or computer-based jobs compared to girls' nursing and healthcare preference.

This gendered gap in attitudes results in a STEM workforce where men overwhelmingly dominate the computer science field (Funk & Palmer, 2018). A recent study found that in school districts where boys outperformed girls in mathematics, gender employment and income gaps were also present (Reardon et al., 2018). This suggests a social norm of preparing boys for high paying STEM jobs. Because girls, especially Black girls and other girls of color, are dissuaded and locked out of high-earning STEM fields, the existing economic inequities grow. Black women in STEM careers earn 87 percent of their White female counterparts' salaries and 62 percent of the salaries of White men in STEM careers (Funk & Palmer).

Opportunities to Engage Gifted Black Girls in STEM Education through Extracurricular Programming

Using intersectionality theory as a framework, Collins (2018) found that gendered Black student STEM identities influenced Black girls' motivation to pursue STEM courses that would lead to careers in STEM fields. They questioned if they belonged in those fields; if they could/wanted to succeed in those areas; and whether they could accept the level of assimilation required to do so. However, researchers are, and have been, uncovering wonderful opportunities to engage gifted Black girls in STEM education.

Black women/girls' underrepresentation in STEM is particularly noticeable in the computer sciences. Detroit, a city where the majority of public school students come from low-income Black households, is also home to one of the few districts in the nation where girls consistently outperform boys in math (Miller & Quealy, 2018). To harness this untapped talent, Lawrence Technological University in Southfield, Michigan recently announced a partnership with the non-profit organization Black Girls Code's Detroit chapter to encourage girls to pursue STEM careers in engineering and computer sciences. Partnerships that result in extracurricular programming specifically designed to expose Black girls to STEM education can help GBGs excel in those fields and develop positive STEM identities by making the invisible visible—creating spaces for STEM exploration with role models and other girls who look like them.

Redefining the Narrative: Recommendations and Benefits of University-School-Community Partnerships

Considering that out-of-school STEM programming through University-School-Community (USC) partnerships have been spaces for talent development for GBGs, families, educators, and community leaders should engage with

these entities in collective, mutually beneficial capacities. These STEM spaces can redefine the narrative about GBGs and how they see their STEM identities. When we speak of redefining the narrative, we mean disrupting the stereotypical framing and imagery that has overcast the brilliance of Black girls in formal educational spaces. Out-of-school science programs, like Black Girls Code, increase the inclusiveness and accessibility of STEM education. This type of targeted programming also supports young people's acquisition of STEM skills and assists them in making critical connections between science and the practical world around them, while influencing their overall views of the science field. For Black girls in particular, out-of-school STEM education provides an opportunity for participants and practitioners to challenge dominant ideologies not only about who engages in STEM education, but also creates a space where common behaviors of GBGs can be reframed (Anderson, 2020).

Incorporating the expansive funding and resources of colleges and universities, USC partnerships can help close equity gaps in STEM education on larger, more sustainable levels. Studies support that USC partnerships have successfully created pathways for underrepresented student populations to enter STEM college majors and have been instrumental in increasing the graduation rates of Black students in STEM undergraduate and doctoral degree programs (Packard, 2012; Stolle-McAllister, 2011). In these out-of-school environments, Black girls have been able to engage in authentic learning and shift the stereotype threat that may be present in formal educational spaces. The unique camaraderie of peer-supported groups of Black women

Table 1. Reframing Behaviors of University-School-Community STEM Engagement for Gifted Black Girls

Identified Behaviors	**Reframe as…**	**Facilitator's Action**
Challenge authority or too assertive	Reasoning, inquiry, leadership, takes risks to explore intellectual curiosity	-Acknowledge the comments, and situate yourself to "hear", validate, and address the position of the student without being defensive -Acknowledge the creation of new learning and positionality as a leader and thinker in the content -Encourage student to continue to think independently and critically question material and positions on topics given their funds of knowledge and experiences -Listen for valid comments and reframe question(s) or position(s) if necessary, demonstrating to the student that learning is flexible and can be adapted
Loud voices, verve, calling out	Active participation, motivation, curiosity, interest-driven	Create space where various styles of STEM learning, language, and engagement can manifest
Exhibits perfectionistic tendencies	Reposition the environment as a space for risks and can scaffold learning if necessary	Recognizes the characteristics of maladaptive perfectionism, and empowers the student by providing a safety net while they are learning, exploring, and challenging themselves in the content
Deviance from academic norms	Ability to generalize content, flexible thinking, intellectual creativity, exhibits autonomous thinking	Encourage student to continue to explore content using their prior experiences and diverse perspective; asks them questions about their choice and provides support if necessary

Source: Adapted from Anderson & Coleman-King, 2021.

and girls can support the nuanced needs and challenges of Black girls in STEM programming. In turn, these experiences can assist with exercising resilience and perseverance in overcoming stereotype threat, and support them in taking risks and making mistakes, rather than to procrastinate, avoid challenges, or leave these disciplines. As a recommendation, we encourage GBGs to mobilize their agency to support each other, all the while challenging dominant ideologies and maintaining femininity, Blackness, giftedness, and nurturing STEM identity (Collins et al., 2020).

Nurturing a STEM Identity

Collins et al. (2020) called for spaces to acknowledge and cultivate a STEM identity for GBGs. This early exploration, activation, and recognition of their STEM identities should begin in elementary school. For example, by age six, stereotypes that boys are better than girls at robotics and computer programming lower girls' sense of belonging in computer science and limits their access to activities such as computer games and technological toys. USC partnerships can play a pivotal role in helping to define and support a STEM scholar identity for GBGs. To nurture a STEM identity, instructional leaders and stakeholders must be aware of ways in which we stigmatize and penalize the academic and social renderings of GBGs. There are traits, aptitudes, and behaviors that GBGs may exhibit in formal schooling and out-of-school spaces, that may be counter to the hegemonic views (i.e., white, male, middle-class norms) of academic success in STEM. When educators uphold dominant, stereotypical tropes and ideologies about the behaviors of Black girls, particularly in STEM, they police (e.g., discipline) and potentially limit academic potential. We have provided a few behavioral misconceptions that the literature maintains educators view as problematic behaviors for Black girls (see Table 1). We call for a reframing of these identified "problematic" behaviors and ask stakeholders to shift to a strengths-based lens as they interpret the traits, aptitudes, and behaviors of GBGs. Connecting these identified behaviors to out-of-school programming, the perceptions about the capability, capacity, and demonstrations of talent of GBGs should be assessed in these types of programming differently than formal K-12 spaces.

Conclusion

As schools and communities assess and challenge the dominant ideologies and pathways of access for GBGs in STEM, stakeholders must use an intersectional lens to understand the needs, experiences, and supports for GBGs interested in STEM. We posit that out-of-school, USC STEM programming has benefitted GBGs and should be utilized in more robust ways. In doing this, we utilize the resources of collective agencies to provide academic and social-emotional support, in addition to reinforcing a sense of belonging for GBGs in STEM. **THP**

Suggested Organization Resources

- Black Girls Code
  www.blackgirlscode.com
- Black Girls Do STEM
  www.bgdstem.com
- Engineer Girl (National Academy of Engineering
  www.engineergirl.org
- Girls Pursuing Science
  www.girlspursuingscience.com
- Ignite Worldwide
  www.igniteworldwide.org
- National Girls Collaborative Project
  www.ngcproject.org
- State of Black Girls
  www.thestateofblackgirls.org

References

Anderson, B.N. (2020). "See me, see us": Understanding the intersections and continued marginalization of adolescent gifted Black girls. *Gifted Child Today, 43*(2), 86-100.

Anderson, B.N. & Coleman-King, C. (2021). "Catch this magic!": How schools get in the way of gifted Black girls. In S. J. Arki et al., *Teaching Brilliant Black Girls*. Corwin Press.

Collins, K.H. (2018). Confronting color-blind STEM talent development: Toward a contextual model for Black student STEM identity. *Journal of Advanced Academics, 29*(2), 143-168.

Collins, K. H., Joseph, N. M., & Ford, D. Y. (2020). Missing in action: Gifted Black girls in science, math, engineering, and mathematics. *Gifted Child Today, 43*(1), 55-63.

Funk, C. & Parker, K. (2018). *Women and men in STEM often at odds over workplace equity*. Pew Research Center. http://assets.pewresearch.org/wp-content/uploads/sites/3/2018/01/09142305/PS_2018.01.09_STEM_FINAL.pdf

Miller, C.M. & Quealy, K. (2018, June, 13). *Where boys outperform girls in math: Rich, white and suburban districts*. The New York Times. https://www.nytimes.com/interactive/2018/06/13/upshot/boys-girls-math-reading-tests.html?mtrref=www.google.com&assetType=REGIWALL

Packard, B.W. (2012). Effective outreach, recruitment, and mentoring into STEM pathways: Strengthening partnerships with community colleges. In Olson, S. & Labov, J.B. (Eds.) *Community colleges in the evolving STEM education landscape*. (pp. 57-80). The National Academies Press.

Reardon, S.F., Fahle, E.M., Kalogrides, D., Podolsky, A., & Zárate, R.C. (2018). *Gender achievement gaps in U.S. school districts (CEPA working paper no.18-13)*. Stanford Center for Education Policy Analysis. http://cepa.stanford.edu/wp18-13

Stolle-McAlliser, K. (2011). The case for summer bridge: Building social and cultural capital for talented Black STEM students. *Science Educator, 20*(2), 12-22.

U.S. Department of Education. (2016, June, 7). *Persistent disparities found through comprehensive civil rights survey underscore need for continued focus on equity, King says* [Press release]. https://www.ed.gov/news/press-releases/persistent-disparities-found-through-comprehensive-civil-rights-survey-underscore-need-continued-focus-equity-king-says

Weeden, K. A., Gelbgiser, D., & Morgan, S. L. (2020). Pipeline dreams: Occupational plans and gender differences in STEM major persistence and completion. *Sociology of Education, 93*(4), 297–314. https://doi.org/10.1177/0038040720928484

Yaluma, C.B. & Tyler, A. (2018). *Is there a gifted gap? Gifted education in high-poverty schools*. Thomas B. Fordham Institute. https://fordhaminstitute.org/national/research/there-gifted-gap-gifted-education-high-poverty-schools