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Improving Access to STEM for Girls of Color through Community Programs

Pamela W. GARNER[1], Nuria GABITOVA[2], Tiana DOMINICK[3]

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ABSTRACT

Our study examines community youth workers' perceptions, attitudes, and aspirations regarding the development of STEM programming for American girls of color gathered through a focus-group discussion embedded in a professional development workshop. *Results:* Although many of the community youth workers commented about being unprepared to plan or offer STEM programming, they suggested that a collective community effort could be a worthwhile approach for increasing STEM programming for girls of color. The middle school girls of color being served by the community agencies represented in the sample corroborated these results as they too perceived themselves as not belonging in STEM. However, when probed about how they wanted to spend their out-of-school time, many of the girls who asserted lack of interest or belonging in STEM suggested everyday activities that were, indeed, STEM-based. *Conclusions:* This pattern of results suggests that persuading girls of color to pursue STEM-related activities in outside-of-school contexts requires a cultural reframing and the use of empowering language that considers their existing interests.

Keywords: STEM, gender-specific STEM programming; science education; girls of color; community youth workers

[1] George Mason University, George Mason University, Fairfax, VA, USA, School of Integrative Studies and Program in Human Development and Family Science, pgarner1@gmu.edu 0000-0003-4917-9841

[2] iSchool for the Future, Fairfax, VA, USA, wizards@ischoolforthefuture.org

[2] iSchool for the Future, Fairfax, VA, USA, dominickteaches@gmail.com

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INTRODUCTION

Strong preparation in science, technology, engineering, and math (STEM) is associated with the development of technical skills, high-level critical thinking skills, and the ability to perform inquiry-based scientific analyses (Seymour et al., 2004; Thiry et al., 2011), all of which are necessary for a scientifically and technologically advanced global society (English & King, 2015; Kelley & Knowles, 2016). However, the benefits of STEM education and training are not equally available to all students and workers (National Science Board, 2016). Although individuals from all cultural groups display high levels of STEM talent and comprise 38% of the US population, they make up only 13% of the STEM workforce (Jackson et al., 2021). As students, they also are underrepresented in both STEM courses and out-of-school time STEM programs (Amerasinghe, 2016; Stromquist & Monkman, 2000). Increasing participation in out-of-school programs is important because schools do not provide the totality of the experiences required to motivate children from diverse groups to participate in STEM (Ihrig et al., 2018). These programs also are an essential context for STEM learning as they offer more flexible learning opportunities than school courses, especially for students from racially and ethnically minority groups (Moran et al., 2021). Furthermore, culture, family, and the outside community can provide unique opportunities to motivate STEM learning (Young et al., 2019).

Well-developed community-based programs can compensate for the lack of STEM courses in underfunded schools, which are disproportionately attended by students of color (Perry et al., 2012). Although school-based teaching staff plays a critical role in encouraging students' interest in and understanding of STEM educational pathways and careers (Brophy et al., 2008; Campbell, 1995), out-of-school learning programs are frequently operated by community youth workers (Christensen & Rubin, 2020; Colvin et al., 2020). STEM programs staffed by social workers and community youth workers have had success working with students to integrate STEM concepts (Mosatche et al. 2013). Staff competency is critical to community programming (Astroth et al., 2004; Cross et al., 2010; Lardier et al., 2018). However, efforts to regulate the training of community youth workers have been underwhelming (Starr & Gannett, 2016), which could adversely impact the quality of community-based programs (Donaldson & Franck, 2020). The current paper describes a qualitative research effort concerned with whether and how programming developed or supported by community youth workers may increase access to STEM for girls of color. We gathered original data through a focus group discussion with community youth workers aimed at increasing community support for STEM education for girls of color. We were careful to suspend all stereotypical ideas about girls from racially and ethnically minoritized backgrounds and their participation or lack thereof in STEM programming as we engaged with and listened to participants' narratives (LeVasseur, 2003).

American Girls of Color and STEM

Cultural and structural manifestations in STEM may privilege indicators of success that are associated with accomplishments of White male scientists (Miller et al., 2005). Compared to Latin American males as well as White males and females (Simpkins et al., 2015), Latina girls report having the lowest motivation for STEM subjects. Blacks and other students of color are less likely to enroll in and perform less well and have lower interest in some STEM subjects than their White and Asian American counterparts, perhaps because of cultural norms and stereotypes, such as low teacher expectations (Moron & Smith-Mutegi, 2022), that may

interfere with their enrollment and participation in STEM courses (Curran & Kellogg, 2016; Kerr & Robinson-Kurpius, 2004; National Science Foundation, 2015; Zilanawala et al., 2018). Still, students of color who persist in STEM courses are equally as likely as their non-minority peers to complete STEM degrees (Tyson et al., 2007). At the same time, girls and women perform less well in STEM-related courses at all levels, have lower interest in STEM (Dasgupta, 2011; Else-Quest et al., 2010), and are less likely to work in STEM-related careers (Ceci & Williams, 2007).

The exclusivity of the STEM industry is echoed in K-12 classrooms where women and girls of color experience dual marginalization and power inequities (Iruka et al., 2020; Moss-Racusin, et al., 2015). However, focusing exclusively on equity concerns discounts the fact that girls of color can provide a unique perspective that encourages innovations in STEM and advance STEM knowledge in ways that benefit individuals from all sociodemographic groups (Sinnes & Løken, 2014). Attention to equity concerns in the absence of a consideration of the structural intersection of gender and STEM also ignores feminist policies and practices that could address systematic social inequality (Allegrini, 2015). Exposure to sexism irrespective of racial and ethnic backgrounds also appears to negatively influence girls' interest and involvement in STEM (Brown, & Leaper, 2010). Still, gender socialization among some racially minoritized groups may provide girls with experiences and opportunities that discourage interest in STEM (Hanson, 2007). That is, some girls of color do persist in the STEM education pipeline (Joseph, 2017) in spite of being positioned outside of science and mathematics courses as early as the elementary school years, although these numbers remain small (Gholson, 2016). As compared to their White counterparts, some girls of color express positive dispositions toward STEM (Perna, Lundy-Wagner et al., 2009; Riegle-Crumb & King, 2010). However, many studies fail to consider the associations among the multiple identities of race, ethnicity, socioeconomic status, and gender and whether and how they converge to explain variance in student outcomes (O'Brien et al., 2015; Shields, 2008).

The Current Study

Importantly, girls of color are frequently engaged with community organizations that promote culturally relevant values, attitudes, and behaviors (Adams, 2010; Baldridge, 2018). In line with recent research, we reasoned that community youth programs can be influential spaces for teaching and learning about STEM (Lane & Id-Deen, 2020). These programs provide opportunities to explore STEM concepts beyond the classrooms in ways that may be more meaningful and empowering for some learners (King & Pringle, 2019) because they encourage communal responsibility for learning (Young et al., 2019). Below, we describe a program focused on helping community youth workers expand their work to contribute to the development of gender-specific STEM programming aimed at motivating the development of a positive STEM identity among middle-school girls of color. The underlying premise of this work is that access to high-quality programming affirms students' identities and belongingness in STEM (Jackson et al., 2021). We address two research questions:

Research Question 1: What are the perceptions, attitudes, and aspirations of community youth workers regarding the development of gender-specific STEM programming for girls of color?

Research Question 2: What data-driven strategies can community youth workers use to successfully recruit and engage girls of color in community-based STEM programs?

METHODOLOGY AND MATERIALS

To analyze participants' responses, we applied a grounded theory approach, the purpose of which is to generate theory that is steeped in the data, such that the results are driven by the phenomenon that emerges through the process and not from a priori hypotheses advanced by the researchers. Similarly, grounded theory is inductive in that it allows theory construction based upon the data. Specifically, researcher simultaneously code and analyze the data by developing concepts, searching for themes, and integrating them into a coherent theory. This approach also allows for a combination of data sources and methodologies (Glaser & Strauss, 1967), which we present here.

Participants

After first obtaining University Institutional Review Board approval (#1411884-1), we used a purposive sample to recruit community youth workers from a county-collaborative located in mid-Atlantic region of the United States that encouraged staff to learn together, share knowledge, perform needs assessments, develop community-wide solutions, and consider the collective community impact of services and supports. Their perceptions, attitudes, and aspirations regarding the development of STEM programming targeted girls of color were gathered through a focus-group discussion embedded in a professional development workshop. Participants were 17 female community youth workers, 14 of which were Black, one was White, one was Latina, and one identified as bi-racial. Nine of the workers were between 26 and 40 years of age, five were between 44 and 60 years of age, and three were between 21 and 25 years of age. Ten were employed in community afterschool programs; four were employed in schools, and three worked in faith-based programs. Seven had a bachelor's degree, five had a master's degree, four had completed some college, and one had a high school diploma. Fifteen workers had between one and five years of experience and two others had between six and 10 years of experience. We used a focus group methodology because it facilitates interactions that are not possible in one-on-one interviews and produces rich and detailed information from all participants, lending to credibility of the data (Levitt et al., 2018). Sensitive and personal disclosures are especially likely in a focus group setting and some themes only emerge in this context (Guest et al., 2017). All participants gave consent for their comments to be used in program evaluation research.

The Workshop. The six-hour professional development workshop was predicated on research demonstrating that integrating arts and humanities content into STEM education (STEAM) can increase interest in and acceptance of STEM for all students and reduce gender differences (Conradty & Bogner, 2018). STEAM encourages children to illustrate STEM concepts in imaginative ways, such as expressing knowledge through music and dance, communicating with descriptive language, communicating ideas with crafts, graphs, and model-building (Sharapan, 2012). Likewise, social-emotional learning is also important to STEAM learning (Garner et al., 2018; Levykh, 2008) and, therefore, was incorporated into the workshop.

Facilitators discussed the disproportionality of girls and women of color in STEM, beginning in elementary school and into the college years and possible reasons for these patterns. The developers were committed to helping participants understand that working with girls who have experienced exclusion in educational settings requires sensitivity, compassion, competence, and the use of pedagogical practices that encourage confidence in their STEM talents (Stapleton, 2015). Another objective was to work with community youth workers to develop strategies that they could use to successfully recruit and retain girls of color into community-based STEM programs. Distinct practices and experiences that result in successful outcomes for girls of color, such as storytelling, (see Nelson et al., 2008) also were included as elements. Given that safe spaces and the building of community through relationships are important in efforts to bring girls of color to STEM (Brinkman et al. 2018), training in relationship-building also was included.

To establish methodological integrity, we provide information about our positionalities as researchers. The first author who was involved identifies as a Black female from a working-class background with over 20 years of expertise in child development research with children and families from racially and ethnically minoritized groups. The second author is a White female of immigrant origins who developed and conducted the workshop in conjunction with the third author who both have extensive training in STEM and program development for young girls of color. All three authors were involved in the conceptualization of the study, initial code development, and manuscript preparation. The research team operated consensually and met regularly to talk through the questions, coding, and issues related to patterns that were emerging in participants' responses. Discrepancies were resolved through consensus.

The workshop combined instructor-led discussions, and sharing and teaching that included practical hands-on activities, discussions, and reflections. Afterwards, participants were invited to respond to a set of focus group questions and their verbatim quotes were interpreted through a qualitative analysis, which were audio-recorded and supplemented by researchers' pencil and paper notations. Responses were kept confidential and viewed only by the researchers.

FINDINGS

Data Sources and Analyses

The first data source was the community youth workers' responses to three questions: "Is your organization adequately preparing girls of color for futures in STEM?", "What are some of the challenges your organization faces in this endeavor?", and "What are some possible solutions to these challenges?" The focus group discussion was conducted after the formal workshop began and was monitored by two female researchers, both with minoritized backgrounds. We first familiarized ourselves with the data. Next, initial codes for organizing the data were generated, and the data were organized in relation to the themes, which were reviewed for accuracy, and defined and labeled to assign meaning to response patterns (Braun & Clarke, 2006). A theme captures important information about the data in relation to the research questions and represents patterned and meaningful responses within the data. Researchers studied the comments to identify emerging categories using unrestricted coding until theoretical saturation was reached, such that no "new" categories or themes emerged from the data (Guest et al., 2006). After coding the data individually, two researchers met and came to final consensus about the themes yielded from individual analyses.

To establish trust and confidence in the data, we demonstrated rigor by noting that all the available community youth workers in the collaborative from which we recruited were included, which means that responses provide an accurate representation of participant perspectives (Thomas & Magilvy, 2011). We also considered how well the themes represented the data and determined similarities within and differences across themes by presenting representative quotations from the transcribed responses. Lastly, we sought agreement among the coders and the participants themselves (Campbel et al., 2013). Two researchers independently coded the responses into categories. We provide labels for the categories below. A comparison of the responses resulted in a kappa of .82.

Analysis of the responses yielded three themes regarding community youth workers' conceptions about why so little out-of-school and community-based STEM programs target girls of color: Lack of Belonging in STEM, Focus on Mental Health Services, and Community Cohesion. Lack of Belonging in STEM reflected the community youth workers' perceptions of themselves as lacking in knowledge about the definition and applications of STEM to real-world concerns. For example, although the community youth workers indicated awareness of the importance of STEM for girls of color, their statements also demonstrated ambivalence about what offering that type of training meant for their work lives and whether there was support from their supervisors for this type of programming. Participants also discussed feeling undervalued and underperforming in STEM when they were students themselves and commented that girls of color would benefit from learning about STEM from appropriately trained community youth workers with whom they share a common history and cultural experience (see Nolas, 2014). The Focus on Mental Health Services theme centered on the community youth workers' perceptions of and prioritization of their agencies' roles in the provision of community mental health services and support for students and their families. The final theme of Community Cohesion reflected community youth workers' perceptions that, although they felt unprepared as individuals to plan for or offer STEM programming, they believed that a collective effort among the organizations would be helpful in this regard. Some of the community youth workers acknowledged that their individual agencies could offer STEM-related programming with the help of outside STEM experts and that they could work together to develop a model that could be implemented in one of the programs to work out kinks and develop a model for others to follow.

Table 1.
Quotes Illustrative of Each Theme.

Theme	Quotes
Lack of Belonging in STEM	"I need to know more about all of the careers girls of color can pursue STEM careers so that I can help provide the right kind of training. If the girls see me as interested in STEM, maybe they will be too." (Participant 7) "I stayed away from STEM classes when I was in school. I know it is important, but I am not sure I can make a real contribution to this effort" (Participant 3) "I don't think my supervisor is confident in my ability to plan or organize STEM training" (Participant 5) "I am trying. I know jobs in STEM are going to outnumber other jobs, but teaching STEM is not my interest." (Participant 12) "I did not have an interest in STEM as a young person. I do not have an interest in it, cannot teach it. Looking online to find activities is also a big challenge. (Participant 10)
Focus on Mental Health Services	"We are a mental health organization and we are barely able to address the broader issues that girls of color experience, such as anxiety and depression" (Participant 3) "The girls we serve have so many unmet social needs that we have difficulty addressing as it is. Adding STEM would be an uphill climb." (Participant 5) "The main thrust of my program is to provide afterschool care for children whose parents work late. The programs we offer are focused on the social emotional needs of at-risk youth. We are behind the eight ball and are working with students to enhance their social-emotional skills and help them with homework they already have" (Participant 1) "Working on STEM is very time consuming and I have too many other things to do because of the community's large need for mental health services." (Participant 17) "Sometimes, I am forced to be a mother to the girls in my program because they have so many needs that are not being met within their families, which can prevent me from engaging in creative programming like STEM education. We are a family" (Participant 17)
Community Cohesion	"I have colleagues who work on these kinds of programs and I could connect to some of them for help with this kind of programming." (Participant 11) "I could start small and get other people to help me." (Participant 11) "One solution may be to figure out what my program needs and to consider what new staff I can bring in who can teach and lead in this area when there is a chance to hire." (Participant 15) "Better communication between agencies could improve planning for STEM" (Participant 1) "Maybe we could work together to identify the agency with the most resources and best opportunity to develop a STEM program and use it as a model for the rest of us" (Participant 6)

Table 1 displays an illustrative quote for each theme.

These data were triangulated and verified with the community youth workers' quantitative workshop ratings and through quantitative data collected from girls served by the represented community agencies. After the focus group discussion, community youth workers completed a 10-item survey, which examined their overall satisfaction with the workshop. Questions were concerned with the extent to which they believed that STEM programs should be staffed by individuals who reflect the demographics of program participants, their conceptions of the

potential of the workshop to inspire confidence about STEM program development, and beliefs about the extent to which the workshop impacted their own STEM learning and plans for future STEM work with girls of color. Participants responded to each question using a 5-point Likert-type scale (1 = *completely disagree* to 5 = *completely agree*). Internal consistency for this measure was .88. Mean ratings ranged from 4.23-4.71 (out of 5), indicating that, overall, they perceived participation in the workshop as adding value to their thinking about STEM in relation to improving access for girls of color.

As multiple data sources strengthen qualitative data analysis, we also used insights from the girls being served by the community youth organizations represented by participants to triangulate the data. One semester later, one of the authors visited two middle schools located in the same catchment area as the community collaborative that sponsored the workshop. Her objective was to recruit girls into a community-based STEM enrichment program. School personnel and parents had earlier given permission for students to receive information through strategically-placed flyers in classrooms, lunchrooms, and other high-traffic areas in the school. School staff worked with the authors to brainstorm about how to best to reach interested girls. During lunchtime and between classes, interested girls in grades 6-8 were directed to a table staffed by community youth workers who spoke directly to the girls about the program using a brief PowerPoint presentation and STEM-related game. In all, 70 girls engaged with the researchers. Thirty-two girls identified as Black, 18 as Asian, 11 as Latina, and nine identified as White. Girls who approached the table were asked two questions: "Are you interested in STEM?" If girls responded "yes", there were probed with an additional prompt of "What do you like about it?" If girls answered no, they were asked: "What *are* you interested in and what would you like to do in an out-of-school program?" Girls' responses to question were coded as "0" for *no* and "1" for *yes*. Sixty girls responded "*no*" and 10 responded "*yes*". This finding bolstered the lack of belonging that the female and racially minoritized community youth workers commented about during focus group discussions. Results also demonstrated a significant difference in STEM interest across race/ethnicity, $\chi 2(1, N = 70) = 9.32$, $p < .03$. A post-hoc subgroup analysis revealed that Asian American girls were particularly interested in STEM, $p = .01$. No other significant differences emerged.

When asked what they *were* interested in and what they *would like* to do afterschool, the 60 girls who perceived themselves as uninterested in STEM, 24 reported that they wanted to spend their out-of-school time doing art, seven were interested in social media, six were interested in language, five were interested in music, five others were interested in fashion, three were interested in cooking, and three girls were interested in robotics. Girls most often suggested art, $\chi 2(1, N = 53) = 76.17$, $p = .0001$. As discussed below, these activities require STEM knowledge and suggest that many girls of color who perceive themselves as not belonging are indeed interested in STEM when they can see real-world applications and how arts and humanities content is integrated into the learning. Qualitative and quantitative data are integrated and included as part of the interpretation and discussion of the study results.

DISCUSSION

We examined the perceptions, attitudes, and aspirations of community youth workers regarding the development of STEM programming for girls of color. We also evaluated whether proposed strategies operated to interest and engage girls of color into out-of-school time STEM programs. We focused on community youth workers because they work in organizations that are designed to be a safe space where the self can be developed and supported. As well, these programs offer a counterspace to the ones that marginalized and racially and ethnically minority students often encounter in schools (McLaughlin et al., 1994). Moreover, community youth workers typically work and live in the same communities as the children they are serving, and, therefore, they are especially likely to understand the cultural nuances that these students experience at home and school (Baldridge, 2018; Hirsch et al., 2000). These workers also have a major decision-making role regarding the types of programs that are available to students. Equity concerns regarding STEM have typically focused on increasing the representation of White females and males of color (Campbell, 1995), despite the fact that males and females of color have unique experiences with regard to STEM. For example, girls and women of color experience both racism and sexism in the pursuit of STEM (Ireland et al., 2018; Joseph, 2017; Wright et al., 2016). In fact, many girls of color lose interest in and confidence about STEM during the late elementary and middle school years (Hughes et al., 2013). Although some girls of color derive their self-concept of smartness from "doing" of science or math (Gholson & Martin, 2014), data compiled by the NSF (2011) suggests that Black, Latina, and Native American women comprise only about 3% of the STEM workforce, with the exclusion of the biological sciences. This trajectory for this lack of participation may begin much earlier, as many elementary school teachers do not have the background knowledge, interest, confidence, and efficacy for teaching STEM (Joseph et al., 2017).

Consistent with possible selves' theory, which is focused on describing how one's current and future self-representations motivate behavior and factor into career choices and goals (Lips, 2007; Markus & Nurius, 1986), many teachers also disregard the potential of girls of color for STEM learning and training because they endorse stereotypical beliefs about who 'should' be interested in STEM (e.g., Pringle et al., 2012). Our results suggest that these conceptions and beliefs also are endorsed by community youth workers for both themselves and the girls they serve. Thus, many girls of color are deprived of STEM opportunities both within and beyond the classroom. Although the vast majority of the participating girls perceived themselves as not being interested in STEM, all who responded indicated interest in activities based in or inspired by STEM, even when they did not use STEM-related language. Integrating the arts and humanities into STEM activities and vice versa can help children develop critical thinking skills and may make STEM learning science more relevant and encourage enthusiasm and support individual self-efficacy (Garner et al., 2018). This may be particularly true for girls, who tend to be insecure about their skills in this area (Henriksen, 2014). Film, music, and design, when integrated into STEM education, can propel girls' interest and engagement in science. That is, research has revealed robust correlations between artistic, musical, literary and crafts activities and measures of later success in STEM subjects, including Nobel Prizes and numbers of patents or companies founded (Root-Bernstein, 2015). Many of the girls also indicated an interest in social media, which represents a variety of technology and communication-based activities and provide a means for scientists to boost their professional profiles. Similarly, cooking, which

some of the girls listed as an out-of-school interest, requires rudimentary understanding of chemistry as well as mathematical measurement concepts, and a basic understanding of agriculture and conservation science (Aguilera, 2018). Fashion, a choice of several of the girls, also intersects with STEM in that it involves design thinking, an understanding of shapes and patterns, geometry and math, and embraces elements of engineering, 3D thinking, and material design (Braddock Clarke, 2018; Deaton et al., 2018; Shirley & Kohler, 2012). Thus, out-of-school programs that offer STEM content for girls of color through a culturally-relevant lens and embrace their interests and innovations within the context of scientific inquiry may be especially effective (Morton et al., 2022).

In relation to our goal of advancing a discourse that disrupts stereotypical beliefs about who belongs in STEM, our results suggest that professional development opportunities and the collective skills, talents, and resources of colleagues working in other community organizations may encourage community youth workers to support STEM programming that specifically targets girls of color. Findings also suggests that there is much work to do at the administrative levels of community organizations. Structural disruptions, community influences, and resilience strategies play a significant role in whether girls of color persist in STEM subjects (Joseph, Hailu, & Boston, 2017). It is important that females of color to participate in counter spaces that protects them from isolation and microaggressions related to their participation in STEM. These spaces should operate in ways that are conceptually and ideologically congruent with how girls of color learn (Ong et al., 2018). Culturally-relevant STEM programs can serve as a counterspace that encourages racial/ethnic and gender equity (Borum & Walker, 2011). The workshop we presented integrated program elements and pedagogical strategies that encourages individual agency and the inclusion of STEM-related content that closely aligns with students' prior experiences and ways of knowing (Aronson & Laughter, 2018; Kayumova et al., 2015).

Focus group responses and surveys indicated that community youth workers perceived themselves as benefitting from participation in the workshop. Benefits of one-shot interventions for improving individuals' perceptions of their attitudes and skills have been demonstrated in another research (e.g., DeBacker et al., 2018). Regarding the focus groups, the community youth workers reported being cognizant of the fact that girls of color can benefit from exposure to STEM enrichment activities that occur outside of school because these non-school activities allow for more "doing" and emphasize creativity and real-world applications in a grade-free environment (Dasgupta & Stout, 2014). Although we found that Asian American girls were especially likely to report being interested in STEM, there is evidence that they too often question their own STEM competence (Cooc & Kim, 2021) and are subject to stereotypical views and attitudes that limit their STEM opportunities (Paik et al., 2018). Thus, these girls should be included in any effort to promote interest and engagement in STEM for girls of color.

CONCLUSIONS

Our findings suggest creative and design activities that are not accessible during the school day may attract girls to STEM (Cooper & Heaverlo, 2013). Non-traditional approaches to STEM education also may serve as an engaging introduction to its real-world applications, which may be particularly important for girls of color. We also found that empowerment language worked

best for recruiting the girls into the STEM classes. Interest in and engagement with STEM for girls of color also can be improved through the adoption of culturally-respectful and compassionate approaches that validate and utilize their own cultural resources (e.g., Tan & Calabrese Barton, 2012). More also needs to be done to introduce teachers and program developers to well-known scientists, inventors, and female STEM professionals of color, as the community youth workers could only point to two women who fit these criteria. Media images of STEM professionals influence public perceptions of the participation, status, role, and contributions of women in STEM. These images are primarily of males. Even when females are presented, they often are projected in secondary roles and females of color are typically non-existent (Steinke & Tavarez, 2018). Programs absent of the culture and context of girls of color may send a message to them that they do not belong to STEM. Whether and the extent to which this workshop worked to motivate community youth workers to increase their efforts to develop, design, and/or facilitate culturally responsive STEM programming for girls of color is a highly relevant question for future research.

Declarations

Authors 'contributions
All authors were involved in all elements of the research and approved the final manuscript.

Availability of data and materials
All data generated or analyzed during this study are included in this published article. The data generated during and/or analyzed during the current study are not publicly available for reasons of confidentiality.

Conflicts of interest/Competing interests
The authors have no relevant financial or non-financial interests to disclose.

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