

Creating a Bridge to Sisterhood

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Dr. Laura Bottomley, Teaching Associate Professor of Engineering and Education, is also the Director of Women in Engineering and The Engineering Place at NC State University. She has been working in the field of engineering education for over 30 years. She is dedicated to conveying the joint messages that engineering is a set of fields that can use all types of minds and every person needs to be literate in engineering and technology. She is an ASEE and IEEE Fellow and PAESMEM awardee.

Ms. Crystal R. Emery, URU The Right to Be, Inc.

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Crystal Emery is known for producing narratives aimed at creating a more equitable society. She is the Founder and CEO of URU The Right To Be, Inc., a nonprofit content production company that addresses issues at the intersection of humanities, arts, and sciences. Emery is a member of the Producers Guild of America and New York Women in Film and Television, and was selected in 2019 as an AAAS IF/THEN Ambassador. She has designed and produced several groundbreaking Virtual Reality Learning Experiences.

Emery has been hailed as "inspiring" by the Los Angeles Times and as a "leader in science and technology" in the Good Housekeeping feature "50 over 50: Women Who Are Changing the World." She has extensive publishing credits, both independently and with established publishers including in TIME, Variety, Ms.Magazine.com, Rebecca Minkoff Superwoman and HuffPost. Other published works include Stat! An Action Plan for Replacing the Broken System of Recruitment and Retention of Underrepresented Minorities in Medicine with a New Paradigm, published by the National Academy of Medicine; the unique biographical essay books Against All Odds: Black Women in Medicine and Master Builders of the Modern World: Reimagining the Face of STEM; and the first two volumes of her Little Man children's book series.

Her body of work covers a broad range of topics, from diversity, inclusion and equity to children's literature, sociopolitical issues and STEM. She has been a keynote speaker for distinguished institutions like the National Security Agency, National Institute of Health, National Organization on Disabilities, and RespectAbility. Recently, Crystal began production on "The Intersection of Crystal R. Emery", a series of podcasts exploring Crystal's life as a Black woman, filmmaker, writer, and a quadriplegic.

Her contributions have been recognized with numerous awards, including the Congressional Black Caucus Health Braintrust Leadership in Journalism Award, the BronzeLens Film Festival Spirit Award, the Trailblazer Award from NANBPWC and the United Nations as part of the International Year for People of African Descent, and the Yale University Seton Elm-Ivy Award.

She has appeared on TedX Beacon Street, where she spoke on the intersection of race, gender, and disability and participated as an expert panelist in the award-winning curated film series "Tell It Like It Is: Black Independence in New York 1968-1986" at the Lincoln Center. Emery served as a consultant to the Connecticut Health Foundation's Dental Initiative and to former New Haven Public Schools superintendent Dr. Reginald Mayo. She currently sits on the City of New Haven's mayoral Blue Ribbon Reading Commission, serving as co-chair of its Birth-Grade 3 Early Childhood Subcommittee.

In 2016, Emery's film "Black Women in Medicine" cleared all Academy of Motion Picture Arts and Sciences requirements necessary to qualify for an Academy Award nomination in the "Best Documentary" category. "Black Women in Medicine" went on to international screenings in Ethiopia and Germany in 2018 as part of the American Film Showcase, which is considered the premier American film diplomacy program in the world.

In 2015, Emery conceived, designed and launched Changing the Face of STEM, an innovative national educational and workforce development initiative. In 2017, Emery, in conjunction with the National

Academies of Sciences, Engineering, and Medicine, introduced Changing the Face of STEM at the National Academy of Sciences (NAS) in Washington, D.C. URU returned to the NAS for its third engagement on June 10, 2019, where Emery unveiled the "You Can't Be What You Can't See" Virtual Reality Project, aimed at closing the identification gap for young marginalized students within the STEM realm. IN 2019, Crystal lead URU in a successful effort to become a programmatic partner of 100Kin10, an organization formed in response to President Obama's call during his 2011 State of the Union address to train 100,000 new STEM teachers in a decade.

Emery believes that perseverance, faith, and trusting in a power greater than oneself comprise the road to success. She continues to shape a successful, fulfilling personal and professional life while triumphing over two chronic diseases as a quadriplegic.

Emery received her B.A. from the University of Connecticut, her M.A. in Media Studies from The New School of Public Engagement, and an honorary Doctorate of Letters from UConn in 2018, on which occasion she gave the Commencement Address to an audience of over 20,000. In so doing, she became the first Black female speaker at UConn's College of Liberal Arts and Sciences, and the first commencement speaker to receive two standing ovations.

Valeria Sinclair Chapman

Creating a Bridge to Sisterhood

Abstract

Despite considerable efforts the representation and inclusion of white women and women of color in STEM both in the academy and in industry remains low and in positions of leadership even lower. On the surface, it would seem that, working together as allies, women of color and white women could enact significant change. Yet, creating these alliances is challenging and we suggest that as a result progress is limited. In June of 2019, a unique event was held at the National Academy of Sciences. This event brought together approximately forty white women and forty women of color to discuss the issues that both linked and divided them. The previous day, the participants had met separately as a group of white women and a group of women of color. Our efforts are informed by several theoretical frameworks: (1) internalized oppression (2) self-efficacy and resilience (3) transformative change; (4) thought mapping for action; and (5) building alliances for policy reform. This paper will discuss the results of an assessment conducted in parallel with the events and as a follow up.

Introduction

Women come bearing different histories, sizes, skin tones and hair color, yet, in a highly gendered society, they share many of the same experiences. Women are often overworked, underpaid, undervalued; still, they remain a formidable force to be reckoned with, especially when we come together and work as a group. Imagine if we could combine our energy toward collective action—how quickly could we repair some of the damage to ourselves, to our psyche, to our families, to our communities, to the world at large?

For women in STEM to affect – and achieve – leadership and representation at the highest levels within their fields, meaningful relationship-building among themselves and across the racial, ethnic and cultural groups they represent must occur. A big elephant in the room is the unsteady and fragile relationship between white women and women of color, however. This divide seems greater within the world of STEM in part because many of us work in silos. And many of us are introverted and isolated. Whatever the reason, we must close this gap. Bringing together such a diverse group of STEM professionals, eliciting their input and applying direct programmatic design will empower participants to return to their home environments equipped with tools and resources to impact how they, as women, interface with one another while also cultivating meaningful, transformative change in the status quo. Kezar [1] analyzed emerging theories of institutional change as being effected by networks of change makers, rather than by disconnected individuals, which has been the norm. Generally, researchers in STEM or STEM education identify a need for change, targeted at increasing diversity for example, and then work in their individual spheres to bring about that change. The result of fifty years of such efforts has been a distinct lack of institutional change. Clearly a need exists to give attention to creating change networks, rather than operating as individual change agents.

The inaugural Building Bridges—The Power of the Sisterhood workshops were held in 2014 in Albuquerque, NM, at Wellesley, and at Yale¹. In June 2019 the workshop was changed to a two day format and held at the National Academy of Sciences in Washington, DC². The driving force behind the workshop came from the mind of Crystal Emory, who worked with leaders at the Academy, along with faculty from leading universities across the country to organize the DC Building Bridges conference. Following DC Building Bridges, we have hosted a webinar with participants from the June conference and worked with a new group of participants in Dallas, TX. The vision of the conferences is for women to come together to affect and achieve leadership in STEM³. The conference aims to tackle some of the biggest barriers to the combination of such efforts, directly engaging how to build meaningful relationships among women across racial, ethnic, and cultural barriers. The historically siloed nature of work in STEM has both reinforced and exacerbated the unsteady and fragile relationship between white women and women of color.

DC Building Bridges included leaders from a variety of arenas, including academia, government and industry. The participants came from across the fields of science, technology, engineering, mathematics and medicine (STEMM). Some of the participants were experts in the fields of research associated with women in STEMM fields, and some had little experience with social science research. The discussion topics were chosen to invoke thought and to be challenging, with attention to creating spaces that were judgement free. These spaces, however, were not declared to be “safe.” Rather, participants were invited to create a “brave space,” where mistakes would be honored and attendees would receive permission to change their views during discussion. The women were asked to read a poem, “An Invitation to Brave Space,” which begins, “Together we will create *brave space* because there is no such thing as a ‘safe space...’ and ends with the words, “We have the responsibility to examine what we think we know. We will not be perfect. This space will not be perfect. It will not always be what we wish it to be, but, it will *be our brave space together, and we will work on it side by side*” (*emphasis original*) [2]. There was no promise not to offend, but there was a promise not to disengage. The participants were asked to recognize that the work of bridging entrenched racial divides is, in fact, what our mothers would have called “kitchen table work” [3] and [4]. Participants were asked to assume a position of cutting edge messiness.

¹ While Building Bridges-The Power of the Sisterhood is organized like a conference, it operates more as what its founder terms an (*un*)conference. An (*un*)conference deconstructs the familiar conference format of panels, guest speakers, rigid scheduling, and one-way knowledge flows from expert to novice. Drawing on insights from intersectional feminists, Building Bridges eschews guest speakers, panels, and keynotes in favor of facilitated discussion and reduced power dynamics, allowing for more fluidity in the scheduling, greater interaction between participants, and encouraging a sense of belonging and reciprocity. In this space, learning is reciprocal and horizontal rather than hierarchical; participants move between leading and listening.

² The five year gap between the initial conferences and the 2019 launch of the two-day format is due, in part, to other personal and professional demands on the conference’s founding organization [redacted]. In addition to the Building Bridges conferences, this organization offers a range of conferences aimed at celebrating, promoting, and improving diversity in STEMM in K-12 education, higher education, and industry.

³ According to the Association of Women in Science, making the academy and industry spaces where more women can thrive will require, “implementing innovative approaches to systemic change” [AWIS, n.d., <https://www.awis.org/intersectionality/>]. We maintain that Building Bridges, with its attention to difficult conversations and real-time activities designed to facilitate self-reflection and commitment to nurturing sisterhood is one such innovative approach.

Our theoretical framework draws from literature in several areas, including literature on internalized oppression, self-efficacy and resilience, transformative change, and building alliances for policy reform. Our approach to building bridges to sisterhood in STEM is premised on an underlying theory that the way that women understand and see themselves individually and within the groups that they most frequently engage informs how women interact with other women whom they may not see as ready allies. Not only do women enter women-based collaborations with their own internalized views of themselves and the groups to which they belong, e.g., self-doubt, imposter syndrome, views on advantage or disadvantage, perceptions of power and powerlessness, and so on; but they also do so in the contexts of mistrust, e.g., seeing other women as competitors or allies, using shorthand stereotypes to interpret the words and actions of other women. These often hidden notions that women have of themselves and other women can influence their ability to develop sisterhood bonds which, in turn, influences the degree to which women can come together to create transformative networks and lasting alliances for policy change. Before we provide an overview of the DC Building Bridges conference, we discuss each of these conceptual building blocks, in turn.

Resilience and Internalized Oppression

Bekki, et al. [5] refers to a program to increase resilience in STEM women that focuses on interpersonal and intrapersonal problem solving skills applied to non-technical situations. Women in STEM tend to have strong problem solving skills, but may not apply them to social skills. This study showed that developing those skills particular to being a woman in STEM increased resilience. Research indicates [6] that resilience and one's self-understanding directly impinge on one's motivation and resilience. One's self-understanding and internalized theory of self are affected by one's experiences of marginalization, particularly systemic racism and sexism, which are both endemic in STEM fields [7] and [8].

Change Agents and Change Networks

In order to effect system change, change agents need both knowledge of theories of change and an understanding of self. Connolly and Seymour [9] point out that, "Theories of change matter because they are usually implicit, and what remains unseen cannot be questioned," which implies we must consider that all participants may have implicit theories that neither they nor the facilitators know of—in other words, that participants have hidden theories and assumptions that will affect the outcome of a workshop. Dweck [10] further explains that, essentially, individuals have implicit biases about how organizational change can be incited, and those innate theories, frequently unknown to the individual, can affect how that person behaves as a change agent. The design of the Building Bridges workshop acknowledges this relationship and confronts it directly.

Building Bridges-The Power of the Sisterhood, Washington, D.C.

The objective of the conference was to convene a diverse set of women across STEM disciplines (science, technology, engineering, mathematics, and medicine) with expertise or interest in advancing women in their fields. Women, and particularly women of color, remain underrepresented at many levels of STEM, despite evidence of some progress in recent decades. Fundamentally, the goal of DC Building Bridges was to explore the ways that women

can become advocates for each other. Through a process of self-reflection, difficult group conversations, and teamwork, the women gain a better perspective of who they are, what they believe, what they can provide, and the barriers that might prevent them from developing resilient, transformative relationships with other women to change our collective circumstances for the better. To change the academy and industry in meaningful ways, women will need to see each other as allies. Given the norms of solitary work and achievement, the small numbers relative to men, and the mistrust that some women have of each other, allyship built on sisterhood remains elusive, but not impossible. Building Bridges is a powerful way to model processes that allow for self-awareness, honest communication, recognition of the experiences and perspectives of women are differently situated from ourselves, and the amazing potential of sisterhood to cut through the noise and allow for creative problem-solving through collaboration.

The conference uses a two-day format. The first day is dedicated to separate but complementary work by white women in one group, and women of color in the other. This division is deliberately designed to facilitate open expression, honest conversation, and trust amongst participants. In addition to encouraging women to see the other people in the room as “sisters,” working in separate groups allows facilitators to push participants to voice and challenge misconceptions that they may have about women from the other group and misconceptions that they might feel others have about them. For instance, two white women led the conferences for white women. The facilitators insisted the women acknowledge whiteness and the unearned privilege that comes as a result of identifying as members of a dominant racial group. Whiteness, as a form of privilege and power, is often made invisible in public interactions. It was essential that white women explore what it means to be white, that white women consider the privileges and responsibilities that come along with being white in a sisterhood. Likewise, black women led the conference for women of color. It was important that women of color explore what it means to be connected across racial and ethnic identity, which included African American, Latina, Native American, and East Indian backgrounds. What were the misgivings that women felt about each other? What were some of the sources of feeling left out or hurt, be it age differences, class, or nationality? White women and women of color were encouraged, indeed, pushed to explore tensions, feelings of privilege and guilt, anger, doubt, and the weight of having to be “strong”— all of which present barriers to lasting sisterhood.

The work of the white women was focused on learning more about and establishing the potential for sisterhood, among the women in the group as well as with their colleagues who are women of color. White women considered how women have countered marginalization over time, the achievements and failures of women’s movements, and how, despite the challenges faced by all women, white women in particular might use their power and access to empower women of color. The work of the women of color was to acknowledge the challenges of sisterhood, especially those related to judging and trusting other women. The women of color addressed the myth of the superwoman, the loneliness of leadership, loving themselves, and moving from hurt to healing, among other topics.

DAY 1

For each set of women, the day opened with an invitation to create a brave space and a review of learning guidelines. Materials were provided by the facilitators. Participants were asked to introduce themselves without regard to the positions that they hold in their professional lives.

This stipulation was intentionally designed to reframe the power dynamic in the room. We wanted the women to come together as equals rather than to defer to various individuals based on traditional forms of power, e.g., leadership positions, funders, or rank. We had to emphasize that this was not a networking event, nor was it a space for passive bystanders. Participants could choose to step back, as needed, but they would always be invited to reengage. A series of large and small group discussions were held to explore how women see themselves, women in their own racial, ethnic, or cultural groups, and women outside of those groups. For instance, women of color were invited to consider “the difference between ‘seeing’ each other and ‘being seen’ by each other,” while white women were asked “what are some of the historical sources of mistrust between white women and women of color?” Both groups reflected on the meaning and significance of “white fragility” as a potential disruptor to allyship between white women and women of color. Before departing, the women in each group were asked to consider, “my side of the bridge.” What am I bringing to build? What do I need to dismantle? Both groups ended Day 1 with a ritual sand ceremony where participants were invited to close out the day with a public indication of their commitment to the journey toward sisterhood. The sand ceremony is built on an ancient tradition of sealing agreements with a “salt covenant” wherein each person would take pinch of salt from their pouch and place it in the pouch of the other. This agreement could only be broken if an individual could retrieve their own grain of salt from the pouch. The sand ceremony was an incredibly moving way to end Day 1.

DAY 2

Day 2 brought both sets of women together. The facilitators on Day 2 were composed of the leaders from the previous day. Therefore, leaders on Day 2 were both white and women of color from various backgrounds. Equipped with the tools developed on Day 1 for self-reflection, honest conversation and risk-taking, and openness to see and hear things differently, the participants were invited to once again enter a brave space for the work that lay ahead. Once again, the women participated in large and small group discussions. Topics included: the value of collaboration, white fragility, stereotypes of the “angry black woman,” the “emotional Latina,” the “stoic Native American,” and the dangers of “white women’s tears.” The second half of the day was dedicated to how women can come together as agents of change by engaging in the *real, hard work* of transformation that required addressing women in competition, the burdens of leadership, and concerns about whether women colleagues can be trusted in tough times. Finally, our attention turned to building bridges, creating a new paradigm, new lexicon, and new agreements to establish sisterhood with the women in the room and the women on our campuses and at our workplaces. Participants were then tasked with building an actual physical bridge (described in detail, below). This was a testament to the transformational effects of the work the women had done across the two days. Day 2 wrapped up, as did Day 1, with a sand ceremony in which the women declared their commitment to working together to use the tools of sisterhood to advance women in STEMM.

Applications of Theoretical Framework

The areas of self-knowledge targeted vary according to the racial and ethnic identity of the participants. All of the women have had the experience of functioning in fields where they are underrepresented by sex. Research on intersectionality reminds us that all of the women, by

virtue of their profession at least, and perhaps class or other characteristics, share some degree of privilege. The white women have a level of racial privilege not afforded the women of color, whose identities include African American, Latina, Native American, and East Indian backgrounds. Some women who did not fit the historical Black-White racial divide, such as those from East Indian descent, expressed frustration with finding their place in the sisterhood noting that, “white women do not consider them ‘white,’ and Black, Latina, and Native American women don't know what to consider them.” Thus the women’s self-exploration was both individual and group specific, related to their individual experiences as well as to intragroup dynamics. Intergroup dynamics were also an important arena for discussion and discovery.

The history of relations between the different groups also played a role in the conference design. In light of the 100th anniversary of the passage of the 19th Amendment which gave women the right to vote in 1920, both groups discussed celebrated the historical achievement of that moment. We also acknowledged that U.S. women’s rights movements have long struggled to deal with race and class [11]. In that respect, then, women of color and white women engaged the significance of the same historical fact in somewhat different ways. Likewise, each group discussed the challenge posed by white fragility, which became an important part of the dialogue of the conferences, along with an understanding of how internalized oppression can push women to see other women solely through the lens of competition rather than cooperation, decreasing the likelihood of working together for change.

In summary, the following areas of research are incorporated into the construction of the conferences. Details on how research is translated into practice will be discussed in the next section.

- 1-Application of problem solving skills as social skills
- 2-Using those skills to build resilience
- 3-Using resilience to aid in the process of increasing self-understanding
- 4-Using self-understanding to honestly examine relationships across differences, including racial, ethnic, and nationality
- 5-Building a bond of sisterhood among participants, thereby creating a networked group of change makers

The Conference

Before the two day conference began, participants were asked to engage in some preparation. Not only did these resources provide all of the participants with a shared knowledge base, they also helped shape the daily agenda and informed the prompts used to evoke discussion. We asked participants to read and reflect on the following materials:

- Breines, W. (2006). *The trouble between us: An uneasy history of white and black women in the feminist movement*. Oxford University Press.

- *Presumed Incompetent "Networks of Allies"* (Chapters 15-19). y Muhs, G. G., Niemann, Y. F., González, C. G., & Harris, A. P. (Eds.). (2012). *Presumed incompetent: The intersections of race and class for women in academia*. University Press of Colorado.
- *Presumed Incompetent, "Lessons from the Experiences of Women of Color Working in Academia"* (Chapter 30). y Muhs, G. G., Niemann, Y. F., González, C. G., & Harris, A. P. (Eds.). (2012). *Presumed incompetent: The intersections of race and class for women in academia*. University Press of Colorado.
- *Reflections on Women and Race*, Leslie Traub, featuring Dr. Johnnetta B. Cole, Allison Manswell, Rosalyn Taylor O'Neale, Kimberly Rattley, Allyson Dylan Robinson, and Minjon Tholen with Nyki Caldwell
- *White Fragility*, Robin DiAngelo, <http://libjournal.uncg.edu/ijcp/article/view/249>

The White Women

For the white women, the discussion began with sisterhood. Discussion was held around whether the women of color would welcome sisterhood with the white women. The discussion then morphed to inclusivity, how white women and women of color each have to fight to have their voices heard in STEM. From there the discussion proceeded to ally-ship and the role that white women can play as both beneficiary and casualty of privilege.

The conference facilitators acted as both listeners and provocateurs, balancing the mood of the room and keeping discussions productive. If a thread seemed to be moving in the direction of complaint or self-pity, the moderators would redirect. There were instances where feelings became high, and participants were reminded that they had committed to participating in "brave space" where feelings might be hurt, but all promised to remain engaged in the conversation. This became important when discussion turned to the history of women's rights and race relations. The group expressed a desire for meaningful change, which was a shift in the tenor of the room. It was noted that, frequently, white women don't know the history of relations between white women and women of color, because privilege has shielded them from it. (Recall that all of the participants and facilitators are white women. The facilitators, and some of the participants, had varying levels of experience in diversity and inclusion work.) An example of this ignorance was cited in the lack of knowledge that white women were half of all slave holders, and that adding to this the intersection of science resulted in the story of Henrietta Lacks. This historic ignorance (and the mistrust it produces in communities of color) is duplicated in many programs. Having honest conversations and self-reflection is a step toward addressing this "elephant in the room."

The group concluded with a discussion of *White Fragility* and how women of color are frequently asked to do the emotional work of educating white women. The final discussion of the day resulted in the following to take to Day 2 and share with the women of color:

- What if I want to know, but I don't know that I don't know?

- What can we ask, and when does it become emotional labor?
- We know that we carry a fear of offence that inhibits our own learning.
- Is “how can I help” even the right question, or is it an assertion of power dynamics?

The Women of Color

The Women of Color began with discussion around how women treat each other in professional work spaces. Participants were invited to share instances when a woman has helped with professional advancement and when a woman had betrayed them. This question then launched small break-out groups where discussion continued about societal stereotypes such as the strong black woman, the stoic Native woman, and so on. Small groups discussed what it means to be the “lonely only” woman of color in leadership, the burden of taking a stand for oneself or others and not being supported, strengthening the bonds of sisterhood and trust between women of color, and how professional demands can push women of color to adjust hairstyles and clothing in ways that affect their relationships with friends and family. For the women of color, the “elephant in the room” was how they might internalize or reinforce the prejudices forced upon them by white societal norms. After the baseline topics, discussion moved to topics such as white fragility (White women’s tears are the most powerful force. How do we approach/handle “white fragility”?) and “From Hurt to Healing, Loving Ourselves.” The day concluded with preparation for Day 2. The women of color concluded that:

- Women of color may be more familiar with sisterhood than white women, but still have to work to overcome differences, for instance, in nationality, skin tone, and age
- Women of color need strategies on how to handle white fragility in ways that do not require that empower “white women’s tears” nor pull away from collaborative opportunities
- Women of color need to explore ways to “bring their whole selves” to the workplace for the sake of their own health and to create pathways for younger women who are just beginning
- Women of color and white women need to develop authentic ways of communicating and ways of working together that more equitably share the risks and the rewards

Coming Together

The joint conference occurred on Day 2 for seven hours. There were joint facilitators for Day 2, both white women and women of color. Cultural instances, such as spoken word poems with African drums and Native American songs, were used to bring focus throughout the day. The morning consisted of sharing from the previous day and resultant discussion. Several women, some from each of the two groups from the day before, were asked to share their stories of how they connected with the previous day’s conversation. These stories engendered a great deal of conversation, questions, and some challenging questions. Moderators intervened in the discussion only to keep it moving. Participants were expected to engage conversations authentically and honestly. In the midst of animated voices and laughter, there was also some

anger and even tears. Participants responded to individuals being challenged in some unexpected ways. For example, sometimes participants intervened to redirect a conversation in a more inclusive or healing direction, while at other times participants helped the discussion to proceed through very difficult points. This process brought to light misconceptions held by each of the groups about each other and about themselves. If participants felt threatened or anxious in any way – physically or psychologically – by the challenge or problem they were asked to complete, they were afforded the opportunity to opt out of the activity for a period of time until they were ready to rejoin. While an individual might temporarily become a process observer, everyone was invited to remain in the brave space that had been established, where mistakes could be made and welcome would be extended. This dynamic allowed participants to transition to the “elephant in the room,” that is whether and how women of color and white women could develop a sisterhood, and why doing so might be worth the effort. The participants were encouraged to participate despite their discomfort, because risk-taking is an important aspect of leadership, and leaders need to be willing and able to work outside of their comfort zones. On the whole, the process was very successful in opening both hearts and minds, even of attendees who were very experienced in diversity and inclusion efforts. In doing the work of building figurative bridges to one another throughout the day, the women learned tools and modeled behaviors to take back to their campuses and office buildings.

We considered the role of anger in the workplace and how anger is understood differently for men than for women, and for white women than for women of color. The conversation turned to: What does an angry white woman look like? And, what does an angry black woman look like? The idea here was that, in the workplace, angry black women are often perceived very differently than angry white women. We discussed the possibility that white women allies should practice being angry more often, and sometimes on behalf of women of color. A white woman ally could speak with women of color and, after some consultation, on behalf of women of color, in ways or in rooms that a woman might not be able to do. The discussion concluded with asking, “How can we leverage our anger on behalf of our sisters?”

Building Bridges: An Exercise that Shows How Sisterhood Facilitates Problem-Solving

As a conclusion to the afternoon, participants were asked to construct a physical bridge. The white women and women of color— who had been working together all day— were once again separated into two groups and instructed to go to separate areas in the same large room. Each group received a set of materials prepared by one of the facilitators. Participants were told to build half of a bridge so that when it was combined with that of the other group, the two halves would meet and span a five foot gap. Each group were deliberately provided different items. Both had materials with greater length than width, like craft sticks and straws; with flexibility, like string, yarn or pipe cleaners; and, materials that would serve purely decorative purposes, like a string of battery powered lights and stickers. One team received scissors, and the other received tape. Both teams received paper of some type.

Each team was allotted 20 minutes to build. The facilitators observed and answered questions, but did not participate. Based on previous experiences of one of the facilitators who routinely used this exercise in first-year undergraduate engineering courses, our baseline expectation was that the teams would work independently on their bridges, assuming that everyone had that same set of resources and not inquiring about what resources the other team possessed. Because of the lack of coordination, which we might conceptualize as trust, we expected the two teams' bridges to come up short when they sought to cover the 5-foot gap. Our task would then be to discuss how sisterhood would help the participants bridge this remaining gap. In the two conferences where the bridge activity was used (DC and Dallas), two different behaviors were observed.

At DC Building Bridges, the process followed a generally expected pathway in the beginning. The teams oriented themselves to the task, negotiated which members had more experience with this type of activity, and began to plan. About ten minutes in, however, the teams came to a realization that they were going to need information from the other group to succeed. Rather than operate in isolation as the facilitators expected based on past experience, the teams sent emissaries to each other to ask questions. When they realized that one team had tape and the other had scissors, they decided to share their resources, combine their designs, and create an entire bridge together. In other words, the two groups seemed to be differently equipped than random students in a classroom. The women were open to the possibility that not everyone had received the same resources. They were also confident enough and trusting enough that they sent a group representative to inquire with the other group. Instead of only focusing on competition, they sought ways to collaborate. The facilitators are intrigued by this unexpected outcome. We attribute it to the transformative power of sisterhood. When women learn the tools of difficult and honest conversation, and learn to trust each other more, it can influence and improve problem-solving strategies and outcomes. In other words, sisterhood practices can be transformative. The results varied some in the Dallas Building Bridges conference. Here, various team members had the impulse to go to the other team to inquire about their resources, but were called back by their teammates. Each team built their own bridge half separately (as we had expected in DC). Interestingly, without coordinating, both teams added an extension to their own bridges designed to be affixed to the bridge half of the other team, sized by observation only. This suggests that although the women did not allow coordination as they did in DC, this group did anticipate the needs of the other team and sought to accommodate potential deficiencies in design by adding material to compensate for shortcomings.

There were two major differences between the two bridge building teams at the two conferences: At DC Building Bridges, the teams were larger, separated into their Day 1 groups, and most had participated in two full days of work. The Dallas Building Bridges group was relatively smaller, with more women who had not attended the first day. The Dallas group did not return to their Day 1 groups. This led the moderators to speculate that there might actually be some interesting observable behavior phenomena in the activity, rather than it being only symbolic and team building. This is an area for future work and case study. The pictures below show bridges from two of the conferences.



Figure 1: Bridges from Washington, DC and Dallas, TX workshops

Assessment

Each participant received a 13-15 question pre-test at the start of the meeting, along with a gift box that included a pen, pad, vial of colored sand, and a piece of chocolate. Each box was given a unique number, which participants used in lieu of their names on the pre and post

surveys. This allowed for facilitators to match pre and post surveys at a later date. There were approximately 20 white women on Day 1, and 30 women of color. We received 17 pre-event surveys from white women and 24 from women of color. Participants were also asked to complete a post-event survey at the end of Day 2. We received fewer responses for the post-event survey than for the pre-event one. Here, we present an overview and some preliminary analysis.

Pre- and Post-Event Surveys

The survey instruments shared some questions for both the women of color and white women, and some were different. Following are some examples of shared questions from the survey instruments. This set of questions was presented with the exact same wording to both groups.

Briefly describe what the following words mean to you using any framework that comes to mind:
a. Sisterhood b. Diversity

In what ways are you advantaged/disadvantaged compared to others? Consider your professional and personal life, your upbringing, societal advantages, and so on.

What do you want to learn from this conference?

A series of Likert-scale questions were also asked of both groups. All answers shared the same scale for responses: All, Most, About half, Some, None, Don't Know.

One of the goals of this workshop is to consider ways of building meaningful relationships with other women. Thinking of your relationships with women to whom you are not related:

- a. *What share of your meaningful relationships are within groups you already identify with in terms of race, ethnicity or culture?*
- b. *What share of your meaningful relationships are across racial, ethnic, or cultural groups?*
- c. *In what share of your personal social gatherings do you invite women of color/white women? (i.e. dinner at your home, social events, NOT including work events).*

An additional set of questions asked the women about how they felt about the potential of working with other women allies across racial, ethnic, and nationality differences. Answers ranged from: Agree strongly, Agree, Disagree, Disagree Strongly, Don't Know.

It is important to improve relationships between white women and women of color.

White women and women of color have a good history of working together.

Another set of questions asked the women their feelings about their own ability to speak up for themselves or on behalf of other women. Many of these questions had different wording for women of color versus white women.

For women of color:

White women colleagues have publicly used their voice to advocate for you.

You feel like it is always up to you to point out micro-aggressions that someone is experiencing.

For white women:

Your voice is not strong enough to stand up as an advocate for women of color.

You are comfortable speaking up when you see a situation that may indicate bias against a group that you don't personally identify with.

Both women of color and white women:

You have been in a situation where a white person/person of color misunderstood something that you said or did as being insensitive or racially motivated.

Results and Analysis

Sisterhood

Women of color and White women used similar language to describe sisterhood. Both groups described sisterhood as bonding with and supporting other women. The results show that the two groups valued these two attributes of sisterhood, differently, however. One third of women of color viewed sisterhood as women supporting other women. In fact, support was the top response for women of color. While support was in the top three for white women, just shy of 20% of white women saw support as an important feature of sisterhood. For white women, 23.5% reported bonding was most important, while bonding came in the last of the top three for women of color at 14.9%.

Diversity

Difference was the most likely response for both white women and women of color when they were asked to describe what diversity means. Difference or different came to mind for two-thirds of the women of color and 41% of white women. Both groups considered race, background, culture, and sex in the range of differences they considered. White women mentioned race in 29% of their responses while 24% of women of color did so.

Advantages/Disadvantages

Both groups were asked: *In what ways are you advantaged/disadvantaged compared to others? Consider your professional and personal life, your upbringing, societal advantages, and so on.* This question revealed quite a few similarities in terms of how white women and women of color view advantages in their own lives. The women's advantages accrued from education, family, money/wealth, middle class status, and having college educated parents. Education was the viewed as an advantage by both sets of women, 47% of white women and 43% of women of color. More white women than women of color mentioned family as a source of advantage professionally or personally, 47% of white women versus 24% of women of color. A smaller

share of the women identified their class status as an advantage, 18% of white women and 14% of women of color.

Women of color described education as their as their primary advantage. Family, college, socio-economic status and wealth were other listed advantages. Middle class status and having two college educated parents were considered advantages by women of color. The intersectional realities of being both black and female were listed at their primary disadvantage, while being poor and first generation college were also identified as disadvantages.

White women recognized being white as their main advantage. Together, education, family, and money/wealth accounted for more than forty percent of the advantages that they identified. They describe their primary disadvantage as age, which may indicate something about the group that self-selected to attend the conference. Being overweight was another commonly stated disadvantage.

The women identified only one commonly shared disadvantage: sex/gender. Both white women and women of color identified being female as a source of disadvantage with more women of color doing so, 24% versus 18%. Race played a curious, but not unexpected role in the women's descriptions of advantages and disadvantages. White women were somewhat more likely to mention race in their responses to this question than women of color, 29% compared to 24%. A large majority of white women, nearly two-thirds (65%), identified being white as a primary advantage, while race was more often identified as a disadvantage for women of color, but for a significantly smaller share of women, 24%. White women were also more likely to list being a first-generation college student as an advantage while women of color were more likely to see being the first in their families to attend college as a disadvantage.

Meaningful Relationships with other women

Both white women and women of color indicate that their meaningful relationships are mostly with people of their own race, ethnicity, and culture. Nearly three-quarters of white women and two-thirds of women of color reported that most of their meaningful relationships were with people sharing their own background characteristics. Two-thirds of the women of color reported that half of their meaningful relationships were people outside of their own racial, ethnic, or cultural groups, while 53% of white women reported that some of their meaningful relationships were outside of their own groups. Large margins of white women and women of color report some meaningful relationships with people from outside of their own personal racial, ethnic, or cultural group at personal social events, 64% and 62%, respectively.

Improving Relationships between white women and women of color

Both women of color and white women agreed that it was important to improve relationships between both sets of women. Almost 95% of white women agreed strongly with this statement,

while 62% of women of color did. Both white women and women of color disagreed by wide margins that the two groups have a good history of working together. Nearly half of white women disagreed with that statement, 47%, while 62% of women of color disagreed.

Using Your Voice

Most white women, 65%, reported that they did not feel that their voice was strong enough to advocate for women of color, but greater than 70% felt that they would speak up for women of color when needed. Two-thirds of the women of color reported that white women colleagues had publicly used their voice to advocate for them. Both white women and women of color reported had something that they said or did misunderstood as insensitive or racially motivated, 59% and 43%, respectively.

Learning from this Conference

Women of color and white women did not exhibit many similarities when it came to what they hoped to learn from attending the conference. White women wanted to learn more about diversity, while women of color wanted to learn how to support and understand one another.

Post-Event Survey Results (White Women)⁴

Because the pre-test was focused on identifying ideas and beliefs that the women had, as well as ways they hoped to work together, the post-test presented some different questions. Asked to identify the three most meaningful ways in which the conference had expanded their views, white women reported new ideas about sisterhood, how to be an ally, and techniques for meaningful advocacy as their top three responses, each scoring over 50%. Understanding the power of your voice was identified in 41.67% of responses. Other categories such as an increased understanding of transparency and vulnerability, privilege, and white fragility all appeared in 25% of surveys. When asked to briefly describe some ways that their view had changed, the white women identified a need to ask women of color more questions to gain insights. Asked to identify tools to help women work together toward meaningful, transformative change, white women identified listening as the primary tool. When asked to identify personal barriers that they confronted during the conference, white women cited lack of understanding as the most common barrier.

Moving forward, white women stated that bringing information back to their professional society as a method to continue the dialogue begun at this session. Listening was a step that white women can take to be a better ally to women of color in their personal life. There was no common theme amongst white women and how they can be a better ally to women of color in their professional life. There was no common theme on how to create a safe place for women of color at their institution to raise concern. This indicates a need for the group to continue to work on these issues.

⁴ The post-event surveys from women of color is still in process at this time.

Discussion

The preliminary results presented above indicate that women of color and white women both see opportunity for and potential benefit for working together in sisterhood to transform STEMM in the academy and industry. These results also indicate areas where the potential for relationship building is fragile and could use some reinforcements. White women and women of color think that working together would be productive, but both groups acknowledge a rocky historical record of alliances across lines of cultural or racial and ethnic difference. Women of color and white women value sisterhood, but they approach sisterhood differently with white women seeking bonding with other women while women of color seek more support in navigating the workplace. Both groups recognize that being a woman in male-dominated fields puts them at a disadvantage, and beyond that, both groups see the many of the same sets of experiences as advantageous; however, as expected, white women and women of color experience race very differently in their professional lives. Both groups report being in at least some meaningful relationships with women outside of their racial, ethnic, or cultural groups, but white larger shares of white women prioritize improving relationships between the groups than women of color do, indicating some reluctance or skepticism on the part of women of color.

Based on the experiences of the facilitators, written and in-person responses from participants, and follow up discussions, there is a great deal of potential to be realized from taking a more grounded, interpersonal approach to strengthening connections between white women and women of color as a means of transforming STEMM. Our conferences has demonstrated promising results for sisterhood as a framework for disrupting existing patterns of leadership, resistance, and change in STEMM. Put differently, we suggest that STEMM can be transformed on both large and small scales by introducing sisterhood as an tool for change, modeling how to have difficult conversations and confront the “elephants in the room,” reconceptualizing individual strengths, and helping women to see other women as allies, notice who is missing from the table, and elevate other women. At its most basic, women coming together to support one another will have transformative effect, however, it is not simple nor easy, and neither wishing nor mere goodwill will make it so. Instead, what is required is a willingness to go beyond safe spaces to brave spaces where women of all backgrounds commit to seeing each other, advocating for each other, and upholding one another up in our professional and personal lives with the objective of fundamentally transforming the work and production of STEMM and related fields. Building Bridges is a program unlike any other in current landscape of diversity and inclusion offerings. Inspired by the transformative work of the 2 days of discussion and practice, along with effects of sisterhood (trust and improved problem-solving) on building a physical bridge, women leave this conference prepared to see and do differently and engage women with more intentionality upon their return to the workplace.

Overall, the white women rated the session as excellent.

Some selected comments from the post survey are listed below.

- This was a great two-day event. I really like the smaller group conversations.
- I thank you from the bottom of my heart!

- I look forward to next year's event.
- Excellent-- NSF or someone should fund!!!
- [I look forward to] supporting my sisters in expressing their brilliance and receive support in mine.
- I can be more aligned with my purpose.
- I can support and be supported by women of color in STEM.
- I'm so excited to learn about how to better support each other in STEM and how to build a community that leverages each other's capabilities.
- [I look forward to] building a great supportive network of like-minded women.
- Deeply connect and slow down so I can be even more intentional about my connection to my sisters in this world.
- Heal past hurts.
- If we are to succeed, we must make sure white women truly understand and meaningfully support women of color in a genuine way.
- We can support one another; stronger together.
- We all are women and can learn from one another. We all bring different things to the table, and our collective gifts carry immense power.
- Learn about one another's unique challenges, cultures, experiences.
- Be supportive not only emotionally, but professionally. We need to advocate for each other in ways that will help.
- Engage in more meaningful conversations with women of all cultures.
- Be more open, inviting to women of color with different cultural backgrounds.
- Talk, listen, tell stories; narratives break through to shared truths.

A Plan for Going Forward

Conferences are planned for locations across the country, including Raleigh, NC, West Lafayette, IN and others. In addition, the growing network of women will be engaged to ensure that the need for a networked group across the country is fulfilled. The most urgent need to support the continuation of the conferences is consistent funding. To date, each conference has been funded by small participant fees and an assortment of highly localized funding partners. The increasingly significant success of the conferences should make them of interest to national funding partners.

More research will also continue to be done on several aspects of the conferences, notably the use of the bridge activity to determine aspects of growth that are not discerned through more conventional assessment measures.

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