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## Expanding the Landscape of Opportunity: Professional Societies Support Early Career Researchers Through Community Programming and Peer Coaching

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### Abstract

Weaving the future of the field of Comparative Psychology is dependent on the career advancement of early career scientists. Despite concerted efforts to increase diversity in STEM, scholars from marginalized groups are disproportionately underrepresented in the field - especially at advanced career stages. New approaches to sponsorship, mentoring, and community building are necessary to retain talent from marginalized communities and create a culture and system where all individuals can thrive. We describe the unique and supportive role senior women scientists united through a professional society in initiating peer coaching circles to facilitate the success of a diverse cohort of early-career women scientists. We offer our experiences with the Weaving the Future of Animal Behavior program as a case study that illustrates the cascading impacts of professional societies investing in the success and career development of marginalized scholars. We focus on our peer coaching circle experience and share the products and outcomes after two years of meeting. Peer coaching transformed us from a group of loosely organized, anxious individuals into a collective of empowered agents of change with an enhanced sense of

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belonging. We end by presenting recommendations to institutions seeking to expand the landscape of opportunities to other marginalized scholars.

### Keywords

peer coaching; women; marginalized people; early career researchers; career advancement; STEM education

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Ingenuity and innovation in the academy hinge on the recruitment, retention, and advancement of women and minoritized scholars in academic careers and leadership. Women and minoritized people have made considerable contributions to comparative psychology, yet their inclusion and promotion in the academy lags behind their representation in the general population. Marginalized scholars are less likely to advance academically than their majority colleagues who are of comparable seniority (Pickett, 2017; Stevens et al., 2021), in large part due to factors such as social isolation, disparities in network access, inequitable institutional support, disproportionate service requests, citation biases, funding gaps, pay disparities, lack of retirement and other benefits, family obligations, motherhood penalty, job insecurity, frequent relocation stress, competitive job markets, gender-biased discrimination, racial inequities, interpersonal factors, minority tax, and lack of mentoring (Brown, 2017; Campbell & Rodríguez, 2019; Chatterjee & Werner, 2021; Feldon et al., 2015; Isler et al., 2021; Jimenez et al., 2019; Kricorian et al., 2020; Lambert et al., 2020; Munton, 1990; Nauman et al., 2020; NPA Advance, 2011; M. Ong et al., 2018; Rodríguez et al., 2021; Taffe & Gilpin, 2021; Wang & Ackerman, 2020; Winkle-Wagner, 2009; Witteman et al., 2019). Simply acknowledging and raising awareness of these biases and disadvantages is insufficient in mitigating their adverse effects. To truly address recruitment, retention, and promotion of women and people from minoritized groups, effective institutional action that provides support and promotes career advancement is critical (Taffe & Gilpin, 2021). Most commonly, this action takes the form of (1) career development via sponsorship or (2) diversity initiatives. Although each of these can help, relying on just one, or even both, for institutional actions can still fall short. As we show here, integrated, long-term professional society efforts can provide impactful support and opportunities for early career researchers.

Addressing the loss of talent requires interventions at early-career transitions. Losses of women and minoritized scientists in the life sciences occurs most during the transition from grad-postdoc and post-doc to faculty phase (Lerchenmueller & Sorenson, 2018). Women and men are at near parity at the postdoc level, and women even dominate in representation at the graduate level in psychology and life sciences (Lautenberger et al., 2014; NPA Advance, 2011; Shen, 2013; US National Science Foundation (NSF), 2019). Despite these advances in representation at younger career stages, women hold only 40% of assistant professorships and no more than 30% of associate professorships in the life sciences (Jena et al., 2015). Similarly, the representation of Hispanic, Black, Native Hawaiian, and Alaskan Native scientists drops at least 74% during the transition from graduate to postdoc and postdoc to faculty phase (US National Science Foundation (NSF), 2019). According to the 2019 NSF survey of science doctoral students, only 10.9% identified as Hispanic or

Latino, 5.9% as Black, 0.5% as American Indian, 0.1% as Native Hawaiian or Other Pacific Islander. At the postdoctoral level, only 2.9% identified as Hispanic or Latino, 1.7% as Black, 0.1% as American Indian and 0.1% as Native Hawaiian or Other Pacific Islander. That is, the majority of losses of women and marginalized people occurs during a span of 0–10 years post-PhD. Professional societies may help address the hemorrhaging of women and diverse talent during these sensitive transition periods.

Professional societies and the senior members of these societies can enhance the career development of early career scientists through concerted and continuous sponsorship. Sponsors are influential decision makers (e.g., journal editors, program officers, executive members of professional societies, tenured faculty) that use their social, political, and economic capital to provide opportunities, spotlight proteges, open doors and advocate for the inclusion, promotion, and advancement of an individual or a group of individuals in the locales where decisions are being made (Travis et al., 2013). Sponsors amplify and elevate individuals, a key distinction from mentors that provide advice, and coaches that support individuals to find their own solutions (Travis et al., 2013). Sponsorship can support the launch of talent from budding scientists into rising-star status (Wayne et al., 1999). Although a sponsor can be transformative in helping an individual achieve success in one dimension (e.g., grant procurement) or in one stage of an individual's career, this success does not necessarily translate to achievements in other areas (e.g., career advancement, publishing). For example, 40% of Black recipients of NIH Pathway to Independence awards, valued at nearly \$1 million USD, do not activate the faculty phase of the award (Pickett, 2017). That is, receipt of a major federal grant intended to support an individual's transition from postdoc to faculty does not guarantee the transition. Thus, to navigate the multi-faceted benchmarks for academic career advancement, and the plethora of transitions that span the long trajectory from initiation into the academy until tenure, individual acts of sponsorship are often not sufficient to help an early career researcher thrive. We posit that professional societies could play an important role in ensuring that people at each career stage have the support and resources they want and need to thrive. Professional societies can provide complementary support to amplify and elevate marginalized scientists through providing venues for them to present and publish their work, secure funding, network, interact with role models and build peer coaching communities to support their continued success in the academy.

Here, we describe the transformative power of professional societies through the efforts of senior women professors in the Animal Behavior Society garnering NSF support to launch a cohort-based professional development initiative for early career researchers in animal behavior - Weaving the Future of Animal Behavior (WFAB; NSF grant 1833455; Fig. 1). First, we provide an overview of mentoring as an important form of career support, and then discuss how peer coaching networks provide synergistic and valuable support. Second, we introduce the WFAB peer coaching circles called Power of Peer Circles (POP Circles), an important component of WFAB's cohort-based professional development model. Third, we illustrate our experiences with this initiative to provide a case study on the cascade of outcomes from this initial professional society support. We share some of our POP Circle experiences and highlight the role of sponsorship from the Animal Behavior Society and the Journal of Comparative Psychology to amplify and disseminate our experiences. Fourth,

we summarize outcomes of our peer coaching experience and highlight how we leverage this work to create new initiatives. We end by highlighting opportunities for professional societies to support early career researchers.

## Beyond Mentoring in a Support Network

Much conversation about support for early career researchers focuses on mentoring. And mentoring does, in fact, matter. Positive mentorship experiences can be an important predictor of career success, satisfaction, retention, and optimism across career stages (S. Olson et al., 2021; Pfund et al., 2016). Mentorship can increase productivity, self-efficacy, and self-confidence (Estrada, Eroy-Reveles, et al., 2018; Estrada, Hernandez, et al., 2018; S. Olson et al., 2021; Pfund et al., 2016). Importantly, supportive, culturally responsive mentorship can significantly increase sense of belonging, and contribute to successful development of a scientific identity, making it more likely for women and members of marginalized racial and ethnic groups to pursue research-oriented careers (Guy & Boards, 2019; National Academies of Sciences, 2020; Pfund et al., 2016; Stachl & Baranger, 2020; Zaniewski & Reinholz, 2016). Relationships, network resources, and individual qualities play a pivotal role in the mentoring outcomes (Bozionelos & Wang, 2006; Haines, 2003; Nick et al., 2012).

Senior-junior mentor-mentee relationships (e.g., graduate student and undergraduate student, faculty and graduate student, tenured faculty, and untenured faculty) are the dominant mentoring model in academia. This type of mentoring can be impactful for professional development and gaining institutional knowledge. However, these relationships may not provide sufficient support for mentee success for a multitude of reasons (DeCastro et al., 2013; Ehrich et al., 2011; Ehrich & Hansford, 1999; Montgomery & Page, 2018; National Academies of Sciences, 2020). Senior-junior mentoring relationships may experience conflict or dysfunction due to a poor mentor-mentee match, mentor incompetence or neglect, and even boundary violations or exploitation (Johnson & Huwe, 2002). Such conflicts can be common in relationships with power differentials. Additional conflicts can arise when a mentor and mentee have different goals or differentially assess a mentee's progress toward shared goals (Feldon et al., 2015). Finally, a lack of formal mentor training, especially for faculty mentors, can decrease the efficacy of mentoring relationships (Handelsman et al., 2005; Hitchcock et al., 2017; Hund et al., 2018; Pfund et al., 2015). Training for mentors and mentees to understand mentoring limits and how to utilize interventions that leverage institutional or professional society resources could help provide safety nets for mentoring gaps. Cultural competence and anti-racist training are especially important for mentors of mentees from marginalized groups because numerous studies describe suboptimal mentorship experiences of these students at primarily white institutions. The junior individual often said these relationships were marred by racial microaggressions and overt discrimination from both faculty and peers, and ascribed depressive symptoms, anxiety, and post-traumatic responses to these experiences (Alexander & Hermann, 2016; Byars-Winston et al., 2018; Johnson & Huwe, 2002; Jones, 2014; Lewis et al., 2021; Martinez-Cola, 2020; A. D. Ong et al., 2013). Enhancing a sense of belonging may counter the detrimental impact of racial microaggressions experienced by marginalized individuals in higher education (Choi et al., 2021; Lewis et al., 2021). Even with adequate

training and clear intentions, dyadic mentoring cannot address the issues associated with power differentials or network limits of the mentor. The challenges of senior-junior dyadic mentorship highlight the need for institutional support for a more effective mentoring model.

More recently, the importance of supportive networks rather than reliance on just one or a few traditional mentors, is gaining more attention in academia as crucial for career progress and navigating transitions (DeCastro et al., 2013; Jean-Marie & Brooks, 2011; Montgomery, 2017; Sorkness et al., 2017; Termini et al., 2021). These support networks can consist of formal and informal mentors, including research advisors, other faculty, role models, coaches, peers, family, and sponsors (Griffin et al., 2018). Crafting tailored mentoring or growth networks can help center the individual's goals and needs (Montgomery, 2017; sensu Horner-Devine). These growth networks have the added advantage of extending the individual's social network, which is critical for career advancement (Jean-Marie & Brooks, 2011). Uniting these support systems can enhance the network and a sense of belonging.

### **Peer Coaching Circles Expand the Mentoring Landscape**

When peers mentor and coach each other, participants can form community connections through shared experiences (Dyer-Barr, 2014; Gold et al., 2021; Horner-Devine et al., 2018; Rockinson-Szapkiw et al., 2020, 2021; Thomas et al., 2015). These support networks can provide emotional support, career advice, and a safe protected space. In STEM, peer support networks can also help participants develop STEM identities, self-efficacy, and persistence in the face of challenges (Gold et al., 2021; Rockinson-Szapkiw et al., 2020, 2021; Thomas et al., 2015). By connecting with peers with shared personal and professional identities and goals, peer mentoring and coaching support the development of a scientific identity that resonates with personal experiences and that does not undermine other aspects of an individual's identity such as culture, race, gender, or ability status (Horner-Devine et al., 2018; Jackson et al., 2016; Luedke et al., 2019; National Academies of Sciences, 2020; Nealy & Orgill, 2020). Importantly, these support networks provide strong social and cultural capital, which (1) enhances the ability to mobilize resources and adapt to different social and academic situations, and (2) enables group members to make institutional change, thus, increasing the chances of success in STEM fields (Gold et al., 2021; Luedke et al., 2019; National Academies of Sciences, 2020; Rockinson-Szapkiw et al., 2020, 2021; Thomas et al., 2015). Peer coaching circles are especially beneficial for women of color in STEM and can create a supportive environment that addresses unique and shifting challenges for women in the sciences (Gold et al., 2021; Horner-Devine et al., 2018; M. Ong et al., 2018; Rockinson-Szapkiw et al., 2020, 2021; Thomas et al., 2015).

### **WFAB and Cohort-based Professional Development**

The coauthors of this manuscript are a group of 9 early career researchers in animal behavior who met through a shared experience with the WFAB program over multiple days. The additional author, Dr. Claire Horner-Devine, designed and facilitated the WFAB professional development model based on her previous experience with cohort-based professional development program for early-career scientists and engineers. Importantly, three senior women (Emília P. Martins, Jennifer H. Fewell, Zuleyma Tang-Martinez) in

Animal Behavior served as the initial sponsors for all this work as they identified the opportunity, connected with Horner-Devine as the program design and facilitation expert and garnered NSF support necessary to launch and develop WFAB. Here Dr. Horner-Devine shares some context for the WFAB professional development model and introduces the peer coaching circles. Subsequent sections of this paper feature the voices and experiences of the other co-authors and how, as early career researchers, they engaged with and were impacted by the WFAB model and then how they leveraged their increased sense of belonging to become empowered agents of change and initiate a series of community-based initiatives.

The overall goal of the Weaving the Future of Animal Behavior (WFAB) program is to advance the future of animal behavior science by supporting and promoting community and professional development for early career professionals. Here, we introduce two components of the WFAB program - an in-person multiday professional development symposium and regularly meeting peer coaching circles - and focus on the latter. The WFAB program also includes an annual research symposium featuring early career researchers with a WFAB community-defined research focus and an annual one-day interactive workshop for early career researchers preceding the annual Animal Behavior Society meeting. We do not discuss these program components in detail here as they are beyond the scope of this paper.

The inaugural WFAB symposium took place in the Spring of 2019. Adapted from previous work in other STEM areas, WFAB began with a multi-day, in-person, interactive symposium for 30 early-career participants (i.e., postdoctoral scholars and pre-tenure faculty members), during which participants engaged in community building and skill development through an immersive, interactive workshop experience (Carrigan et al., 2018; Horner-Devine et al., n.d., 2016, 2018; Margherio et al., 2016; Yen et al., 2017). During the symposium, participants were introduced to a peer coaching circle model, called POP Circles (Daniell, 2006; Horner-Devine et al., n.d., 2017, 2018). Following the WFAB symposium, WFAB were invited to join year-long POP Circles so that they could continue to develop relationships and connections, engage with their own professional development and develop their own coaching skills.

### Peer Coaching Circles

We, the 9 co-authors, now describe peer coaching circles and the program from our perspective. Power of Peers Circles (POP Circles) are peer coaching circles that are run by and for a small group of peers. Each POP Circle has 5–9 members who meet every other week for up to 90 minutes to engage in a structured peer coaching experience. Central to the success of the POP Circles is that all participants are true peers who choose to take part in the circle. No one person is more senior or viewed as an expert relative to the others. Further, from the first meeting of the POP Circle, expectations, and agreements necessary for impactful peer coaching and a supportive group dynamic highlighted the importance of confidentiality, active listening, and the practice of non-judgement. Horner-Devine or other trained role models joined the first three meetings of the POP Circle to help set the tone, guidelines and format of the model as well as to teach the participants peer coaching skills. After the third session, the group continued to meet every other week on their own. In what follows, we share 1) our experience with the POP Circle mechanics; 2) the impact of the

POP Circle experience on us as individuals and as a group; and 3) how we adapted the POP Circle model as a vehicle for social impact.

### **Our experience with the POP Circle mechanics**

The mechanics of each POP Circle session followed a defined and regular structure that allowed each participant to have focused individual work time and serve as a peer coach as well. Each person was allocated 10 minutes of dedicated ‘work time’ during the session where they briefly summarized the progress they made on last meeting’s contract (see below), before outlining a current issue or topic they wished to work through. It was then the turn of the other POP circle members to ask questions that helped them: 1) understand the issue posed, 2) familiarize with the steps that the focal member has tried so far to deal with the issue, and 3) clarify what kind of input they wanted. The fundamental purpose of these questions was to help the focal member to clarify their thoughts and direction on the issue. At the end of their ‘work time’, the focal member then articulated a ‘contract’, an achievable, proactive action or set of actions they commit to taking before the next meeting. At times, individuals did not have an issue to discuss and preferred to present an accomplishment or could opt out of sharing and instead offer support to others. This flexibility in topic choice and involvement allowed individuals to embrace their current state and comfort while continuing to contribute to the circle.

In addition to taking turns to either work through their topic or ask questions, during each meeting three people took on one of three main roles: the facilitator, the timekeeper, or the notetaker. The *facilitator* kept the meeting moving, asking people to volunteer in turn to speak. The *timekeeper*, as the title suggests, kept track of the ten minutes allocated to each POP circle member and gave a signal at the 8-minute mark to indicate the focal person should begin to formulate their contract for the following two weeks. The *notetaker* summarized the general themes which emerged over the duration of the meeting (e.g., general transitions in jobs or life, navigating relationships, etc.), presented these back to the group at the end of the meeting, and then shared the summary via email with all group members. Group members cycled through these roles from one meeting to the next.

### **Group Values, Core Tenets, and General Expectations**

Our sustainable supportive group dynamic has rested on three fundamental pillars: confidentiality, active listening, and practice of non-judgement (Fig. 2). From the start, confidentiality has been a core tenet of our meetings. A commitment to keep discussions within the group and not share details with others or in any written form has been key to building trust and allowing each of us to be vulnerable and honest. A second key aspect of POP circles has been that those not doing their 10 minutes ‘work time’ listen actively. We limit ourselves to only asking questions of the person doing their work time, with the goal of helping them work through their issue and help achieve clarity about next steps. This is a critical feature of the POP circle dynamic, where the job of the listeners is not to offer suggestions or ‘fixes’, but to help the focal individual work through issues. From our experience, asking only questions and not suggesting solutions takes some practice but is an invaluable skill to develop. To help with this process, group participants were encouraged to reflect on both why they *were* talking (especially for very vocal participants) and why they

were *not* talking (especially for participants not interacting as frequently). The third value that has been a crucial pillar of our POP circle has been a focus on minimizing judgement, both of ourselves and each other. As a group, we were encouraged to gently call each other out on statements we made during our work time which reflected fixed mindsets, internal preconceptions, self-sabotage, or elements of imposter syndrome. As peers and early career researchers at precarious career stages, it has also been important to be aware of competitive or otherwise judgmental feelings that may arise when listening to each other. Taking time to reflect on these emotions, and if necessary, taking a break from the session, was encouraged from our first meeting.

## Impacts of Our Peer Coaching Circle

In our experience, our peer-to-peer coaching circle had an outsized positive effect on all of us that was surprisingly large in magnitude, especially given our initial expectations and previous experiences with mentoring groups. On the qualitative side, we all report feeling an increased sense of belonging, the development of a strong “sisterhood” support network, and increased access to advice, resources, and support systems which we share with each other. Having a peer coaching circle allowed us to discuss and define individual strategies that assisted the navigation of complex career transitions such as promotions, starting new jobs, grant writing, and using expertise in animal behavior to move to careers in industry or NGOs.

Consistent with the published literature on peer-coaching fostering a sense of community (see above), individuals in our group identified positive changes in feelings about our circle over time (Fig. 3). We used an exercise where we wrote single words that represented our feelings and experiences during our initial meetings (about first 8 months after the WFAB program) the meeting and current meetings or after 21 months in the POP Circles to create word clouds. Words clouds generated from reflection notes about the first 8 months, illustrate that many of us were feeling vulnerable in early-career (postdoc and pre-tenure) positions, anxious about the variety of professional and personal challenges we faced, and hesitant about the value of peer coaching. Additionally, many of us were uncomfortable talking with new colleagues about these feelings and challenges, and the circle structure felt rigid and unnatural. However, as we kept meeting, we gained more professional confidence from discussing our challenges and completing our associated contracts and developed a sense of familiarity with and trust in our peers. After 21 months, our circle felt genuinely like a supportive community where we could get thoughtful questions that would cause us to think deeply and critically about our current situations that furthered strategic action that centered our needs. We felt a greater sense of belonging in our circle and in our academic field and looked forward to spending time with friends who uplifted us personally and professionally.

Reflections from members of our POP Circle illustrate how the POP Circle served as a form of important personal and professional support that manifested collective action:

“Instead, I feel a sense of belonging that is more enduring than I have had before in academia – it doesn’t really depend on my current research focus, or latest paper,



or position, or status, because I could be anywhere doing anything and y'all would be fine with it... Even as we work toward projects and collaborations outside of ourselves, I still value those meetings where I think of our format as “constructive venting”: feeling heard, supported, and confirmed in our lived experiences, but paired with concrete steps to take control of our situations.”

“My current feelings about our POP Circle group are that we have formed a really solid bond of trust and respect. I feel like we are a partnership to help, promote, and uplift each other. While we do spend time on each person’s challenges, we’ve also started to look outwards to see how we can, as a group, positively impact others.”

“I have found a group of scientific colleagues that show absolutely no judgement, are accepting of our different paths, and are entirely devoted to supporting each other through our own respective trajectories. More than that, we are willing to put ourselves out there and work to be agents of change, so that generations that come after us have a different experience. Today, I use the moments I have with this group as moments to recharge energy, to renew my hope and to find the best ways to keep moving forward. I am grateful and honored to be part of such an amazing group of human beings.”

### **Adapting our POP Circle for Social Change**

At the one-year mark, in response to external events and the collective desire to engage in work for social justice, we developed several outward-looking initiatives (see below). In our transition to becoming agents of change, we began discussing current events and commiserating on our desire to act during our work time. To provide space and time to organize efforts, we decided to dedicate one meeting a month to organizing. As the event date approached, we increased our meeting frequency and transitioned to discussing our roles and goals related our social justice campaigns. We recognized our expertise and limitations and realized that these emerging goals would require more sponsorship. We strategized to leverage institutional resources, and inter-personal connections where we had knowledge gaps to ensure the success of our initiatives (Fig. 1). For example, we consulted a social media influencer in animal behavior, Dr. Danielle N. Lee, for guidance in organizing and executing our campaign. We also leveraged the support of the WFAB POP Circle community and the Animal Behavior Society Twitter team to enhance the reach of our campaign. This change in orientation - from individual to societal ‘problem solving’ - solidified our group identity. While working on these initiatives as well as continuing our individual work time, we developed stronger bonds that many individuals in our group identified as a sisterhood (Fig. 3). Thus, the impacts of the POP Circle experience expanded beyond our individual and group development.

We produced several initiatives and tangible products not originally planned. First, we initiated a Twitter-based promotional campaign to highlight the excellent research efforts of 28 Black scientists working in animal behavior, using the hashtag #BlackInAnimalBehavior. This Twitter campaign resulted in thousands of impressions and retweets, with 220,276 impressions and 9,351 retweets. Second, we organized a graduate student professional development workshop for Black and Indigenous people of color, which was sponsored

Animal Behavior Society. In the virtual workshop we had a series of professional speakers, and we used our own experiences with peer coaching circles to help the graduate student participants form their own POP Circles. Our workshop was attended by 48 students with 90% of the students identifying as women, non-gender conforming or racial or ethnic minority. Graduate students began meeting in their new POP Circles in June 2021 (A single tweet celebrating this group garnered 10,600 Twitter impressions). Strong interest in this opportunity required us to decline 70 applicants and restrict participants to the Americas. The broad interest in this type of workshop illustrates the need for these resources worldwide.

## Reflections on Challenges and Benefits of the POP Circle Experience

After two years together, we have encountered several challenges in our POP Circle. One challenge to peer coaching groups that draw members from a small academic discipline is feelings of competition with peers who may be applying for the same grants, fellowships, or jobs. The recommendation is to first acknowledge these feelings, understand they are normal, then take time to self-reflect and manage them individually, and perhaps reduce them by genuinely celebrating others' successes. Another challenge is that compared to dyadic senior-junior mentoring, peer coaching does not necessarily provide access to the same type of "sponsorship" from a senior member of the field. It was thus important for us to continue to develop sponsorship and mentoring relationships with colleagues at other career stages. The POP Circle is a complement, rather than a replacement, for other sources of support and professional development. While not replacing senior sponsorship, POP Circles can still significantly increase social capital. Many academic societies accept nominations for positions or awards from any member, so peer recommendations can be equivalent to those from a senior mentor; also, for positions or awards that are voted on, a group of peers behind you may be more effective than a single senior scientist. Additionally, a group of peers can contribute a diversity of experiences and access to resources beyond what a single person, however senior, may provide. The last and most important challenge that we have experienced is how to support members through changes to group composition. For many reasons, group members may no longer be able or willing to participate in the circle, or if moving into a different career no longer find the circle useful to their post-academic lives. After forging such a strong group identity/sisterhood, unexpected departures are difficult to navigate and can bring feelings of guilt in remaining members about moving on without our friends. We recommend establishing guidelines for how to pause participation or leave the circle at the outset of group formation, to smooth later transitions.

Despite these challenges, we have identified far more benefits than challenges to our POP Circle structure. One benefit is that the egalitarian nature of the circle is built in: strictly equal allocation of work time reinforces the message that each member deserves equal attention, whether their issue is large or small, and alleviates individual anxiety about getting access to the work time needed in a group setting (Horner-Devine et al., n.d.). While we later relaxed the requirement that each person have work time in each meeting, we highly recommend keeping this format at the beginning because it provides structure and builds the social comfort needed to form bonds. Another benefit, in contrast to dyadic mentoring,

is that the group is flexible in terms of participation: the group does not fall apart if one or several members miss a session or two, and this resilience may be key to longevity of groups compared to dyads. Our group also utilized off-line communication (e.g., email, messaging apps) to facilitate involvement and communication, and offer on-going support between meetings or when meetings were missed. We also benefitted greatly from our group members being based at different institutions. We identified three benefits of our members coming from different institutions: 1) we could be more impartial in asking questions about situations and conflicts we had no direct knowledge of; 2) we could compare culture and norms across multiple institutions; and 3) as all of us were early career researchers, where institutional mobility is the norm (e.g. from postdoc to postdoc, or postdoc to faculty), a group that was not university-based was key to persistence and long-term support during high-stakes transitions. An emergent benefit was the ability to become agents of change. Through an increased sense of belonging and the power of collective action, we were able to develop and carry out initiatives we could not have done alone or in a single institution. Finally, the largest benefit of the POP Circle format is also the one that is by design: through regular meetings with trusted individuals, we were able to discuss topics that are typically outside of an academic/professional workplace, including promotions, failed promotions, inter-personal conflict, organizational skills, health challenges, unemployment, parenting, racial discrimination, unpaid labor, salary negotiations, and moving. We have weathered personal and global events, celebrated personal successes, became agents of change, and supported each other through it all.

## Recommendations for Institutional Action

Our experiences have demonstrated how professional society sponsorship, in the form of funding to create our initial POP circle, senior women scientists to serve as role models, society support to provide to social capital and institutional resources to back our efforts, amplification by social media influencers and our WFAB community, as well as interpersonal support we have given each other during our experiences in the circle, can have incredibly profound and positive benefits with strong ripple effects. Not only has this experience helped us to survive and thrive in academia, but it has also given us the energy, tools, and drive to share those benefits much more widely with our scientific community. One of the emergent outcomes of a peer coaching group is that the members can become more than just a group that helps and supports each other – members may morph to become powerful agents of change that support others outside the group. We believe that the cross-institutional structure and racially diverse composition of our group's membership led itself well to using our group as a jumping point for extra-circular impacts and allowed us to magnify positive changes outward.

Given the demonstrated positive benefits for individual members, as well as the potential for strong ripple effects that could benefit the scientific field, we encourage institutions to invest in the development of peer coaching experiences as part of the larger support and professional development for early career scientists. We direct the majority of our recommendations to institutions, because they have the social, economic, and political capital to institute programmatic changes at large scales. We suggest that institutions fund and provide support for professional society programs that enhance the career advancement

of marginalized people. This shift will require institutions to have policies, incentives, and the capital to generate communities of scholars that can foster belonging and career advancement (Estrada, Eroy-Reveles, et al., 2018; Gibbs Jr, 2018; Isler et al., 2021; Schell et al., 2020). For example, we recommend peer coaching circles be built into cluster hires, training grants, and outreach activities dedicated to advancing early career scientists. As these are long-term programs, grants that support professional development should have policies that allow grant activities to remain active for multiple years. It is also possible for an individual university or professional society to support individual engagement in a peer coaching circle by providing them with access to professional development funds. Evaluation of the impact of peer coaching should include its ability to reduce barriers that impede career advancement and produce outward-facing activities led by peer coaching circles (e.g., Twitter campaigns, as we described above) in addition to social and interpersonal metrics. This inclusion of social and interpersonal metrics in professional development programs is crucial because women and minoritized scientists cite interpersonal or social factors (as opposed to skills) as the primary reason for exiting the academy (Gibbs Jr, 2018; Isler et al., 2021; Mason et al., 2009; NPA Advance, 2011; K. J. Olson et al., 2020; M. Ong et al., 2018).

Identifying the infrastructure needed to support effective self-sustaining POP circles is critical. Our peer coaching circles were forged in physical meetings that are then perpetuated virtually; other circles have commenced completely virtually. As discussed in Horner-Devine et al., (n.d), there are several possible adaptations of the POP Circle model that have been successful, and there is a great opportunity to examine how adaptations, such as launching in person vs virtually, impacts POP Circle longevity and impact. At the minimum, infrastructure to support video conferencing and virtual workshops are needed. To enhance accessibility and effectiveness of peer coaching circles, budgets should include headphones, internet vouchers, live captioning software, institutional membership waivers, food per diems, software for video conferencing, and licenses for virtual workshop platforms (Hersh et al., 2020; Janelle & Hodge, 2013; Rubinger et al., 2020), and support from a trained coach or deeply experienced POP Circle participant to help launch a new circle. Equipping participants and organizers with these resources will help reduce the disparities in internet and technology access and ensure everyone is provided with the materials needed to fully engage in the program. Expanding the landscape of opportunity requires professional societies and universities to fund and catalyze these opportunities.

Women and minoritized individuals are already responsible for a disproportionate amount of service (Campbell & Rodríguez, 2019; Rodríguez et al., 2021), and organizing peer coaching circles requires tremendous effort. This phenomenon was reflected in our own peer coaching experiences, as senior women were responsible for organizing our peer coaching circles. Senior organizers of peer coaching circles should be compensated financially for their time and through course releases or funds for course buyouts. These efforts should also count towards promotion for society awards, grant funding, and tenure and promotion. To facilitate such organizing efforts being considered as contributions towards tenure and promotion, institutional representatives should provide letters of support that can be included in dossiers. Protecting the time of organizers and rewarding them for their efforts will ensure these programs continue to be initiated and have long-term success.

## Conclusions

Continued scientific advancement desperately needs institutional alliances to elevate marginalized scholars. These institutional alliances should center professional societies that offer an avenue for individuals from a range of intuitions to connect, and institute peer coaching programs such as the Power of Peers Circles that combat the interpersonal and social challenges that lead to the exit of marginalized people from the academy. Through senior women in our professional society, we were initiated into a Power of Peers Circle that elevated us from a loose aggregate of anxious individuals into a strong and productive sisterhood that enabled us to be agents of change. Our descriptions and recommendations here illustrate how similar experiences can be feasibly replicated by others interested in developing this critical form of support.

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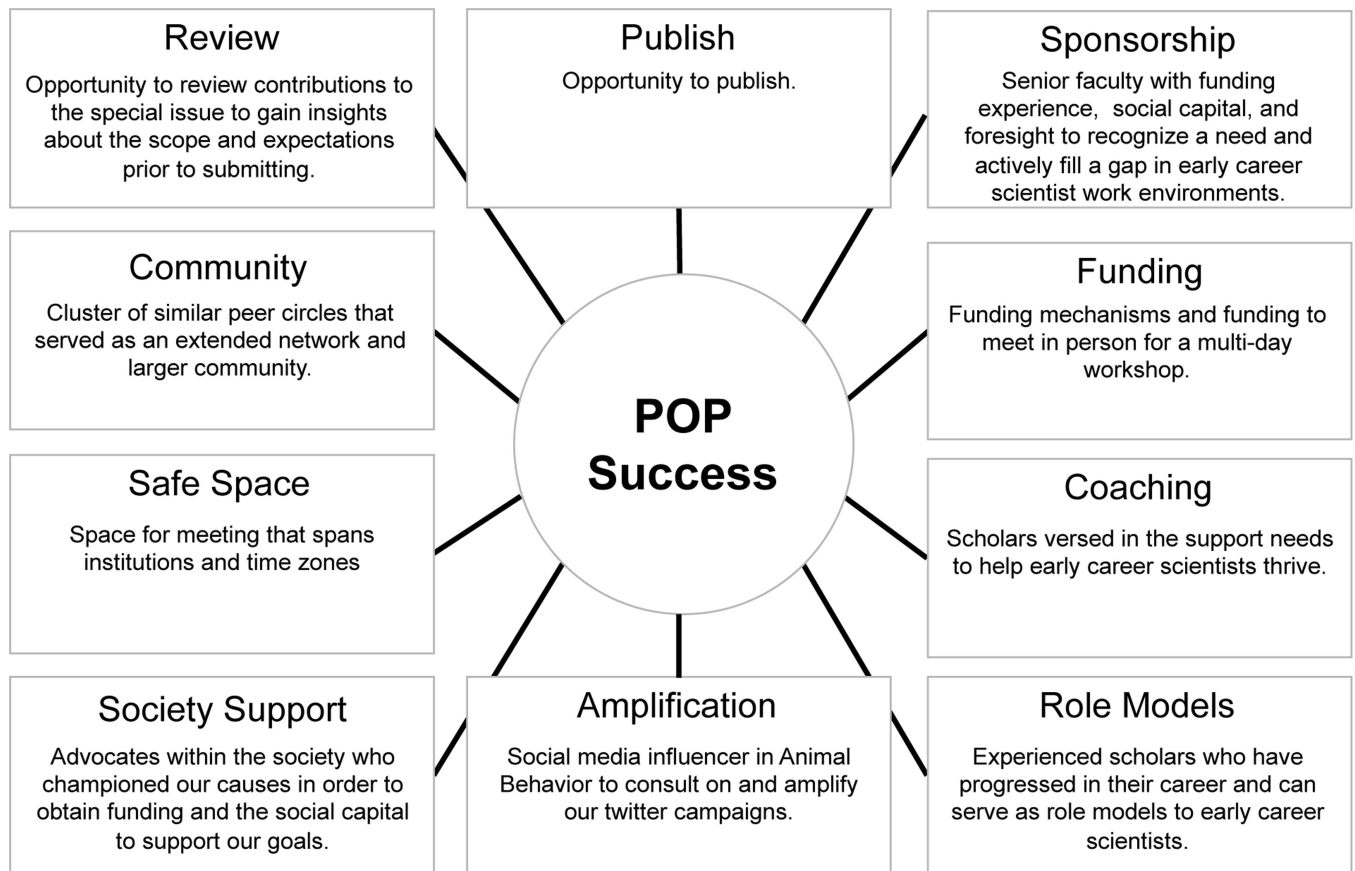
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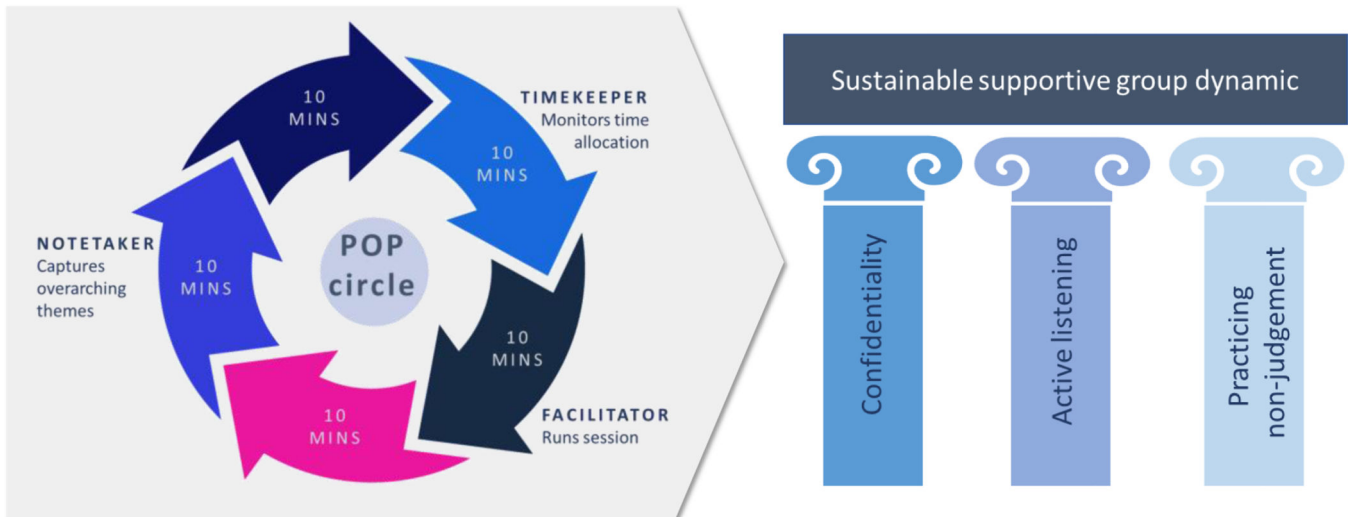


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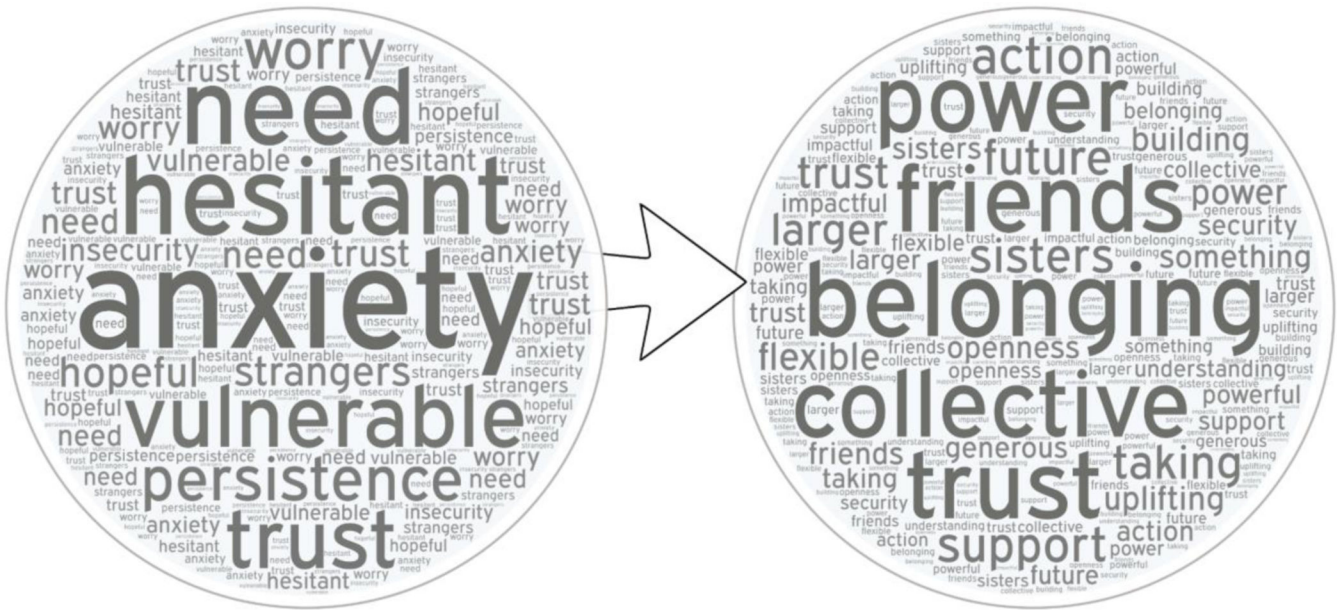
**Figure 1.**  
Growth Network

*Note.* Some of the institutional support that we received to help members of our POP circle thrive, and the individuals and institutions who were affiliated with these support mechanisms. There is overlap in membership of individuals who helped fill these needs. Thus, there were natural institutional alliances, which likely aided in maintaining momentum and providing continuous support throughout the life cycle of the group. This diagram is adapted from Claire Horner-Devine's Counterspace Consulting LLC.



**Figure 2.**  
POP Circle Structure

*Note:* Schematic of the mechanics of a POP Circle session, illustrating the three rotating roles and the 10-minute rotation between each POP Circle member's focal 'work time', alongside the three core tenets which have contributed to a sustainable and supportive group dynamic amongst participants.



**Figure 3.**  
POP Circle Initial and Current Themes

*Note.* Initial themes on starting POP Circles compared to current themes, illustrating how members of our POP Circle started as strangers but transitioned to supporters and friends with a high level of trust. This transition allowed us to take collective action and become agents of change in our own careers but also in much broader impacts on our professional society and our field of research. The first word cloud represents themes from our first 8 months of meeting. The second word cloud represents themes from after 21 months of meeting.

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