

Chapter 8

The Gift Relationship

How Mentoring Results in Success for Women in Field Station Leadership Roles

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INTRODUCTION

You can pick your ancestors, they don't all have to be the people related to you.

Leaders at field stations and marine labs (FSMLs) require a wide range of skills to successfully navigate the labyrinth of scientific, educational, operational, strategic, and political challenges needed for success in their job. These skills are rarely acquired via professional training, but rather gained over time through experience, reflection, and discussion. One critical type of relationship-building for leadership development is bi-directional mentor-mentee relationships. Mentees often have complex needs that evolve over the lifetime of their career. As such, some models of mentorship advocate going beyond a single mentor and instead emphasize the importance of mentor networks or webs, with mentorship evolving as the needs and aspirations of mentees change through career stages (Davies et al., 2021; Fogel, 2020; Montgomery, 2017). Additionally, some work environments are so niche that finding a representative mentor is “the professional equivalent of waiting for Prince Charming” (Sandberg, 2015, as cited by Scheinert, 2015, p. 7). Furthermore, women working in FSMLs may experience additional challenges due to remote locations, heavy workloads, and lack of representation, limiting access to and the availability of mentors.

FSMLs are small and circumscribed communities, often operating relatively independently and many times located in remote areas. As a result, access to representative mentorship opportunities can be limited. In addition, until recently, opportunities for women in leadership positions in field science

were rare, impeded by the disparate ratio of women to men in natural science faculty and leadership positions (Makarova et al., 2019). Due to the complexities inherent within FSMLs, little is known about the role of mentorship in field station leadership development. Therefore, we sought to provide a better understanding and explore the access to and role of mentorship in the lives of women FSML community members.

We interviewed sixteen women in leadership positions across a variety of FSMLs in the United States, Mexico, and Costa Rica to determine how mentorship impacted their careers and what suggestions they had to facilitate success for the next generation of field station leaders. The interviewees identified the following as critical aspects of mentorships: (1) for career advancement and acquiring new skills in STEM; (2) access to female and Black, Indigenous, and People of Color (BIPOC) mentors provide more relevant support to women and underrepresented scientists; and (3) a combination of formal and informal networks and programs is needed to alleviate the lack of diversity in mentorship pools and capitalize on the unique skill sets of peers within FSMLs (Davies et al., 2021; Dennehy & Dasjuptor, 2017; Huang et al., 2000; Montgomery, 2017). From these findings and participants' suggestions, we provide recommendations for addressing the gender gap through formal and informal engagement using networks such as the Organization of Biological Field Stations (OBFS).

LITERATURE REVIEW

Structure of Mentorship

Mentorship as a construct is constantly evolving. From the structure of the mentor-mentee relationship to the functions it serves to support personal and professional development, mentorship is dynamic and impacted by many different internal and external forces. In this section, we review the relevant literature, highlighting the structure of mentor-mentee relationships, the functions it serves within a variety of different contexts, and the challenges women in STEM may encounter while working to build meaningful relationships with mentors.

Mentorship relationships are defined by four structural categories: dyads, triads, collectives, and networks. Dyads are the simplest and most traditional concept of mentorship between two people (Wanberg et al., 2006). This mentorship structure is still common practice in some STEM learning environments, such as undergraduate and graduate research and in clinical internships and residencies. However, this standard is changing (Buzzanell et al., 2015; Long et al., 2018; Montgomery, 2017). Mentoring is becoming more recognized in the academic realm, and often several mentors are necessary to guide scientific

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careers at all stages (Long et al., 2018; Fogel, 2021). With triads, the mentee is co-mentored by two people, introducing an additional resource for personal or professional development as a single mentor might not have the skillset or expertise to help the mentee with a particular project, relationship, or other areas of interest (Yun et al., 2016). Collective or group mentorship is similar to a lab group with more than one mentee, peer mentorship, and at least one mentor (Greco 2014). Finally, network mentorship is a mix-and-match of mentors, including peer mentors that do not necessarily interact directly with each other, but all work with the same mentee on various aspects of the mentee's career and life (DeCastro et al., 2013; Halvorson et al., 2015; Long et al., 2018).

Definition of Mentorship

There are many definitions of mentor and mentorship, adding layers of complexity to the mentor-mentee relationship and the important role it plays in leadership development. A quick Google search of "definition of mentorship" resulted in 8,960,000 results. Results reveal a complicated study area where academics, practitioners, and mentors/mentees not only challenge how mentorship is defined but how it is implemented in a variety of disciplines. While the researchers acknowledge these complexities, the goal of this research is to contribute a deeper understanding of how mentorship (dis)functions within the context of FSMLs, especially for women. As such, the researchers open this discussion with a broad definition of mentorship. Dumas (2020) defined mentorship in a traditional manner as "a reciprocal relationship between an advanced career professional and a protégé aimed at promoting the career development and fulfillment of both" (p. 167). This definition underscores the importance of the mentor(s), the mentee, and the relationship between the two or more. Although mentors and mentees may negotiate goals for the relationship, the focus is often on career development, which may include promotion, tenure, and leadership. Emerging in the mentorship literature is a growing debate related to role definitions: mentor vs. role model. Méndez-Morse (2004) expanded on the mentor versus role model definitions, noting the following:

A role model was defined as someone whose characteristics or traits another person would want to emulate; a mentor was defined as someone who actively helps, supports, or teaches someone else how to do a job so that she will succeed. (p. 565)

Whether defined as a role model or mentor or whether a mentor serves as a role model, these strategic relationships play a critical role in professional development.

Research on the Role of Mentorship

Mentorship may serve a variety of different functions or roles for both the mentor and the mentee. In a professional context, mentors often provide career advice, access to networks, and strategic insights into how to achieve career goals with a specific organizational context. The mentor also may care for the other aspects of a mentee beyond their career, such as providing psychological and emotional support to help resolve personal challenges that may negatively impact the life and/or career of a mentee. In a more comprehensive sense, the mentor can serve as a “silent” partner (Fogel 2019), offering “behind-the-scenes” sort of advice, supporting a mentee who shares a similar identity and values.

A large body of literature demonstrates mentorship plays an important role in building people’s career identities, self-efficacy, and retention within their field (Davies et. al, 2021; Eby & Allen, 2008; Méndez-Morse, 2004). Eby et al. (2008) performed a large meta-analysis of 106 studies to determine quantitatively if mentorship resulted in positive outcomes. They found a wide range of favorable behavioral, attitudinal, health-related, relational, motivational, and career outcomes for quality mentor-mentee relationships. Although the effect size was generally small, the most significant outcomes were observed in academic settings. Similar to Eby and Allen (2008), Estrada et al. (2018) found that quality mentorship and research experience occurring in the junior and senior years positively impacted students’ science efficiency, identity, and values and led to an upward career trajectory for up to four years after graduation.

STEM Lagging Behind

Although mentorship has been shown to positively impact the recruitment and retention of diverse individuals, some disciplines and professional fields are still working to build positive mentoring programs and organizational cultures. A body of STEM-related research has long identified the “leaky pipeline” in which the number of doctoral receiving students is much greater than the number in academic positions which acts as a gender filter of sorts, sustaining the lack of representation for women across scientific disciplines (Blickenstaff, 2005). For example, Bernard and Cooperdock (2018) found that there was no progress in diverse doctoral graduates in geosciences from 1973 to 2016. In higher education, diversity decreases from undergraduate to graduate to faculty levels (Bernard & Cooperdock, 2018). Diversity in this context includes race, ethnicity, and gender (Ford et al., 2019). This “leaky pipeline” is not unique to geosciences and negatively impacts a majority of academic disciplines in the sciences. More starkly, however, this gap

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in diversity, leadership, and opportunity can be seen in the STEM fields. Collectively, the literature suggests:

The current state of affairs suggests that once women enter STEM, they are faced with highly challenging and difficult circumstances that create uneven and extremely difficult conditions that may prevent them from succeeding and having healthy and positive work experiences. (Saxena et al., 2019, p. 509)

One solution may be an increased emphasis on and opportunity for mentorship. Research suggests women working in STEM who do not have an opportunity to connect with mentors receive fewer promotions and experience stalled organizational growth; conversely, the retention rate of women in STEM is higher in mentors who invest in long-term career goals of mentees (Saxena et al., 2019; Higgins & Constellations, 2001).

Mentoring Challenges at Field Stations

Research exploring the barriers for women in STEM and the opportunities afforded by mentorship often focuses on academic settings (Boag & Chardon, 2021; Dennehy & Dasgupta, 2017; Dumas, 2020; Hermann et al., 2016). Academic settings are the closest parallel for FSMLs, as some FSMLs are sponsored by and funded through institutions of higher learning; however, FSMLs as workplaces are unique and underresearched in the academic/scholarly literature, underscoring the importance of this research and further defining the role mentorship plays for women working in these environments. For instance, most field stations are isolated with proscribed and small communities, from one to a few employees (see chapter 1 by McDermott, Gee, & May in this edited volume for more information). Consequently, FSML cultures are driven by the demographics of the resident staff, and the representation of scientists from different backgrounds is often limited relative to other academic settings and STEM fields.

Field station environments present both advantages and challenges for mentorship. The relaxed environment and variety of incoming scientists and educators present opportunities for informal exchanges that are less available in academic or lab settings (see chapters 1 McDermott, Gee, & May, 4 Debinski, and 10 Struminger, Adame, & Shannan in this edited volume). Conversely, the separation of many field stations from the host institute or university can limit the availability of more formal networking and mentorship opportunities, such as professional society workshops or gatherings. Additionally, the workload, especially during peak field seasons or during accelerated field classes, can be exceptionally high, up to twelve hours or

more per day which reduces the time available to network or build mentor relationships.

Current Issue

The professional practice of mentoring has progressed rapidly, and research has established the benefits of mentorships for success and job satisfaction from medicine to business to academia (Eby & Allen 2008; Eby et al. 2013). Although research has found that mentoring increases retention rates, little is known about the role of mentoring on leadership and career opportunity trajectory. Even less is known about the role of mentoring for women, especially women working in field-based STEM environments. Although advocacy groups, such as *The Association for Women in Science*, work to promote the full participation of women across all scientific fields through mentoring, education, and job opportunities (Fridkis-Hareli, 2011), FSMLs have additional layers of complexity that are not encountered in traditional academic settings or within laboratories. The need for more research is evident as women continue to be underrepresented, especially BIPOC in FSMLs (Davies et al., 2021). Gaensler (2018) found that setting objective goals to measure and implement diversity, equity, accessibility, and inclusion to attract and retain top talent is a critical trait to attract women and underrepresented individuals to field stations and marine laboratories, underscoring the urgency.

To address the gap in the literature and identify opportunities for mentorship for women working in FSMLs, the researchers were guided by the following research questions:

RQ1: How does mentorship facilitate career development (specifically for those in a FSML position)?

RQ2: What factors do women at field stations use or have used in the past to select mentors?

RQ3: How can we create mentorship roles/programs formally and informally (i.e., best practices) to support diversity and inclusion at field stations?

METHODS

Population and Sampling

To answer the research questions, qualitative research methods were used. A meta-literature review and sixteen interviews were conducted to answer the research questions and explore the influence of mentorship in women's careers at FSMLs. To be included in the sample, interviewees had to

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self-identify as women, be at least 18 years old, and have two or more years of experience working at FSMLs in roles that required some amount of supervisory duties (e.g., overseeing researchers, educators, interns, etc.).

We used our own personal networks to recruit participants. Specifically, we chose women in various stages of their careers at field stations ranging from those just starting out (minimum of two years) to women with decades of experience. We also specifically selected women of various ages at institutions that varied in size and were distributed throughout the United States, Mexico, and Costa Rica. A variety of FSMLs were selected, from large private foundations to FSMLs associated with research universities to smaller organizations associated with four-year colleges or stand-alone nonprofits. Using these selection criteria, we collected a diverse range of experiences.

Instrument

Data were collected using semi-structured interviews with a set of open-ended questions facilitated and recorded via Zoom calls. Semi-structured interviews allowed the subjects to more fully express themselves in a discussion format with the interviewer rather than a straightforward question and answer format. The informed consent document was shared with the subjects several weeks before the interview via email. All subjects agreed to be interviewed. After obtaining informed consent, we opened the interview with a rapport-building question to ease the participants into the interview process and establish open communication (Guillemin & Heggen, 2009). Each participant was asked to tell us a little bit about themselves as if they were explaining their position in a few sentences to a young scholar. All interviewees had previously met the interviewer (Sarah Oktay). Each interview subject was asked to provide their definition of mentorship to provide a shared context between the interviewer and the interviewee. The interview protocol included a total of 22 questions (Appendix A) designed to help each interviewee describe their experiences as mentors and as mentees. About 60% of the interviews extended 10 to 25 minutes beyond the allotted interview time of 45 minutes. Consequently, some interview questions were unaddressed, including how often to meet, for how long, and what type of settings worked best (Questions 12 and 13). No demographic data were collected to help avoid any discomfort associated with sharing personal aspects of identity to help promote disclosure (Bradimarte et al., 2010).

Qualitative Analysis

After all of the interviews had been conducted, the audio recording was transcribed using Zoom's transcription feature. The interviews resulted in

approximately 1,600 minutes of audio and 231,850 words (approximately 925 pages double-spaced) of transcribed data. The sixteen interviews provided theoretical saturation to engage in qualitative analysis. Thematic coding was used to identify common themes shared by participants. The researchers coded for value themes and themes in verbal discourse (Lindlof & Taylor, 2017; Saldana, 2013). First, we coded the data into as many categories as possible using open coding. After the data had been coded into different categories, we compared key ideas within the data to organize the findings into larger, overarching categories. Using grounded theory and thematic framework provided by Corbin and Strauss (1990), these categories were reconfigured using axial coding to create new encompassing themes and answer the research questions. The researchers kept and discarded themes throughout the process, using thematic analysis and the research question to guide discovery. Quotes were pulled from the interview transcripts to exemplify the themes identified.

RESULTS AND DISCUSSION

Three research questions were addressed during the course of this study. The results showed that it was important to contextualize the characteristics and activities that delineated mentorship for each interviewee. The research questions elicited introspection, direct observations, specific advice, and recommendations for improving and expanding mentorship opportunities for women at FSMLs. A variety of themes were repeated by participants eventually reaching almost consensus-level agreement. Respondents identified the following themes as critical to facilitating career development: timing, altruism, and imposter syndrome. In addition, respondents identified the following selection criteria and traits to be considered when seeking out mentorship: integrity, trust, and respect; role models; and good vs. bad mentorship experiences. Lastly, respondents identified the following themes as critical to creating more opportunities for women working in FSMLs to access and benefit from mentorship: networking, tools, formal vs. informal, explicating barriers, and representation.

Definitions: What Is a Mentor?

The literature provides a spectrum of definitions for mentors from active to passive and peer-related to supervisor/supervisee (Dumas, 2020; Méndez-Morse, 2004); however, for the participants in the sample, the exercise of defining what a mentor is proved to be thought-provoking and elicited a wide range of responses from descriptions of formal mentor-mentee relations

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to stories of peer-to-peer or very informal mentoring/advice sessions. For example, several respondents mentioned receiving assistance "out of the blue" from unexpected mentors, for example, a "mentor can be hiding in the wings." Similarly, several people mentioned mentors that noticed when they were having difficulties, such as in writing proposals, finishing a thesis, or delegating duties. All respondents felt that a mentor should not be a mirror of who you are, but complement the abilities and teach skills that the mentee does not have or could not gain easily on her/their own. Interestingly, the simple act of asking these questions caused much reflection with many participants stating that they would be contacting their mentors to thank them and that they would be more mindful of their current mentoring relationships. The act of defining mentorship also was quite reflective as they realized many people served in a crucial mentorship-type service throughout their careers without being official mentors.

The definitions of mentorship the respondents shared included, "Providing other people with opportunities for growth in whatever way they want to grow." A "guide on the side rather than [a] sage on the stage." Several respondents felt mentors worked best as sounding boards. For example, one respondent said, "I think mentors are there to show the mentees options, to discuss the pros and cons of those options, and to provide pathways and discuss the implications of certain pathways." Mentors can be "someone who has looked out for you, supported you, maybe found money for you and presented opportunities to you; someone who clicks with you."

Many respondents were looking for deeply experienced individuals for mentors, for example, someone who "has been around the block . . . and can leave those breadcrumbs of hints on how to navigate specific situations." Although respondents said they had multiple lifetime mentors in supervisor or advisor roles, they preferred mentors who were "outside of a hierarchical relationship [not supervisors]," and they also looked for "people who do things you don't do well." In the end, the participants added to the over 8 million "hits" for mentorship, underscoring its complexity and value as both unique to the individual participants and relationship-based.

RQ1: How does mentorship facilitate career development (specifically for those in a FSML position)?

Mentorship is one of the most important factors in determining success and in learning about and taking advantage of new opportunities and advancing into leadership positions for the participants in the study. Specifically, respondents identified the following themes as critical to facilitating career development: timing, altruism, and imposter syndrome.

Timing

Each respondent felt very strongly that early mentoring and mentoring that occurred at critical times during their career made a significant impact, contributing to their success and ability to obtain a certain position or advance in current ones. This is evidenced by one respondent who noted, "I wouldn't be where I am today without the support of mentors." Time and time again, respondents stated that their career success was directly linked to well-timed and in some cases fortuitous mentorship and guidance. From encouraging participants to continue their education, for example, "Without that strong mentorship from him, I don't think I would have gone to do a Ph.D.," to how they practiced leadership, mentorship played a critical role. Specific statements included, "[mentorship] completely transformed me from a manager to a director" and "[the] best mentors are the people who made such an impact on your life that you know you wouldn't be where you are today without that person."

Altruism

These reflections on past mentorship relationships evoked strong feelings of gratitude and "luck" that permeated their need to participate in providing quality mentorship to students and colleagues. That desire to repay the kindness from their mentors was very prevalent and discussed by the majority of respondents, "You know, it helps you feel a sense of purpose in your job . . . helping see these folks succeed . . . wherever their path takes them . . . it's just really gratifying." Almost all respondents stated that it was important to "pay it forward" to create a legacy by sharing their hard-earned knowledge with others.

In some cases, negative experiences or major barriers to access mentors also drove this altruistic tendency, "That's a role (mentoring) that I want to fill for other young women coming up in the sciences because I feel like it was lacking for me" and "I have had so many bad/shitty mentors that I want to make up for them." In some cases, it was easier for respondents to give than receive advice "I give other people better advice than I give to myself."

In addition, the gift of an altruistic mentor was mentioned by many of the respondents as a trait they desired. Straus et al. (2013) identified the most valued personal characteristics of successful mentors. The most frequently mentioned trait desired by mentees in their medical-based academic setting was an altruistic mentor. Mentees need someone who gives freely of their time, attention, and advice.

Altruism was also demonstrated by mentors who expressed the desire to support emerging scientists and women; however, they also expressed benefiting from these relationships. For these mentors, mentorship is seen

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as a reciprocal relationship vs. a one-way flow of support. Specifically, one respondent highly valued the connection with younger people,

I think the biggest and the best thing I got from being a mentor is the connection with younger people. . . . people that I've been mentoring are getting positions and doing things and being successful in their own lives [and] that helps me make new connections with new people. I have access now to new information and all of the things that they're learning.

Another respondent felt that the act of mentoring allowed one to evaluate their own progress and job satisfaction, "One of the things I like about being a mentor is it helps me define what I like about my job and what it takes to do my job." Another respondent emphasized that mentoring should illuminate the positive aspects of their career, "I don't want to turn off mentees by only talking about the hard stuff; pass along why you love your job." Another respondent said regarding "the benefits of being a mentor to younger women coming up in the field" is that, "I think that it has made me more empathetic." Some of these benefits are directly related to the need to develop connections, create a network, and think about one's own career over time. For example, members of the OBFS who attend annual meetings list the primary benefits of those meetings to be the networking and peer-to-peer mentoring opportunities which enable them to crowdsource solutions for the problems encountered in field station leadership roles.

Imposter Syndrome

Impostor phenomenon (IP) or syndrome is the "psychological experience of believing one's accomplishments came about not through genuine ability, but as a result of having been lucky, having worked harder than others, or having manipulated other's impressions" (Langford & Clancy, 1993, p. 495). While many people experience IP at various stages of their personal and professional lives, a body of literature explicates high levels of IP in women, especially for women in academic contexts (Langford & Clancy, 1993). For women experiencing IP, there is a tendency to downgrade or dismiss accomplishments as they constantly assess their performance based on an "internal set of standards which are never perceived to be met" (Chandra et al., 2019, p. 27). Within the context of mentorship, IP may pose a barrier for mentees, as there is a significant fear of being perceived as incompetent (Boag & Chardon, 2021; Chandra et al., 2019).

During the interviews, several respondents used the word "luck" to describe how they happened upon a positive mentorship opportunity or jumped into a new career they had not previously considered. In some cases, this was a

result of a mentor waiting in the wings looking out for them and keeping an eye on likely opportunities they felt would match the person's skill set (which is a sign of both a good mentor and a good leader). Upon reflection, many of the interviewees realized that what they perceived as "luck" was actually earned respect and altruism on the part of formal or informal mentors. One person stated, "I like to mentor students who are insecure about their roles. I can identify as I experienced imposter syndrome."

Participants underscored the importance of mentorship as a mechanism to manage IP. By providing "psychosocial support" and sharing their own experiences with IP, mentors can enhance a mentee's perceived competence, identity, and effectiveness, thereby alleviating feelings of IP (Estrada et al., 2018). Specifically, "good" mentorship appears to be helpful in reducing the feeling of impostorism by focusing on a mentee's potential and providing concrete skill-based assistance and advice. Impostorism was closely related to their likelihood of asking for mentorship; however, mentees may work around IP by focusing on needed skills vs. the need for IP-specific support. For example, respondents frequently noted they used mentorship as a touchstone and to help them acquire skills they needed. More than half the respondents used mentoring sessions with a variety of people to help them learn key aspects of their jobs, such as hiring, budgeting, writing proposals, and working with employees.

RQ2: What factors do women at field stations use or have used in the past to select mentors?

In response to RQ2, respondents identified the following selection criteria and traits when seeking out mentorship: integrity, trust, and respect; role models; and good vs. bad mentorship experiences.

Integrity, Trust, and Respect

According to interview respondents, integrity, trust, and respect are critical requirements for a successful mentee/mentor relationship. Every respondent mentioned at least one of these characteristics, and typically all three of those specific words were used to describe effective mentoring relationships. Participants used the following descriptors to characterize these traits: "trustworthy, honest, [having] good listening skills, available (physically and emotionally), empathetic, objective, non-judgmental." One participant underscored the vulnerability of mentees in seeking support, noting trusted mentors do "not [make] fun of a mentee when a mentee does not know something." Another described the ideal mentorship as something that "requires trust and respect between mentor and mentee; [you] count on that mentor for advice

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and being able to trust the mentor that they will have your back and be there for you.” Some respondents said that without deep trust between them and their mentor, they would feel uneasy about asking questions and exposing their incompetence (Boag & Chardon, 2021).

Similarly, research underscores the importance of integrity, trust, and respect in the mentor-mentee relationship. For example, Straus et al. (2013) identified these traits in their very similar study of faculty in medical schools. Additionally, feelings of trust, empathy, respect, and connectedness are often used by mentors when qualifying relationship quality (Ragins, 2010). In the literature, respect is highlighted as critically important for intercultural, intergenerational, and intergender mentor-mentee relationships. Specifically, perceived mutual respect for differences must be situated within the context of the relationship for both parties to feel valued and validated (Merriweather & Morgan, 2013). Finally, within the context of STEM, FSMLs, and academic/researched-based contexts, mentors and mentees are expected to behave in ways that meet the standards for ethical practice as defined by their disciplines with mentors often serving as exemplars (Gray & Jordan, 2012).

Role Models

Participants did not clearly distinguish between “role models” and “mentors” when seeking out sources of support, a distinction previously cited in the literature (Méndez-Morse, 2004). In certain cases, mentor and role model were used interchangeably, while at other times, distinctions were noted. For example, respondents broadly described people who had succeeded or achieved a leadership position as excellent mentors or role models. The word role model was used specifically; however, when reflecting on their responsibility to guide and support younger women, especially as it relates to parenthood and family, one interview subject stated they “also had mentors who did not know they were mentors [who were] mentoring by example,” leaning more toward the definition of role model (Méndez-Morse, 2004).

“Good” vs. Bad Mentorship

Respondents often reflected on “good” mentorship and how it impacted their career trajectory. Several respondents said that good mentors “found the best in them and brought it out.” These mentors boosted their confidence and gave them a safe and trusting avenue to ask questions that may have been difficult or embarrassing to ask (figure 8.1). Other respondents were not aware that mentors were “looking out” for them, in many cases making jobs available and bringing up opportunities that greatly expanded their horizons and opportunities. From the respondents interviewed, it appeared that “good,” in this case “effective,” mentorship provided the support to attain leadership

positions and leadership opportunities. Good mentorship may change over time, however; three respondents mentioned that initially they mentored as they had been mentored but as they evolved in their careers, their definition of a mentor also evolved, for example, "I think early on your definition of mentorship is the way you were mentored; as you progress in life you start to pull in other people" and redefine what "good" mentorship looks and feels like.

What Does "Good" Mentoring Look Like? What Is the Result or Impact on People? We asked the respondents what they thought of when they thought of "good" mentoring. They mentioned the following traits and characteristics: "great listener"; successful and admirable; "inclusive of a wide range of people, values, and traits"; reflective and self-aware; "knowing where they succeeded and where they failed"; "observational and offering support to others"; "generous with their time, energy, and knowledge"; and "caring, honest, and approachable." Whether they preferred extensive one-on-one mentoring or a more hands-off approach varied throughout the careers and between respondents.

Additionally, "good" mentorship came from a variety of sources and often played a role in building self-confidence and self-efficacy. From the interviews that we conducted, we found that mentorship from parents and college and graduate school experiences shaped how women developed their confidence and navigated through a diverse array of career opportunities. Confidence in their abilities seemed to determine a potential leader's success during graduate school careers when interacting with mentors, such as faculty, thesis/dissertation committee members, and colleagues. Women tended to seek a variety of mentors who possessed the expertise they needed to advance in their career trajectory. In spite of the difficulties that could have held them back in their early careers, the majority of women interviewed felt that they were supported in their career path by mentors.

Personality and style were also explored by interview participants in relation to "good" mentoring. Respondent answers diverged regarding the type of personality that made the best mentor and how closely that should mesh with the mentee's personality. Some people expressed they worked better with people who thought more like them and others preferred mentors that were relatively different in approach and personality (Davies et al., 2021). Respondents wanted their mentors or mentees to "jive with them." One respondent stated, "Having a mentor that you don't necessarily agree with on everything allows you to balance out your perspectives. I enjoy having relationships with people who don't think the same way that I do."

Although having differing opinions was considered an asset for some, being able to get along and communicate well was critical for all respondents. Descriptions of ideal mentors landed squarely on words like warmth, caring, nurturing, and trusting. Honesty and openness were also highly valued and

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cited by most respondents. Respondents unequivocally stated that a personality match was instrumental in having a productive relationship; for example, "I would say personality is a big factor; getting along on a personal level. You need to feel comfortable with each other. There needs to be [like] a bond."

Specific comments and quotes from the respondents regarding "good" mentorship/mentors are diverse and included the following:

- "The best mentors . . . feel like part of 'her entourage.'" Many respondents mentioned that they kept in touch for many years with long-term mentors who became fixtures and/or touchstones in their lives.
- "True mentorship is a selfless act. Listening is so important and it is better if one can be truly objective with the mentee."
- "It'd be someone who can see your capabilities and our tangible potential; what you're capable of. Even if you're not willing to admit it."
- "A true rare mentor is that person that you know will always give you the straight answer, but also when you come away from that conversation, you're like, 'Okay, I can do this.'"
- "But I think that people saw something in me that I didn't necessarily recognize and he brought it to my attention and they made me feel like I could actually do that job."
- "[An] ideal mentor is somebody that you respect, somebody that you hope to emulate."
- "[Good mentoring is] being selfless and really like thinking strategically or ahead about [what] the next steps for this person might be and also just thinking carefully about what you say; make sure in longer relations to check-in over time [and] ask them if there's things that they could use that we're not doing or covering."
- "I'm looking for women who I think are well-rounded, who are welcoming or easy to talk to, who I think care about equity."
- "Somebody is taking a broader look at your skillset and helping you build your skills."
- "Helpful to keep you humble and point out things you still need to learn in a less stressful manner"
- "I look for mentors who are successful and not exactly like me. Works if they are older with more experience and I prefer talking to women not in academia."

As mentioned above, "good" mentoring not only helps people see themselves as capable of doing new jobs, but it also increases confidence, builds relationships, and develops personal skills that transcend the relationship (figure 8.1).

What Does "Bad" Mentoring Look Like? What Is the Result or Impact on People? "Bad" or poor or ineffective mentoring can set back a person's

career and even cause them to leave the field. Several respondents told stories where they observed other women leaving the field or changing jobs based on a lack of support or even active discouragement from mentors.

Respondents typically stated that poor mentors either did not have the time or did not have the desire to help them succeed. In a few instances, poor mentors felt competitive with their mentees. Three respondents mentioned that some mentors were interested in a romantic relationship only, and when that was not part of the equation, those mentors quickly lost interest. One interviewee said that her poor mentors were field station users who simply wanted to have access to the field station or preferential treatment.

One respondent mentioned that she had "so-so mentors who were not looking out for her best interest and not very invested." Another stated that one of her bad mentors had adopted a "mean dad" model of mentorship. She speculated that the person demonstrating bad mentor characteristics was likely unaware that he was not helpful. One respondent noted that a

big part of mentorship is sometimes you're just learning it together. And sometimes if you know too much about something you're not really a very effective mentor, because you skip all the parts of it that you got hung up on before.

Another respondent emphasized that the time invested was a critical factor,

If someone hasn't taken the time to get to know you [and] to figure out how to bring the best out of you, then it's not going to really help you grow in a way that gives you that confidence that you need at every stage of our lives.

A few respondents mentioned that in the case of bad mentors, especially those in a supervisory or hierarchical role like a graduate advisor, that students did not have any training on which traits to look out for in a mentor and how to extract themselves from these situations, that is, "an eject button." Some respondents described instances of substandard mentorship that arose from supervisors who were de facto mentors and responsible for providing professional development advice when they were rarely properly prepared: "Often mentors tend to be our bosses, and we don't get a chance to choose them."

RQ3: How can we create mentorship roles/programs formally and informally (i.e., best practices) to support diversity and inclusion at field stations?

In response to RQ3, respondents identified the following as critical to creating more opportunities for women working in FSMLs to access and benefit from mentorship: networking, tools, formal vs. informal, explicating barriers, and representation.

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Networking

Increasing formal and informal networks can be extremely effective at creating mentorship opportunities. Networking benefits both the mentor and the mentee: "Connections and knowledge from people I mentor benefit me over time," and "you never know when that person will be in a position to help you." Several respondents mentioned that their mentors became part of their long-term network and that they follow the students, employees, and interns they mentored for years. The desire to provide mentorship in order to carefully and methodically develop a network of future colleagues was an unexpected benefit listed by about a third of the respondents.

Tools

Three tools identified by participants as critical to the mentor-mentee relationship include meetings, contracts, and reflection. First, the majority of participants underscored the importance of meeting regularly and adapting to different communication channels when needed. Almost universally, respondents preferred one-on-one, in-person, relatively frequent (weekly to monthly) meetings with their mentor or mentees. While different mentors and mentees have different needs, expectations, and desires regarding how frequently they should meet, regular meetings or check-ins allow for relationship development and help build trust (Eby et al., 2007), a desired trait defined by the participants in the study. All of the participants had adapted to distance meetings as a result of the pandemic, and some preferred to use Zoom or other interfaces because of the convenience factor. Interestingly, three of the younger mentors even provided mentorship to their students and assistants via text. The experiences of the participants, while not fully developed, points to the growing significance of e-mentoring not only to meet the needs of learners coming of age in the digital era but also to promote more inclusive practices and global perspectives (Neely et al., 2017; Packard, 2003).

Contracts or some set of defined expectations were also considered as important by some interview participants. For example, one respondent provides a list of six to eight expectations to her mentees, which include items, such as "I will always listen and hear you" and "I will be honest" that was passed down to her from her advisor. Providing clear expectations may serve to promote relationship development and disclosure. Another respondent had a packet of material they provided to new mentees. Although the details of the packet were not defined, general information regarding resources, "how-tos," or other workplace-specific information may be useful. Having some type of implicit or explicit "contract" outlining expectations was mentioned by about a quarter of the respondents and supported as a useful tool

for some mentor-mentee relationships. Steele (2013) argues these contracts set "the expectations for each party, provide a context for specific interaction," and reify the definition of mentorship "for each protégé-mentor pair as they shape and are shaped by their experiences in the relationship" (p. 128).

Finally, several respondents felt that the act of talking about mentorship and reflecting on how their careers have benefited from mentorship helped them develop best practices to more mindfully conduct their own mentor-mentee relationships. One person suggested holding frequent workshops to share experiences in an informal but regularly held venue, perhaps through OBFS, as a way to develop mindfulness about mentorship capacity and capabilities. Many respondents felt that training could be helpful for mentors although others felt that some good mentors were just "born that way" and naturally good at advising others.

Informal vs Formal Mentorship

The literature distinguishes between informal and formal mentorship as did the participants in our study. Informal mentorship is considered a "natural component" of many relationships that emerges in a variety of different contexts (Izner & Crawford, 2005, p. 35). Formal mentorship, on the other hand, tends to be more structured, outcome-driven, and may or may not be a "natural" coming together of the mentor or mentee based on similar interests, values, or other aspects of self (Buzzanell et al., 2015; Izner & Crawford, 2005). Interview participants provided less "literature-based" definitions and focused more on the structure of the meetings, use of contracts, and other more subtle distinctions between informal and formal. Some participants, for example, advocated for regularly scheduled meetings with employees or students to check in both with and without an agenda. Ninety percent of the respondents felt that the frequency and meeting length for mentorship sessions often depended on the goals, length of time in the relationship, hierarchical relationship (e.g., for younger students or new employees, more frequent sessions). There was also a heavy emphasis on time and commitment. Both the mentor and mentee need to value each other's time and success and be capable of committing to an active relationship with give and take. A majority of respondents said that both mentors and mentees should "share expectations early and often," referencing the importance of some formal agreement between the pair. Many interview subjects mentioned it was critical for the mentee to be aware of their goals and to communicate that to the mentor whether in a formal document that is signed by both parties or loosely discussed periodically over the course of the mentor-mentee relationship. Mentees also expressed the need to have a plan for the goals they wished to

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accomplish, as one respondent succinctly described it: "What's your mission statement? What's your vision for yourself?"

Others described informal outreach to a variety of mentors based on the question one has or the skill one needs to attain at that moment in time, describing a more informal relationship. As noted by one interviewee: "I usually would send an email or call and say, here's my situation. What do you think is the best way to approach this?" The location also contributed to the informal nature of the relationship. At least seven respondents mentioned that mentoring while hiking or doing fieldwork or watching the ocean or otherwise occupied was more productive and less stressful for both parties. They enjoyed mentoring on the side while doing tasks to allow for natural dialogue and deeper conversations. The locations of field stations in remote and beautiful settings became an advantage for these conversation spaces. At least two respondents mentioned that they took their mentees somewhere significant to foster a sense of relaxation and "specialness."

Barriers

Field stations breed resilience and a "can do" attitude, but they can also be far removed from population centers, host institutes, or college campuses (Billick et al., 2013; Struminger et al., 2018). This distance led many of the respondents to list "lack of access" to mentors as a barrier: "Really one of the main ones [barriers] was just [being] a little bit isolated at a field station and I think that's a classic one for field stations. It's really easy to feel isolated." Thus, working at remote field stations proved to be a barrier for many of the interviewees who had to be more creative and reach out proactively for mentorship. Others had trouble finding good mentors in their field or for their unique job positions (e.g., GIS, computers, sensor networks, etc.). Specifically, leadership positions at FSMLs are a "very unique job [that] creates a barrier [where it is] harder to find mentors although OBFS colleagues have been helpful; maybe set up on the website a way to share time and advice sessions." Availability and time for mentorship were also listed as barriers.

Representation

As it relates to representation, approximately 85% of the respondents noted that having female mentors is important. Interview participants noted "it's absolutely critical to have BIPOC mentors and students"; "I wish that I would have had more female mentors. Diversity of voices is tremendously important. For me, that was lacking." Other representative responses include the following:

- "[It is] critical there are mentors out there that represent the full diversity of people that we have in our world; [It is] huge for her having a very strong

female scientist as a mentor early in her career made her feel she could do science [and could be a leader]; resilience is really important.”

- One respondent shared that she had noticed many BIPOC role models who were called to fill multiple roles, and consequently would be stretched thin as one of a small handful of people who could mentor upcoming BIPOC students or scientists. To make matters worse, “in some programs BIPOC students are poached by the government [who can offer higher starting salaries] after they get their master’s degree.”
- “It’s incredibly important because there’s a lot of nuances that come with being a woman or a Person of Color and not having mentors that are similar to you [is a barrier]. It will never be adequate, there’s a lot that goes along with those identities.”
- “Students need a diverse set of mentors to choose from, including [people from a diversity of] sexual orientations when possible.”
- “BIPOC students [in her example overseas: African students and here: Native American/Indigenous] need each other, too, not just the mentors; they need a cohort.” In her experience of one program, “they have too many gringo mentors; maybe an exchange program would fix that!”

Two additional considerations related to representation were mentioned by participants. Not all representative mentorship relationships were deemed supportive by interview participants. One interviewee shared that her Black friend had a bad experience with a Black female boss. “There’s such a paucity of us in the field that it is instant competition” and that “she should have had my back the most but had my back the least.” Regarding gender representations, many of the participants noted they had perfectly good and useful mentorships with men throughout their careers (Drury et al., 2011; Eby et al., 2008).

FINAL RECOMMENDATIONS

Field station personnel tend to be problem solvers as a normal extension of their duties, and this interview process elicited many direct recommendations regarding the ways to promote and improve mentorship practices at FSMLs. We provide five recommendations below: develop formal and informal opportunities for networking; develop a blueprint/best practices document; training for mentors; create a field station leadership mentorship team; and reward systems.

Develop Formal and Informal Opportunities for Networking

The majority of respondents felt that frequent informal and/or formal scheduled sessions with peers in the OBFS network would be an excellent tool for

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bridging the gap in access to peer mentoring. Many respondents shared some of the mentoring networks opportunities they had been using. Some comments: "OBFS has been a huge source of mentorship"; "I would like more formal opportunities to be mentored or provide mentorship [from my career stage, mid-career]"; "[I] would like more opportunities to be mentored, [and it is] harder to find [mentorship] in leadership positions"; and "if we set up an OBFS mentorship panel [and] break it down into segments of topics so it does not feel like a life commitment, topics like fundraising, finance, science communication, etc. [would be helpful for building formal mentorship networks]."

A majority of respondents felt that FSMLs are so unusual that peer-to-peer mentoring is one of the better solutions/tools. Several respondents stated that they had a cadre of informal "one-off" mentors that they could reach out to for very specific needs. Getting targeted advice on things such as leadership, budgeting, running a business, science communication, grant writing, human resources, project management, and operations was listed as important for success in the "jill of all trades" world of field station management.

Develop a Blueprint/Best Practices Document

Several respondents mentioned examples of ongoing programs using best practices for resources such as written mentor-mentee contracts and "mentorship start-up packages." In general, these resources were used to establish baseline expectations for both parties in the mentoring relationships. As mentioned previously, these best practices documents can set the tone and structure for the mentor-mentee relationship so that everyone is held accountable.

Training for Mentors

Mentorship training was brought up by approximately 60% of the respondents as needed. Most good mentors became that way either through having guidance from other good role models, from learning what *not* to do from bad mentors, or as a result of formal or informal training. Several respondents also mentioned their role in being a boss automatically included some mentorship responsibilities. As noted by one interviewee: "Manager versus mentor, like, what's the difference between those two? And how can you fill both of those roles?"

The ability to obtain training throughout one's career to provide good mentorship is seen as a professional development need that underscores the changing needs of mentees as their career progresses (see chapter 6 by McDermott & May in this edited volume). Mentoring grows and

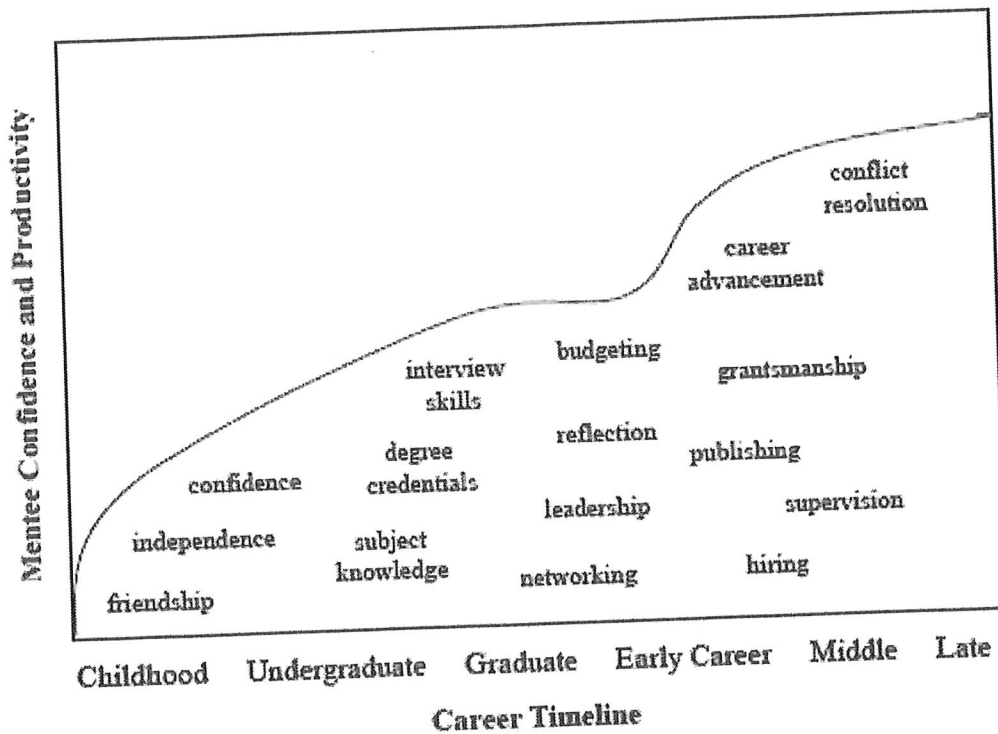


Figure 8.1 Skills and Attributes Accumulated from Mentoring Build Increased Mentee Confidence and Productivity along a Career Trajectory. Source: Author data.

strengthens mentee's skills throughout their career from the accumulation of knowledge and independence early in their development to interview skills, grantsmanship, and conflict resolution during their career. These attributes build mentee confidence and the skills to successfully navigate challenging personnel, budgetary, and competitive situations needed in leadership positions (figure 8.1).

Create a Field Station Leadership Mentorship Team

In addition to the formal and informal networking, participants mentioned having a mentorship team within professional societies to provide additional professional support and development. For example, as one participant stated, "Hav[ing] a set of worker bees in OBFS with lots of experience willing to mentor new field station directors by conducting a site visit like a planning grant" may be helpful. Five senior people and five younger people could do a road tour of some field stations to share what has worked well and what has not worked for directors in the past. The participant went on to suggest that the mentorship team could be part of the "FSML Planning grant process" and could even be written into a planning grant to formalize the potential program.

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Reward Systems

FSMLs are challenged to consider how to "compensate" mentors for their time, energy, and overall contribution to employee development and retention. Most interviewees said *emphatically* that mentors *should not be paid* and that an exchange of money would alter the dynamic too much. In fact, one or two respondents felt paying mentors would incentivize them to take on more mentees than they could handle. Although payment between mentees and mentors was discouraged, most interviewees verbalized that mentoring should be officially recognized as part of their job duties and that time should be carved out for successful mentorship. The establishment of a certification program or training module that could indicate externally both to employers and potential mentees that one had sought out and received training in mentorship was listed by some respondents as not only a useful tool but also as a way to be recognized. OBFS or other organizations could provide that training to build a community of effective mentors and mentees.

Several respondents mentioned that they tended to be mentors for young students coming to the field stations, for faculty setting up experiments, and generally for anyone trying to do science at field stations. One respondent said, "It would be nice if it [mentorship] was recognized as a job component; especially when it comes to writing recommendations which can take a lot of time. [It should be] recognized that is actually a valuable role that they play." What are other institutional ways to recognize mentoring? Universities are beginning to recognize that mentorship is critical to student success, and as a result, they are creating paid mentorship coordinating jobs (e.g., the Center for Coastal and Marine Science in California Lead Mentor) and official recognition of outstanding service in mentoring. One example is the *Curtis Wood Mentoring Award* at Western Carolina University that recognizes graduate student mentoring by faculty members. One respondent mentioned the mentorship program run by the Association of Nature Center Administrators as an excellent program that should be explored, "They have an official mentor-mentee program. Great model."

LIMITATIONS AND FUTURE RESEARCH

Although this research provides valuable insight into the role and value of mentorship in women's careers and experiences at FSMLs, there were some limitations. The instrument created and the working pool of interview subjects can introduce bias into a research process. In this case, the interviewer knew all the respondents, which made it possible to have rapport but could have easily introduced bias, even a positive bias. The size of the pool (16) is adequate but it only represented a small portion of U.S. and international field

station leaders. Finally, the lead-off question took up a lot of time that was then not available for exploring tactics in mentoring.

Therefore, in light of the research limitations, future research should be explored to continue this line of inquiry. Research could be conducted before, during, and after informal or formal group mentoring or mentoring training sessions. The introduction of both formal and informal opportunities for mentorship and training should be accompanied by informal or formal assessment tools from surveys to interviews. Future work should curate and collate the many programs in existence that provide mentorship training and opportunities and more clearly identify gaps and barriers to participation. Federal, state, and private funding is beginning to address the need for people of all backgrounds and gender identities to have access to mentorship opportunities; however, an evaluation of the success of these programs and the creation of a community of practice may be effective next steps.

CONCLUSIONS AND NEXT STEPS

The quote that best summarizes the participants' responses to the value of mentoring was, "*You can pick your ancestors, they don't all have to be the people related to you.*" We all need mentors, and in many cases, our success is incredibly dependent on finding the right people at the right time in our careers. Fortunately, some people are able to find mentors and act as mentors without too much difficulty. But that is not the case for all people. Barriers exist, especially for women and doubly so for BIPOC women (Grogan et al., 2021). In the world of field science, remoteness, limited staff, and a busy and varied workload all create obstacles for obtaining mentorship opportunities. Fortunately, the strong peer-to-peer network nurtured by the OBFS, within the science community, and through other professional organizations may remove some of these obstacles.

Appendix: Interview Questions

1. Tell me a little bit about yourself: How would you describe yourself to the young daughter of a colleague?
2. What is your definition of mentorship?
3. What are the defining characteristics of a meaningful mentorship from the perspective of the mentor and mentee? What are the key things in your mind that define a "good" or effective mentorship?
4. Reflecting on your experiences with mentorship, how have you benefited as a mentor and mentee? If they struggle here, encourage them to share a meaningful mentor relationship and how it impacted them.

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5. How has mentorship impacted your career from degree completion to where you are now?
6. How has your need for mentorship changed over the duration of your career? Examples: starting a career, mid-way through degree, starting teaching, starting a new job, toward the end of the degree path (when burnout might be more common)?
7. How available have mentors been throughout your career? Have there been times where you needed mentorship and could not find a mentor or did not have that option?
8. What do you look for in a mentor?
9. Can you describe a time when a good mentor really helped you?
10. Have you encountered a bad mentor? What traits or actions made them a bad fit for you?
11. Have you experienced a difficult time mentoring someone? What traits or actions made that the case?
12. Your Mentorship styles:
 - a. How often do you meet?
 - b. How long are your mentoring sessions?
 - c. How long do you maintain a mentor-mentee relationship?
 - d. How do you communicate your willingness to mentor?
 - e. Have you ever turned down a mentorship opportunity? Why?
13. What tools or technologies do you utilize to initiate and to maintain a mentor-mentee relationship? How much has this changed post-COVID?
14. What tips would you give someone starting in a mentorship (either as the mentor or mentee)?
15. Would you like more formal opportunities to be a mentor or be mentored?
16. What barriers have you experienced in the past regarding mentorship?
17. Do you feel mentors should be paid?
18. Does your institution reward mentorship service?
19. Do you tend to mentor the same way you have been mentored?
20. Do you seek out people like you as mentors?
21. How important is representation in mentorship, that is, women mentoring other women, people of color mentoring people of color, etc.?
22. What else would you like to add about your mentorship experiences?

REFERENCES

- Bernard, R. E., & Cooperdock, E. H. G. (2018). No progress on diversity in 40 years. *Nature Geoscience*, 11(5), 292–295. <https://doi.org/10.1038/s41561-018-0116-6>

- Billick, I., Babb, I., Kloeppel, B., Leong, J., Hodder, J., Sanders, J., & Swain, H. (2013). *Field stations and marine laboratories of the future: A strategic vision*. https://www.obfs.org/assets/docs/fsml_final_report.pdf
- Blickenstaff, J. C. (2005) Women and science careers: Leaky pipeline or gender filter? *Gender and Education*, 17(4), 369–386. <https://doi.org/10.1080/09540250500145072>
- Boag, A. E., & Chardon, N. I. (2021, February 1). Improving the advisor/advisee relationship academic mentors are not necessarily natural managers. Their graduate students often bear the brunt of this shortcoming. *The Scientist*. <https://www.the-scientist.com/critic-at-large/improving-the-advisor-advisee-relationship-68352>
- Brandimarte, L., Acquisti, A., & Loewenstein, G. (2010, June). *Misplaced confidences: Privacy and the control* [Symposium]. Ninth Annual Workshop on the Economics of Information Security, Harvard University, Cambridge, MA.
- Buzzanell, P. M., Long, Z., Anderson, L. B., Kokini, K., & Batra, J. C. (2015). Mentoring in academe: A feminist poststructural lens on stories of women engineering faculty of color. *Management Communication Quarterly*, 29(3), 440–457. <https://doi.org/10.1177/0893318915574311>
- Chandra, S., Candace, C. A., Huebert, A., Crowley, E. C., & Das, A. M. (2019). Impostor syndrome: Could it be holding you or your mentees back? *CHEST*, 156(1), 26–32. [https://journal.chestnet.org/article/S0012-3692\(19\)30607-5/pdf](https://journal.chestnet.org/article/S0012-3692(19)30607-5/pdf)
- Corbin, J., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13(1), 3–21. <https://doi.org/10.1007/BF00988593>
- Davies, S. W., Putnam, H. M., Ainsworth, T., Baum, J. K., Bove, C. B., Crosby, S. C., Côté, I. M., Duploux, A., Fulweiler, R. W., Griffin, A. J., Hanley, T. C., Hill, T., Humanes, A., Mangubhai, S., Metaxas, A., Parker, L. M., Rivera, H. E., Silbiger, N. S., Smith, N. S., ... Bates, A. E. (2021). Promoting inclusive metrics of success and impact to dismantle a discriminatory reward system in science. *PLoS Biology*, 19(6), e3001282. <https://doi.org/10.1371/journal.pbio.3001282>
- Debinski, D. (2022). Make the approach and get the data: Challenges, teamwork, and culture of support for women who are scientists and parents at field stations and marine labs. In V. McDermott, J. Gee, & A. R. May (Eds.), *Women of the wild: Challenging gender disparities in field stations and marine laboratories* (pp. 53–88). Lexington Books.
- DeCastro, R., Sambuco, D., Ubel, P., Stewart, A., & Jagsi, R. (2013). Mentor networks in academic medicine: Moving beyond a dyadic conception of mentoring for junior faculty researchers. *Academic Medicine*, 88(4), 488–496. <https://doi.org/10.1097/ACM.0b013e318285d302>
- Dennehy, T. C., & Dasgupta, N. (2017). Female peer mentors early in college increase women's positive academic experiences and retention in engineering. *Proceedings of the National Academy of Sciences of the United States of America*, 114(23), 5964–5969. <https://doi.org/10.1073/pnas.1613117114>
- Drury, B. J., Siy, J. O., & Cheryan, S. (2011). When do female role models benefit women? The importance of differentiating recruitment from retention in STEM.

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- Psychological Inquiry*, 22(4), 265–269. <https://doi.org/10.1080/1047840X.2011.620935>
- Dumas, T. N. (2020). Effective mentoring for diverse leaders. In D. S. Chapman & A. Wilkerson (Eds.), *From student to scholar: Mentoring underrepresented scholars in the academy* (pp. 167–180). Palgrave Macmillan.
- Eby, L. T., & Allen, T. D. (2008). Moving toward interdisciplinary dialogue in mentoring scholarship: An introduction to the special issue. *Journal of Vocational Behavior*, 72(2), 159–167.
- Eby, L. T., Allen, T. D., Hoffman, B. J., Baranik, L. E., Sauer, J. B., Baldwin, S., Morrison, M. A., Kinkade, K. M., Maher, C. P., Curtis, S., & Evans, S. C. (2013). An interdisciplinary meta-analysis of the potential antecedents, correlates, and consequences of protégé perceptions of mentoring. *Psychological Bulletin*, 139(2), 441–476. <https://doi.org/10.1037/a0029279>
- Eby, L. T., Allen, T. D., Evans, S. C., Ng, T., & Dubois, D. (2008). Does mentoring matter? A multidisciplinary meta-analysis comparing mentored and non-mentored individuals. *Journal of Vocational Behavior*, 72(2), 254–267. <https://doi.org/10.1016/j.jvb.2007.04.005>
- Eby, L. T., Rhodes, J. E., & Allen, T. D. (2007). Definition and evolution of mentoring. In Allen, T. D., & Eby, L. T. (Eds.), *The Blackwell handbook of mentoring: A multiple perspectives approach* (pp. 7–20). Blackwell.
- Estrada, M., Hernandez, P. R., & Schultz, P. W. (2018). A longitudinal study of how quality mentorship and research experience integrate underrepresented minorities into STEM careers. *CBE - Life Sciences Education*, 17, 1–13. <https://doi.org/10.1187/cbe.17-04-0066>
- Fogel, M. L. (2020). *Advice from the Isotope Queen: Building a meaningful career while enjoying a full life*. Yaqui Gulch Press.
- Ford, H. L., Brick, C., Azmitia, M., Blaufuss, K., & Dekens, P. (2019). Women from some minorities get too few talks. *Nature*, 576, 32–35. <https://doi.org/10.1038/d41586-019-03688-w>
- Fridkis-Hareli, M. (2011). A mentoring program for women scientists meets a pressing need. *Nature Biotechnology*, 29, 287–288. <https://doi.org/10.1038/nbt.1799>
- Gaensler, B. (2018). It takes more than a vow. *Nature*, 558, 149–151. <https://media.nature.com/original/magazine-assets/d41586-018-05317-4/d41586-018-05317-4.pdf>
- Gray, P. W., & Jordan, S. R. (2012). Supervisors and academic integrity: Supervisors as exemplars and mentors. *Journal of Academic Ethics*, 10, 299–311. <https://doi.org/10.1007/s10805-012-9155-6>
- Greco, V. (2014). Establishing an academic laboratory: Mentoring as a business model. *Molecular Biology of the Cell*, 25(21), 3251–3253. <https://doi.org/10.1091/mbc.E14-06-1079>
- Grogan, P., Eviner, V., & Hobby, S. (2021). Keeping up with the times: Equity issue is now added to our self-reflection worksheet for improving scientific mentoring. *Bulletin of the Ecological Society of America*, e01841. <https://doi.org/10.1002/bes2.1841>

- Guillemin, M., & Heggen, K. (2009). Rapport and respect: Negotiating ethical relations between researcher and participant. *Medicine, Health Care, and Philosophy*, 12(3), 291–299. <http://dx.doi.org/10.1007/s11019-008-9165-8>
- Halvorson, M. A., Finney, J. W., Bi, X., Maisel, N. C., Hayashi, K. P., Weitlauf, J. C., & Cronkite, R. C. (2015). The changing faces of mentorship: Application of a developmental network framework in a health services research career development program. *Clinical and Translational Science*, 8(6), 824–829. <https://doi.org/10.1111/cts.12355>
- Herrmann, S. D., Adelman, R. M., Bodford, J. E., Graudejus, O., Okun, M. A., & Kwan, V. S. Y. (2016). The effects of a female role model on academic performance and persistence of women in STEM courses. *Basic and Applied Social Psychology*, 38, 258–268. <https://doi.org/10.1080/01973533.2016.1209757>
- Higgins, M. C., & Thomas, D. A. (2001). Constellations and careers: Toward understanding the effects of multiple developmental relationships. *Journal of Organizational Behavior*, 22, 223–247. <https://doi.org/10.1002/job.66>
- Huang, G., Taddese, N., & Walter, E. (2000). *Entry and persistence of women and minorities in college science and engineering education*. National Center for Education Statistics, U.S. Department of Education. <https://files.eric.ed.gov/full-text/ED444872.pdf>
- Inzer, L. D., & Crawford, C. B. (2005). A review of formal and informal mentoring: Processes, problems, and design. *Journal of Leadership Education*, 4(1), 31–50.
- Langford, J., & Clance, P. R. (1993). The impostor phenomenon: recent research findings regarding dynamics, personality and family patterns and their implications for treatment. *Psychotherapy: Theory, Research, Practice, Training*, 30(3), 495–501. <https://doi.org/10.1037/0033-3204.30.3.495>
- Lindlof, T. R., & Taylor, B. C. (2017). *Qualitative communication research methods*. Sage publications.
- Long, Z., Buzzanell, P. M., Kokini, K., Wilson, R. F., Batra, J. C., & Anderson, L. B. (2018). Mentoring women and minority faculty in engineering: A multi-dimensional mentoring network approach. *Journal of Women and Minorities in Science and Engineering*, 24(2), 121–145. <https://doi.org/10.1615/JWomenMinorScienEng.2017019277>
- Makarova, E., Aeschlimann, B., & Herzog, W. (2019). The gender gap in STEM fields: The impact of the gender stereotype of math and science on secondary students' career aspirations. *Frontiers in Education*, 4. <https://doi.org/10.3389/educ.2019.00060>
- McDermott, V., & May, A. (2022). From the standpoint of women FSML directors: Communication, leadership, and the impact of gender norms. In V. McDermott, J. Gee, & A. R. May (Eds.), *Women of the wild: Challenging gender disparities in field stations and marine laboratories* (pp. 115–142). Lexington Books.
- Méndez-Morse, S. (2004). Constructing mentors: Latina educational leaders' role models and mentors. *Educational Administration Quarterly*, 40(4), 561–590. <https://doi.org/10.1177/0013161X04267112>

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- Merriweather, L. R., & Morgan, A. J. (2013). Two cultures collide: Bridging the generation gap in a non-traditional mentorship. *Qualitative Report*, 18(12), 1–16. <https://files.eric.ed.gov/fulltext/EJ1005008.pdf>
- Montgomery, B. L. (2017). Mapping a mentoring roadmap and developing a supportive network for strategic career advancement. *SAGE Open*, 7(2), 1–13. <https://doi.org/10.1177/2158244017710288>
- Neely, A. R., Cotton, J., & Neely, A. D. (2017). E-mentoring: A model and review of the literature. *AIS Transactions on Human-Computer Interaction*, 9(3), 220–242. <https://aisel.aisnet.org/thci/vol9/iss3/3>
- Packard, B. W. (2003). Web-based mentoring: Challenging traditional models to increase women's access. *Mentoring and Tutoring*, 11(1), 53–65. <https://doi.org/10.1080/1361126032000054808>
- Ragins, B. R. (2010). Relational mentoring: A positive approach to mentoring at work. In K. S., Cameron, & G. M., Spreitzer (Eds.), *The handbook of positive organizational scholarship* (pp. 519–536). Oxford University Press.
- Saldaña, J. (2013). *The coding manual for qualitative researchers*. Sage.
- Saxena, M., Geiselman, T. A., & Zhang, S. (2019). Workplace incivility against women in STEM: Insights and best practices. *Business Horizons*, 62(5), 589–594. <https://doi.org/10.1016/j.bushor.2019.05.005>
- Scheinert, R. (2015). The science of mentoring women in science. *The NIH Catalyst*, 23(2), 6–7. https://irp.nih.gov/sites/default/files/catalyst/catalyst_v23i2.pdf
- Steele, R. G. (2013). The social construction of professional mentorship. *Journal of Pediatric Psychology*, 38(2), 126–131. <https://doi.org/10.1093/jpepsy/jss177>
- Straus, S. E., Johnson, M. O., Marquez, C., & Feldman, M. D. (2013). Characteristics of successful and failed mentoring relationships: A qualitative study across two academic health centers. *Academic Medicine: Journal of the Association of American Medical Colleges*, 88(1), 82–89. <https://doi.org/10.1097/ACM.0b013e31827647a0>
- Struminger, R., Adame, G. M. V., & Shannan, Y. H. (2022). Women's perspective on building international community-field station partnerships. In V. McDermott, J. Gee, & A. R. May (Eds.), *Women of the wild: Challenging gender disparities in field stations and marine laboratories* (pp. 225–254). Lexington Books.
- Struminger, R., Zarestky, J., Short, R. A., & Lawing, A. M. (2018). A framework for informal STEM education outreach at field stations. *BioScience*, 68(12), 969–978. <https://doi.org/10.1093/biosci/biy108>
- Wanberg, C. R., Kammeyer-Mueller, J., & Marchese, M. (2006). Mentor and protégé predictors and outcomes of mentoring in a formal mentoring program. *Journal of Vocational Behavior*, 69(3), 410–423. <https://doi.org/10.1016/j.jvb.2006.05.010>
- Yun, J., Baldi, B., & Sorcinelli, M. (2016). Mutual mentoring for early-career and underrepresented faculty: Model, research, and practice. *Innovative Higher Education*, 41(5), 441–451. <https://doi.org/10.1007/s10755-016-9359-6>