

Variations in Mentorship Across Grade Levels and Career Stages Among Public Management Professionals

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Abstract

Mentoring is important to career development and employee morale of public sector employees, but little is known about how employee mentoring needs change over the course of one's career or at different job classification levels. An online survey about the mentoring needs of 251 aquatic professionals in the USDA Forest Service was conducted in 2019. Quantitative data were analyzed across three federal employee grade levels and four career stages. This study found that grade levels influenced the type of skills employees seek to develop and the attributes associated with successful mentoring. Employees in lower grade positions believed that mentoring would help them to achieve a faster promotion or prepare them for a new position, but they also had less access to mentors and received the least encouragement from their supervisors to seek mentoring. Employees at all career stages believed that mentoring was valuable to their professional growth, while middle- and late-career employees received less encouragement from their supervisor to seek a mentor. Differences in mentorship needs, access, importance, and structures across career stages and grade levels suggest potential areas of future development or intervention to expand the benefits of mentoring to all employees.

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Introduction

Support of mentoring relationships has long been viewed as a strategy to improve employee satisfaction, promote professional development, and enhance the potential for promotion and career advancement, which in turn contributes to greater workforce retention and improved morale (Allen et al., 2017). Mentoring has also been used as a strategy to provide avenues for women and employees of color to advance through their organizations (Daley, 1996). Traditional mentoring models paired a higher-level or more experienced employee (mentor) with an early-career employee (mentee or protégé) to provide the mentee career opportunities (e.g., sponsorship, exposure, and visibility) and psychosocial support (e.g., listening, acceptance, role modeling, and confirmation; Kram, 1983). While this model remains pervasive, new forms of mentoring, such as peer mentoring and reverse mentoring, reflect changing ideas of learning and workforce values (Mullen & Klimaitis, 2021). In the United States, public and private sector agencies have invested in mentoring programs to improve the work environment and to promote equitable pathways to growth and development (Neal et al., 2022). Mentoring is acknowledged as an accepted approach to enhance retention and is cost-effective, relying on existing professional networks. While mentoring research has focused on demographic characteristics such as gender or race (Cerveny et al., 2023; McIlongo & Strydom, 2021; Penaluna et al., 2020), few studies have explored other background factors, such as career status or age (Allen et al., 2017).

Despite the stock placed in mentoring, much of the previous research has been done in educational and business settings and less is known about mentoring programs in public management, including organizations such as federal and state agencies (Bozeman & Feeney, 2007). In the public sector, mentoring has been implemented as a tool associated with new employee orientation (onboarding), grooming employees into leadership positions, and for mitigating knowledge loss from planned employee transitions. Yet, there is increasing recognition that employees can benefit from mentors at a variety of career stages, including transitioning to a new position, the acquisition of new roles or responsibilities, shifting duty stations, promotion from team member to supervisor, or project leader to program leader (Mullen & Klimaitis, 2021). Mentoring has been recognized as an effective way to provide support and expand professional networks for employees who may be under-represented, marginalized, or in isolated settings (Neal et al., 2022). If mentoring is being considered as a strategy for employee advancement and empowerment in public agencies, more information is needed about the varying needs of public sector employees and whether opportunities are equally distributed across the workforce.

The developmental needs of employees may change over the course of their career and as they are promoted to a higher grade position, yet little is known about the nature of these changing needs for mentoring (Carden, 1990; Ornstein & Isabella, 1993). This

gap in understanding leads one to pose several questions relevant to public sector employees. How do rates of mentoring participation and skills sought by mentees for development vary by grade level and career stage? How do instrumental outcomes (e.g., employee satisfaction, retention) and psycho-social outcomes vary for mentees at different career stages and grade levels? Finally, are there different structural needs for implementing a mentorship program? These questions motivated us to explore mentoring gaps and needs across career stages and grade levels in a public agency.

This study focuses on the USDA Forest Service (USFS) to understand more about employee perceptions of mentors, the mentoring relationship, and agency provision of mentorship programs and opportunities. The USFS represents an exemplary case study to understand mentoring because of its hierarchical structure typical of specialized public sector agencies (Kaufman, 1960). This study examines survey data of agency fish biologists, aquatic ecologists, and others with a background in aquatic fields (hereafter “aquatic professionals”) from the USFS to understand similarities and differences in mentoring needs across four career stages (early-career, early-mid, late-mid, and late-career) and three grade-level groupings (entry-level, mid-level, and top-level). The investigation is especially focused on exploring employees across career stages and grade levels to understand variations in (a) employee engagement in mentorship; (b) employee needs for mentorship (skills they desire to enhance); (c) employee needs for mentors (qualities they seek in a mentor); (d) mentoring outcomes; and (e) access to mentors. Findings will help public agencies consider whether their existing and future mentorship approaches are catering to the variety of needs of employees across career stages and tenures within an agency. This study sheds light on mentoring needs with real implications for other public management agencies.

Literature Review

Mentorship as an Employee Development Strategy

Knowledge development around mentoring has hailed from several professional disciplines including education, management, and human resources, with theory development primarily stemming from various sub-fields of psychology (organizational, industrial, and vocational). While the lack of rigor in defining and operationalizing mentorship has been noted (Crow, 2012), contemporary notions of mentoring derive from Kram’s (1983) definition, which described mentoring as a relationship between a senior mentor and a junior protégé geared toward employee development. This relationship is sometimes referred to as the mentoring “dyad” and early constructs emphasized this as a one-way learning relationship (Kram, 1983; Mullen & Klimaitis, 2021). Mentoring has both an instrumental function (to improve employee satisfaction and morale and to promote productivity and retention) and a psychosocial function (to provide employee support, career advice, and role modeling; Kram, 1983). Some have subsequently clarified that mentoring is a relationship where guidance has been explicitly sought, which extends over a long duration (Clutterbuck et al., 2017; Mullen & Fletcher, 2012), and that can be either formal (facilitated by the organization)

or informal (organically derived; Allen et al., 2017; Kram, 1983). While this early conceptualization of mentoring was established as a norm, other mentoring roles have been developed in recent years that challenge implicit power differentials associated with the traditional mentoring dyad. Emerging models often embody mutual (two-way) learning, which includes peer mentoring, co-mentoring, reverse mentoring, collaborative mentoring, cultural mentoring, and group mentoring, among others (Mullen & Klimaitis, 2021).

Drawing from organizational theories, mentoring may be considered in the context of management function within an organizational system. Mentoring can help to achieve what Chester Barnard described as the most important function of an executive to communicate an organization's goals, create a shared set of values, and encourage alignment and cooperation of the workforce (Barnard, 1938). Through role modeling, teaching, and instilling a sense of values and ethics, mentors can contribute to an organization's human capacity. Moreover, mentoring allows an organization to balance individual needs for professional development with an organization's need for effectiveness (Barnard, 1938). In his 14 principles of management, Fayol (1978) also emphasized the importance of attention to a firm's obligations to employees and the need to encourage "unity in direction" by asking upper managers to set an example through role modeling. Mentorship is one way for senior employees to inculcate a shared sense of ethics, norms, and desired behaviors. "Stability of employee tenure" is another of Fayol's management principles that can be addressed by mentoring and employee development. Mentoring is used as a strategy for employee orientation and onboarding, employee development and long-term retention, and institutional knowledge transfer (Allen et al., 2004).

Research on mentorship has shown that it provides a variety of functions to the organization, including career development, psychosocial support, and role modeling (Coppin & Fisher, 2015; Wanberg et al., 2003). Existing research has shown that employees who have been mentored at some point in their careers report higher levels of job satisfaction, and greater likelihood of promotions compared with those without mentors (Allen et al., 2008; Penaluna et al., 2020). Chao and Walz (1992) identified five potential outcomes for proteges that result from mentoring: promotions and lateral moves, increased visibility, career advancement, protection from adverse forces, and professional development. Mentors also may impart specialized knowledge to help employees navigate their organization or plan their career trajectory (Allen et al., 2004). Mentors provide psychosocial support to protégés through the enhancement of their sense of confidence and self-efficacy, expanding their development networks (Kram, 1983). Mentoring has also been associated with learning and the acquisition of new skills as well as enhanced organizational citizenship (employee actions that benefit the organization; Chao et al., 1994; McManus & Russell, 1997).

Mentoring scholarship has been critiqued for a lack of an integrated theoretical trajectory or research model (Bozeman & Feeney, 2007) consisting primarily of isolated, "one-off" studies (Bozeman & Feeney, 2007; Haggard et al., 2011; Mullen & Klimaitis, 2021). Haggard et al. (2011) found that research in the 1980s focused on mentoring definitions and explored the link between mentoring and positive career

outcomes. In the 1990s, research dealt with identifying mentoring costs, benefits, and barriers, isolating qualities of an effective mentor, understanding differences between formal and informal mentoring, delineating phases of the mentoring relationship, exploring psycho-social outcomes of mentoring, and identifying benefits to women and minorities (Haggard et al., 2011). In the 2000s, research focused on how mentors are selected, the experiential aspects of mentoring, and the classification of alternatives to mentoring (Mullen & Klimaitis, 2021). While progress has been made in identifying alternate forms of mentoring relationships, little work has been done to tease out how mentorship can be contextual, dynamic, or relational, and no attention has been given to the changing needs of mentees over the span of their career.

Previous studies have explored mentoring roles, relationships, and outcomes of all employees at a point in time without specifically identifying changing needs over the career. Mentorship at early career stages may look different from middle and late-career stages because the scope and scale of collaboration and performance of employees can vary (Hu et al., 2014). When seasoned employees face a “career plateau,” psychosocial support and role modeling from mentors can help to overcome the situation and motivate employees to continue serving the organization and being productive (Wang et al., 2014). In addition, the role of mentors may vary depending on one’s position in the organization (entry level vs. senior level). Mentoring commonly appears as an accompaniment to agency-sponsored leadership training programs geared toward up-and-coming leaders (Crisp & Alvarado-Young, 2018; Stead, 2005). Less is known about how mentoring is used for employees in middle grades or at the middle stages of their careers, particularly in the context of public management.

While research on mentoring in the private and educational sectors is relatively abundant, empirical evidence about mentoring in public management settings remains slim. Public managers are distinct from private entities because public employees are connected to “diverse networks of responsibility and accountability that spread across the employing agency and . . . other governmental bodies including courts, executives, and legislative bodies; and ultimately, voters and citizens” (Bozeman & Feeney, 2009, p. 145). While studies that measure mentoring outcomes in the private sector focus on salary increases or promotions, public sector employees are differently motivated, with a greater focus on public service and external goals, suggesting that mentoring outcomes are diversified (Christensen et al., 2017). A study of mentoring of early career fish biologists in a public natural resource management agency found that mentoring was associated with greater job satisfaction and career development and that mentors helped instill ethics and commitment to service, among other factors (Kennedy & Roper, 1990). In their review of public sector mentoring, Bozeman and Feeney (2009) identified numerous federal and state agency mentoring programs, emphasizing the importance of mentoring for improving agency commitment, workforce retention, leadership development, and knowledge transfer. They propose a three-tier model for public sector mentoring that includes an emphasis on improved human capital, enhanced opportunities for employees in all demographic categories, and enhanced public service motivation (Bozeman & Feeney, 2009). Across all federal agencies, mentoring has been viewed as a viable strategy for increasing diversity and inclusion, although less is

known about whether it actually achieves these goals (Sabharwal, 2014). Mentoring for leadership has been shown to positively impact career development for women in the public sector (McIlongo & Strydom, 2021). A study of USFS aquatic professionals showed that mentorship is associated with employees feeling valued and challenged in their jobs but also found that female employees sought different attributes in mentors and were less satisfied with mentoring than male counterparts along several critical outcomes (Cervený et al., 2023). These studies suggest that mentoring offers benefits to public sector employees, but mentoring needs may not be homogeneous across the workforce and mentoring outcomes may not be universally realized.

Employee Development Across Career Stages

To help us understand variations in employee needs across the career-span, this study looked at classic career development models, based on adult learning theory, which shows that the roles, functions, motivations, choices, and needs of professionals change or evolve during their careers. “Career stage” has been defined and operationalized in various ways, with measures using employee age, organizational tenure, and position tenure, which complicates research on this topic (Allen & Meyer, 1993). Early models were rather linear in nature. Super et al.’s (1980) classic model depicts the developmental aspirations of employees through four stages: *exploration* stage (training, education, and investigating career options that match employee interests); the *establishment* stage (demonstrating competence and success and finding their niche), *maintenance* stage (continued productivity and pursuit of strategies to improve performance and update skills, while maintaining work-life balance); and the *disengagement* stage (stepping back in preparation for separation or retirement; Super et al., 1980). Others have built on these models, adding or refining career stages. Hall and Mirvis (1995) posit that career phases are reflected by multiple, shorter learning cycles over the life span. Along with Smart and Peterson (1997), they support the idea of continual learning and “recycling” (returning to early career stages).

While Super et al.’s (1980) model and various revisions draw attention to changing employee needs over time, they are critiqued for being overly simplistic, linear, and reductionistic. Moreover, these models assume that employee views of success are measured by compensation and promotion rather than satisfaction or independence. Notably, these early studies were conducted in hierarchical organizations where long-term loyalty is rewarded with job security (Sullivan, 1999). Early research on employee career stages lacked females and subsequent models were found to be insufficient for explaining the career stages of female employees (Ornstein & Isabella, 1990; Smart & Peterson, 1994). Research to explore career phases for women identified additional factors to be important, including career and personal achievement and family and personal relationships (Brush, 1992; Powell & Mainiero, 1992). It is expected that employee experiences may be more nuanced, cyclical, punctuated, and regressive, depending on circumstances. While imperfect, the models provide insights into the changing needs of employees over their career span.

Levinson (1986) explored career stages based on psychological orientations, which are said to affect career aspirations. Levinson uses age as a proxy for career stage and describes two major career stages, “early adulthood” (aged 20–40 years) where establishing personal identity and independence are paramount, “middle adulthood” (aged 40–60), where a deeper values system is developed based on retrospection and experience. Within these broad phases are sub-phases that are characterized as a punctuated equilibrium mode, where there are longer (5–7 years) phases of consistency interrupted by shorter periods of intense change or reappraisal of values and work-life priorities. The underlying assumption is that at different career stages, employees have different needs. Lee (2020) built on Levinson’s model to explore factors associated with employee satisfaction in the U.S. federal workforce. Early career employees were found to care more about career advancement, workload, and intrinsic motivation (match with their job) than senior employees.

Arthur and Rousseau (1996) investigated career phases in more contemporary firms that are less hierarchical, more transitory, and where the goal is less about loyalty and more about performance and flexibility. Their “Boundaryless Career Model” recognizes the importance of peer learning, on-the-job learning, transferable skills, and continual training. The model describes five types of significant transitions: *occupational boundary transitions* (shift into a new occupation), *organizational boundary transitions* (shift into a new firm or agency), *transitions in employment relationships*, (change in work terms or contracts, such as telework), *changes in networks* (shift in a social capacity and renegotiation of social relations), *interrole transitions* (promotion, demotion or lateral move), and *intra-role transitions* (change in the scope of work) (Sullivan, 1999). Each transition type suggests a different set of needs and opportunities for mentoring. Given the different developmental aspirations and priorities, it may be posited that employees in these different career stages might seek mentoring relationships for different purposes (Baugh & Scandura, 1999). Current research in employee development has shifted away from a focus on career stages, likely due to the changing nature of the “career” as a construct that implies a continuous and connected trajectory. In addition, there has been a dramatic shift in workplace norms to favor frequent employee transitions, continuous employee development through temporary or long-term position reassignments, position restructuring, hybrid workplace models, and more. While these trends are continuing to evolve in the private sector, changes in career patterns in public management have been more gradual.

Organizational and Policy Context: USDA Forest Service

The USDA Forest Service (USFS) is a sub-agency of the U.S. Department of Agriculture charged with managing the system of forests and grasslands across the United States for multiple uses, including timber, grazing, mining, recreation, heritage, fish and wildlife, clean water, clean air, soils, carbon and more. The USFS is primarily a hierarchical agency, with authority stemming from the Washington Office to nine Regional Offices and down to individual field units, with authority at each level (Kaufman, 1960; Sabatier et al., 1995). The agency also is organized around different programmatic units and

technical specializations, which coordinate across regions and levels to share information. These programs can serve as a disciplinary home for specialists scattered across the agency and its deputy areas. Within this structure, employees in Research and Development provide science support to all levels of the organization.

The USFS makes an excellent case study for understanding the implications of mentoring as a tool for workforce development because advancement occurs along a clear set of pathways. The USFS workforce comprised roughly 28,424 employees in 2022 (USDA Forest Service, 2023b). Most USFS professional positions (95%) are covered by the General Schedule (GS) classification and pay system, established by the Classification Act of 1949, which includes technical, professional, administrative, and clerical positions. The GS system is designed to standardize pay based on grade level (1 to 15) and step level (1 to 10). An employee's grade level is determined by the position description, while the step level is determined by tenure. Grades in the GS-1 to GS-7 range are considered entry-level positions; grades GS-8 to GS-12 are deemed mid-level positions, and top-level positions (senior managers as well as top-level technical specialists and scientists) are in the GS-13 to GS-15 range. Positions are assigned a grade based on their level of difficulty and the education or training required. For most GS-classified employees, one's position may be assigned to a fixed GS-level, or it may be a ladder position, allowing advancement based on acceptable performance and tenure. Employees also can advance by working for several years in-grade and then applying for a higher GS-level position. Experience also can be gained through short-term "detail" opportunities in higher-grade positions. (Research-grade scientists advance using a panel process to evaluate their position.) In the USFS, one's GS-level can be indicative of career length (number of years in the agency or the workforce) or position status (entry-level, mid-level, and top-level), or both.

This study was instigated by the publication of "Rise to the Future: National Fish and Aquatic Strategy," led by the USFS National Fisheries Program which identified mentoring as integral to a highly skilled, motivated, and diverse workforce. Mentoring was seen as a strategy to enhance employee engagement and empowerment for early and mid-career aquatic professionals (Shively et al., 2018). The USFS National Fisheries Program has held a long-term interest in employee development for aquatic professionals. In the 1980s, aquatic professionals were relative newcomers to the USFS workforce, which had been dominated by timber and fire professionals and engineers (Brown & Harris, 1993). In effort to understand the experiences of early career fish biologists, a study was conducted in 1989 about the role of mentoring as a means to enhance career advancement and employee satisfaction (Kennedy & Roper, 1990). This study was designed to provide a longitudinal assessment of early career fish biologists, following up on the 1989 study, and the sample was also expanded to include a broader range of aquatic professionals across the career-span. Mentoring was linked to job satisfaction for fish biologists, and employees of color in particular sought mentors for confidence-building (Penaluna et al., 2020). Among the sample of aquatic professionals, gender differences were found in perceptions about the value of mentoring and mentor characteristics (Cervený et al., 2023). Mentoring has

been recognized as a critical component in addressing agency goals for a diverse and inclusive work environment as well as the agency's Equity Action Plan (USDA Forest Service, 2022). One year after this survey was conducted, the USFS formally introduced a National Mentoring Program open to all employees that worked to match interested proteges with mentors (USDA Forest Service, 2023a). The institutionalization of mentoring within the USFS suggests the agency's embracement of mentoring as one strategy to enhance the work environment.

Method

Survey and Data Collection

All USFS professionals were identified as being in the National Fisheries Program or who worked as fish biologists, aquatic (or fish) ecologists as well as regional and national program managers in the USFS, and fish biologists in Research and Development were invited to participate in an online survey. Following standard informed consent procedures, participants were reminded in the email invitation and on the survey landing page, that their participation was voluntary, and that their anonymity would be protected, noting that all results would be explored in the aggregate. By signing into the survey, participants agreed to participate in the study. The survey was forwarded to agency professionals in the aquatics program by the program leaders as per the original intention of reaching out to all employees of the targeted population. Apart from forwarding invitation emails, the program leaders were not involved in the research. The responses were directly recorded on a third-party survey site, so the program leaders did not know who had participated in the survey and who had not. With these measures to minimize the biases, it is likely that reaching out to the participants electronically through the program leaders did not influence the content of the answers. Survey participants had assumed different roles in the agency (e.g., program managers and line officers), but primarily worked in aquatic programs. There were no repercussions for nonparticipation, and there was no way of tracking which employees responded.

Using the SurveyMonkey platform, online surveys were deployed in 2019 in two, 4-week waves. An important goal was to ensure widespread response across the nine USFS regions to allow cross-regional comparisons. The first wave survey was conducted between April and May, resulting in 175 responses. In some USFS regions the response was perceived to be low during the first wave, so the second deployment was executed in July and August, which resulted in 76 additional responses. Thus, the usable sample size was 251. Because of the chain referral sampling approach used, a precise tally of the number of employees who received the survey link was unavailable, making it difficult to know the exact number in a sampling frame. It is estimated that 500 employees received the survey invitation, based on membership to internal agency email lists of aquatic professionals. Thus, the response rate could be estimated at roughly 50%. Completion times varied, but 61% of participants finished the survey in fewer than 20 min.

The survey was designed to include a set of questions about participation in mentoring programs and the benefits of mentoring that would be identical to the Kennedy

and Roper (1990) study, which would allow longitudinal analysis (See Penaluna et al., 2020). After deliberations, the research team added several new subsets of questions to address research interests and agency needs to better understand the role of mentoring in enhancing diversity and inclusion. Responses based on gender and race were described in Cervený et al. (2023). The scoping of new mentoring attributes (or “the range of skills”) was determined based on the literature review, the collective experience of the study team about the USFS workforce, and the information needs of the USFS. These new questions focused on mentoring needs, perceived satisfaction with mentoring, perceived mentoring outcomes, and agency approaches to mentoring. Of the 42 questions overall, the majority were fixed response items, including checklists or ordinal choices. The survey included background questions about employees’ position and role, satisfaction with work and their position, participation in mentoring, relationship with mentors, desired skills to enhance through mentoring, attributes sought in a mentor, satisfaction with the mentoring experience, perceptions of mentoring benefits, and indicators of successful mentoring. Participants also were asked to discuss their perceptions of agency approaches to mentorship. A few single or multiple choice with text answer questions were also included. The research team thoroughly read written texts of these semi-closed questions that had “Other”—an open text box to submit an answer not offered in the survey—in the response options. The “Other” response was changed to one of the pre-prepared response options if the response belonged to that specified option. (For copies of the survey instrument, contact the corresponding author.)

Because of a skip-logic malfunction in the Survey Monkey platform, some participants were not directed to the relevant sections based on their initial survey responses. As a result, the same set of questions was accessed by all the participants leading to the inadvertent repetition of some information and displacement of other information in the dataset. For repeated entries, the first responses were kept. To get comparable information for all questions, the displaced information was moved to where it should belong.

The study team took care to protect participant identities and to handle the data so as to ensure anonymity. This study adhered to ethical guidelines for the protection of humans in both data collection and analysis phases. Respondents were notified that participation in the survey was encouraged but not required and that they could skip any questions they preferred not to answer. There were no consequences for nonparticipation. Respondents also were made aware that no personally identifiable information would be collected. Each respondent was issued a computer-generated ID and no responses could be linked by the study team back to individuals. Subgroup analyses with sample sizes below 10 were neither conducted nor reported.

Data Analysis

At first, two limited-range continuous variables the General Schedule grade and career length were categorized to facilitate analysis and result interpretation, although such categorization leads to some loss of information. For federal government employees, there are 15 grades in the General Schedule (GS) based on responsibilities, educational

attainment, and experience. Participants were from GS-5 grade upward and there was no GS-10 in the fisheries job series. The GS grade was collapsed into three categories: GS-5 to 9, GS-11 to 12, and GS-13 to 15. These three categories roughly indicate the “entry-level,” “mid-level” and “top-level” positions, respectively. In the sample, the career length in the agency varied between 1 and 40 years, with a median of 15 years. Based on an informal classification scheme in the agency, the career length was divided into four categories: early career (7 years or fewer), “early-mid” career (8–15 years), “late-mid” career (16–25 years), and late-career (26 years or more).

A nonparametric equivalent of analysis of variance, the Kruskal–Wallis test, was used to determine whether the mean ranks differ across career stages and GS grades. Because non-parametric tests are often less powerful than parametric tests at detecting a smaller effect size, the significance level (alpha level) was set at $\alpha = .10$, which also reduces the risk of Type II error (i.e., failing to conclude an effect when there was one). Following the omnibus Kruskal–Wallis test, the Dunn test was used for multiple comparisons of mean ranks between the groups to determine which groups were different from each other. The Holm–Sidak stepwise adjustment to the alpha level was made to control the family-wise error rate.

When variables are categorical (observations organized into categories without any inherent ordering), a correlation coefficient cannot be used to detect the patterns in the data because the categories do not form a continuum. The chi-square test of independence was used to look for an association between two categorical variables that come from the same sample by observing whether certain combinations of the categories occur more frequently than expected by chance given the total number of times each category occurred. The chi-square statistic shows the discrepancy between the observed frequencies and the expected frequencies if there were no relationships at all in the population. If the statistical significance of the chi-square test indicates that the observed values are different from the expected values, then there is an association between the categorical variables. If the chi-square test was statistically significant then the strength of the relationship between two categorical variables was measured using Cramer’s V, which ranges from 0 to 1 theoretically, where 0 indicates no relationship and 1 is a perfect association.

Results

Participant Characteristics

Among the 251 participants who completed the survey, 52% were male and 88% were White (Table 1). The percentage of female aquatic professionals who responded (47%) was higher than the percentage of female employees in the USFS workforce (38%) in 2017; the percentage of White employees also was higher than the general USFS workforce (84%; Westphal et al., 2022). The majority of respondents (61%) were at the mid-level in grade (GS-11 to 12), with fewer in entry-level or senior positions. Respondents were evenly spread across career stages, with a slightly higher percentage of early career (28%). Gender showed no significant association with the GS level

Table 1. Participants' Demographic Information.

Variables	Levels/categories	Number	Percentage
Gender	Female	115	47.9
	Male	125	52.1
Race/ethnicity	White	205	87.6
	Black	2	0.9
	Hispanic	10	4.3
	Asian	3	1.3
	Native American	4	1.7
	Other	10	4.3
Career stages	Early career	69	27.9
	Early mid career	65	26.3
	Late mid career	58	23.5
	Late career	55	22.3
General Schedule (GS) grades	GS-5 to 9	44	18.0
	GS-11 to 12	150	61.2
	GS-13 to 15	51	20.8
Mentorship	Mentored	174	69.6
	Unmentored	76	30.4

and career stage ($p > .15$). Similarly, race/ethnicity had no significant association with the GS level and career stage ($p > .64$). A statistically significant association between the GS level and career stage was found ($\chi^2 = 33.4, p < .01, df = 6, V = .26$). More early-career participants (59%) belonged to GS-5 to 9 grades than others, and more late-career participants (34%) belonged to GS-13 to 15 grades than others. Almost seven in ten employees had one or more mentors during their career, and the proportions of employees having mentors did not vary across the GS level ($p > .21$), career stage ($p > .33$), gender ($p > .46$), and race/ethnicity ($p > .80$).

Overall Employee Well-Being

The survey presented five indicators related to work, sense of value, and job satisfaction to the participants to measure their overall well-being in the organizational context. The overall mean of all the indicators fell in the agreement region of a five-point ordinal scale, substantially far from the neutral response region (Table 2). There was a linear trend in the increment of job satisfaction among employees from lower to higher grades. Employees in higher grades were more likely to agree that their work is important than the employees in mid and lower grades. Similarly, the employees in higher grades were more likely to agree that their work is challenging than the employees in mid and lower grades. There were no statistically significant differences observed among employees at various grade levels for variables related to fulfilling work or

Table 2. Average Ratings With Standard Deviations (in Parenthesis) of the Variables Assessing Employee Wellbeing Across GS Levels and Career Stages.

Variables	Overall M (SD)	General Schedule (GS) levels					Career stages			
		GS-5 to 9	GS-11 to 12	GS-13 to 15	Early career	Early mid	Late mid	Late career		
How satisfied are you with your current position?*	3.77 (1.03)	3.54 (1.09)	3.73 (1.03)	4.08 (0.90)	3.84 (0.99)	3.62 (1.05)	3.64 (0.97)	3.98 (1.06)		
What I work on is important.*	4.32 (0.88)	4.18 (1.02)	4.29 (0.87)	4.54 (0.73)	4.36 (0.92)	4.29 (0.96)	4.32 (0.76)	4.34 (0.84)		
What I work on is challenging.*	4.25 (0.84)	4.07 (0.85)	4.21 (0.88)	4.54 (0.64)	4.20 (0.85)	4.28 (0.84)	4.26 (0.83)	4.31 (0.86)		
My work is fulfilling.	3.83 (1.02)	3.77 (1.10)	3.76 (1.04)	4.08 (0.85)	3.94 (1.05)	3.77 (1.00)	3.81 (0.96)	3.80 (1.05)		
I feel valued in my workplace.	3.48 (1.17)	3.34 (1.18)	3.42 (1.21)	3.78 (1.00)	3.69 (1.23)	3.32 (1.13)	3.45 (1.14)	3.45 (1.15)		

*and bold typeface indicate that the Kruskal–Wallis test assessing whether the medians are different across the groups was statistically significant at the alpha level $\leq .10$.

feeling valued. Along the career stages, employees' job satisfaction showed a U-shaped curve (or curvilinear relationship). The level of job satisfaction was higher among "early" and late-career employees than among mid-career employees. The other indicators showed no variation across career stages.

Needs for Mentorship

The survey presented a range of skills (ranging from leadership to conflict resolution to communication) to the participants and asked them to what extent they would consider it important to develop those skills through mentoring. The overall mean rating of the 13 reasons was higher than 3 (indicating the importance of skills in general) on the five-point Likert-type ordinal scale (Table 3). Based on the ranking of the overall mean scores, the top three skills employees seek to develop were technical skills (3.99), project management skills (3.94), and communication skills (3.93). If examined within the two categories separately, the mean rankings would vary across the grade levels and career stages and may not match the overall mean rankings.

Of the 13 skill types rated, three varied significantly across the grades, implying that a particular skill was more important to the employees in one grade level than in another. Employees in entry-level grades rated "career management or planning" skills to be more important than the employees in mid or higher grades. The average rating of "enhancing technical skills" decreased linearly from lower to higher grades, indicating that it is more important for the employees in lower grades. "Project management skills" also were ranked higher for employees at the GS-5 to 9 levels, compared with those in the top grades. There was no statistically significant variation for the 13 skills across the career stages, which meant that the average ratings across the four groups were similar.

The investigators qualitatively ranked the mean score ratings within the GS-level groups and career stages to report the top three skills for practical consideration. Looking exclusively at the top-3 skills mentioned for each GS-level group, "career management or planning," "enhancing technical skills," and "project management skills" were all important for entry and mid-level grades, while "building leadership skills" and "communication skills" rose to the top for GS-13 to 15 employees, along with "career management or planning." Focusing on the top-3 skills mentioned across the career stages, "enhancing technical skills," rose to the top for employees across all four stages, and "project management skills" appeared in the top-3 for all groups except late-career employees. Meanwhile, "communication skills" rose to the top-3 for "late mid" and late-career employees, and "building leadership skills" was noted by late-career employees.

The survey asked the participants what they perceive to be the benefits of mentorship considering 12 potential reasons (Table 4). Of the 12 reasons, one reason varied across the GS levels: more employees in the GS-13 to 15 grades were likely to report "greater awareness of my strengths and weaknesses" as a benefit of mentorship than the employees in the GS-5 to 9 grades. Along the career stages, more employees in the late-career stage reported "greater confidence" due to mentorship than the employees in the "early-mid" career stage, while no difference was detected between other

Table 3. Average Ratings With Standard Deviations (in Parenthesis) of the Variables Assessing the Skills Employees Seek to Develop Through Mentoring Across GS Levels and Career Stages.

Variables	Overall, M (SD)	General Schedule (GS) levels					Career stages			
		GS-5 to 9	GS-11 to 12	GS-13 to 15	Early career		Early mid	Late mid		Late career
Career management or planning*	3.85 (0.91)	4.36 (0.78)	3.72 (0.89)	3.87 (0.96)	3.92 (0.92)		3.89 (0.91)	3.95 (0.91)		3.62 (0.88)
Building self-confidence	3.53 (1.09)	3.74 (1.13)	3.54 (1.07)	3.34 (1.12)	3.67 (1.09)		3.31 (1.17)	3.50 (1.19)		3.68 (0.88)
Improving networking skills	3.70 (0.92)	3.82 (0.90)	3.67 (0.93)	3.71 (0.90)	3.68 (1.06)		3.79 (0.88)	3.77 (0.92)		3.59 (0.80)
Building leadership skills	3.83 (1.01)	3.96 (0.94)	3.80 (1.05)	3.82 (0.95)	3.76 (1.13)		3.83 (0.93)	3.95 (1.00)		3.81 (0.98)
Enhancing technical skills*	3.99 (1.01)	4.41 (0.82)	4.08 (0.93)	3.39 (1.17)	4.00 (1.09)		3.98 (1.00)	4.02 (1.11)		3.98 (0.88)
Enhancing informal skills	3.55 (1.00)	3.68 (1.16)	3.60 (0.95)	3.29 (1.04)	3.63 (1.03)		3.24 (1.01)	3.62 (1.10)		3.72 (0.78)
Balancing work and personal life	3.54 (1.19)	3.78 (0.97)	3.56 (1.23)	3.32 (1.18)	3.67 (1.04)		3.44 (1.34)	3.44 (1.14)		3.64 (1.25)
Motivating employees	3.53 (1.11)	3.67 (0.96)	3.54 (1.14)	3.40 (1.14)	3.83 (1.03)		3.41 (1.17)	3.42 (1.16)		3.48 (1.09)
Development of my professional values/ethics	3.63 (1.09)	3.79 (0.88)	3.63 (1.14)	3.51 (1.07)	3.70 (1.15)		3.38 (1.15)	3.81 (1.03)		3.66 (0.99)
Conflict resolution skills	3.71 (1.02)	3.89 (0.97)	3.72 (0.99)	3.58 (1.13)	3.94 (0.92)		3.61 (1.11)	3.65 (1.13)		3.66 (0.91)
Communication skills	3.93 (0.97)	4.14 (0.80)	3.94 (0.97)	3.77 (1.09)	3.92 (0.94)		3.81 (1.19)	4.18 (0.87)		3.85 (0.82)
Effective time management	3.59 (1.06)	3.82 (0.90)	3.60 (1.05)	3.37 (1.16)	3.73 (0.97)		3.58 (1.20)	3.72 (1.08)		3.31 (0.96)
Project management skills*	3.94 (1.02)	4.17 (0.80)	4.03 (1.00)	3.50 (1.11)	3.98 (1.03)		3.98 (1.03)	4.07 (1.04)		3.72 (0.96)

*and bold typeface indicate that the Kruskal–Wallis test assessing whether the medians are different across the groups was statistically significant at the alpha level $\leq .10$.

Table 4. The Mean Ranks of Perceived Benefits of Mentorship in Each Group Across GS Levels and Career Stages, an Indication of Whether One GS Group or Career Stage Dominates Over Others.

Variables	General Schedule (GS) levels			Career stages			
	GS-5 to 9	GS-11 to 12	GS-13 to 15	Early career	Early mid	Late mid	Late career
Greater confidence*	70	75	80	72	61	82	89
Better understanding of the agency	64	71	76	69	68	68	82
Enhanced communication skills	80	75	72	79	66	81	78
Improved technical skills	73	78	65	72	77	80	74
Improved work attitude	70	72	76	74	63	82	77
Greater job satisfaction	74	73	79	74	63	82	82
Improved work habits or organizational skills*	66	73	70	71	61	83	74
Better project management skills	67	75	70	67	69	79	79
Improved conflict management or resolution skills	71	72	75	76	67	79	72
Improved problem- solving skills*	69	75	71	73	66	89	69
Greater awareness of my strengths and weaknesses*	61	75	83	73	68	83	76
Better understanding of my core values	71	75	73	78	67	84	72

*and bold typeface indicate that the Kruskal–Wallis test assessing whether the medians are different across the groups was statistically significant at the alpha level $\leq .10$.

groups. More employees in the “late-mid” career stage reported “improved work habits or organizational skills” due to mentorship than the employees in the “early-mid” career stage. Similarly, more employees in the “late-mid” career stage reported “improved problem-solving skills” due to mentorship than the employees in the “early-mid” career stage.

The participants were presented with 12 reasons to rate their perception of successful mentorship (Table 5). The average ratings of three reasons varied across GS levels or career stages, but the other reasons had similar ratings. More employees in the

Table 5. The Mean Ranks of Successful Mentor Outcomes in Each Group Across GS Levels and Career Stages, an Indication of Whether One GS Group or Career Stage Dominates Over Others.

Variables	General Schedule (GS) levels			Career stages			
	GS-5 to 9	GS-11 to 12	GS-13 to 15	Early career	Early mid	Late mid	Late career
Impact on my wanting to get a permanent job with the agency	63	52	46	53	54	62	45
Faster promotion to next grade*	84	64	64	73	66	74	60
Support me in getting jobs or professional recognition	77	70	78	71	70	82	74
Improved technical ability	79	77	63	69	74	83	75
Better awareness of how agency operates	74	71	75	77	69	71	76
Greater satisfaction with my current job	74	70	72	70	70	80	68
Feeling more competent in my current job	79	71	74	76	68	81	71
Sense of empowerment or enhanced confidence	75	72	80	73	68	77	84
Expanded professional network*	72	74	79	68	85	85	66
Awards or recognition from my supervisor	80	67	69	70	70	73	69
Increased readiness to shift into a new position*	84	66	66	73	72	75	60
Greater awareness of personal strengths, weaknesses and work styles	67	79	69	71	75	85	73

*and bold typeface indicate that the Kruskal–Wallis test assessing whether the medians are different across the groups was statistically significant at the alpha level $\leq .10$.

entry-level grades considered “faster promotion to next grade” as an indication of successful mentorship than the employees in other grade categories. Similarly, more employees in the entry-level grades perceived “increased readiness to shift into a new position” as an indication of successful mentorship than the employees in other grade categories. Along the career stages, more employees in the two mid-career stages considered “expanded professional network” as an indication of successful mentorship than the employees in the early or late-career stages.

The investigators qualitatively examine the top-3 successful outcomes of mentoring within the grade categories and career stages (Figure 1). For the entry-level employees, outcomes noted were “faster promotion to next grade,” ‘increased readiness to shift into a new position,’ and “awards or recognition from my supervisor.” For middle-grade levels, outcomes that rose to the top were: “greater awareness of strengths, weaknesses and work styles,” “improved technical ability,” and “expanded professional network.” Employees at higher GS-levels, also mentioned “expanded professional network,” along with a “sense of empowerment or enhanced confidence” and professional recognition. When comparing “top-3” responses within career levels, early career employees mentioned “better awareness of how the agency operates” and “feeling more competent in my current job.” ‘Early-mid’ and “late-mid” career employees were identical in their outcomes (expanded professional network, awareness of strengths, weaknesses, and improved technical ability). Late-career employees emphasized “sense of empowerment or enhanced confidence,” ‘better awareness of how the agency operates,’ and “improved technical ability.”

Importance of Mentors

The survey asked the participants why mentors are important for employee development and how their support would be helpful to mentees. Of the five items intended to assess the importance of mentorship, two varied across the GS levels or career stages (Table 6). A higher proportion of employees in the entry-level (GS-5 to 9) grades thought “mentoring would be valuable to my professional growth” compared with employees in the other grade categories. Likewise, a greater proportion of employees in the entry-level grades said that “our agency could use more mentors to serve employees” than the employees in mid-level or higher grades. No difference was detected in the ratings of other items and between other groups. Across the career stages, more “early” career and “early-mid” career employees believed “mentoring would be valuable to my professional growth” than the late-career stage employees.

Access to Mentors

The survey asked the participants about opportunities, encouragement, support, and exchange for mentorship within the agency to assess their perception regarding access to mentorship through six items. The average ratings of five positively framed items fell in the disagreement region while that of one negatively framed item fell in the agreement region of the five-point ordinal measurement scale (Table 7). The average



Figure 1. “Top-3” Mentioned Mentoring Outcomes Across GS-Levels and Career Stages.
Note. “Early-Mid” and “Late-Mid” top-3 items were identical and were combined for this figure. GS = General Schedule.

Table 6. Average Ratings With Standard Deviations (in Parenthesis) of the Variables Assessing the Importance of Mentors Across GS Levels and Career Stages.

Variables	Overall M (SD)	General Schedule (GS) levels					Career stages		
		GS-5 to 9	GS-11 to 12	GS-13 to 15	Early career	Early-mid	Late mid	Late career	
Mentoring would be valuable to my professional growth.*	4.00 (0.87)	4.36 (0.87)	3.98 (0.89)	3.77 (0.74)	4.23 (0.74)	4.13 (0.91)	3.96 (0.85)	3.69 (0.92)	
More agency employees would benefit from having a mentor.	4.28 (0.68)	4.22 (0.83)	4.29 (0.66)	4.29 (0.59)	4.25 (0.65)	4.30 (0.82)	4.34 (0.59)	4.26 (0.64)	
Having a mentor can improve job satisfaction.	4.14 (0.75)	4.19 (0.89)	4.13 (0.76)	4.11 (0.62)	4.23 (0.70)	4.11 (0.84)	4.15 (0.72)	4.04 (0.76)	
Our agency could use more mentors to serve employees.*	4.11 (0.79)	4.33 (0.79)	4.07 (0.80)	4.04 (0.75)	4.10 (0.82)	4.13 (0.90)	4.23 (0.67)	4.02 (0.76)	
Employee morale would benefit from a successful mentoring program.	4.14 (0.81)	4.25 (0.97)	4.13 (0.79)	4.09 (0.74)	4.27 (0.74)	4.09 (0.99)	4.23 (0.67)	4.00 (0.79)	

*and bold typeface indicate that the Kruskal–Wallis test assessing whether the medians are different across the groups was statistically significant at the alpha level $\leq .10$.

Table 7. Average Ratings With Standard Deviations (in Parenthesis) of the Variables Evaluating Access to Mentors Across GS Levels and Career Stages.

Variables	Overall M (SD)	General Schedule (GS) levels					Career stages		
		GS-5 to 9	GS-11 to 12	GS-13 to 15	Early career	Early-mid	Late mid	Late career	
I have access to mentorship opportunities within my agency.*	2.96 (1.05)	2.69 (0.95)	2.90 (1.06)	3.34 (0.99)	2.88 (1.04)	2.94 (0.96)	2.81 (1.04)	3.14 (1.17)	
My current supervisor has encouraged me to work with a mentor.*	2.37 (1.05)	2.55 (1.11)	2.29 (1.01)	2.45 (1.11)	2.65 (1.23)	2.46 (1.00)	2.15 (0.86)	2.18 (1.01)	
My agency values mentor relations for employee development.*	2.73 (1.02)	2.67 (1.01)	2.63 (1.01)	3.07 (1.00)	2.85 (1.07)	2.63 (0.90)	2.62 (1.09)	2.79 (1.02)	
My agency effectively communicates mentorship opportunities for employees.*	2.12 (0.94)	2.00 (1.01)	2.05 (0.92)	2.41 (0.90)	2.33 (1.32)	2.06 (0.86)	1.89 (0.85)	2.18 (0.86)	
Very few people I work with have mentors.*	3.70 (1.06)	3.92 (1.05)	3.79 (1.01)	3.27 (1.11)	3.78 (0.90)	3.80 (1.12)	3.68 (1.23)	3.44 (1.01)	
The USDA Forest Service encourages employees to seek out mentors.*	2.46 (0.92)	2.31 (0.92)	2.41 (0.91)	2.73 (0.92)	2.56 (1.02)	2.33 (0.87)	2.40 (0.91)	2.57 (0.89)	

*and bold typeface indicate that the Kruskal–Wallis test assessing whether the medians are different across the groups was statistically significant at the alpha level $\leq .10$.

ratings below the neutral point (3) suggest that access to mentorship was challenging to the participants across grade levels. More employees in the entry-level (GS-5 to 9) and mid-level (GS-11 to 12) grades disagreed that they have access to mentorship within their agency than in the top level (GS-13 to 15).

Across the GS levels, employees felt that their supervisor has not encouraged them to work with a mentor. For the question item "my agency values mentor relations for employee development," the average rating of employees in the entry and mid-levels was significantly lower than that of the top level. More employees in the entry-level and mid-level disagreed with the statement that "my agency effectively communicates mentorship opportunities for employees" than in the top level. More employees in lower grades disagreed with the statement that "the USDA Forest Service encourages employees to seek out mentors" than the employees in higher grades. For the statement "very few people I work with have mentors," the average ranking of employees in the entry-level and mid-level grades was substantially lower than that of the employees in the top level. (No difference in the average ratings was detected between employees in the entry-level and mid-level.) Of the six items regarding access to mentorship, the average ratings of only one item varied across the career stages. For the statement, "my current supervisor has encouraged me to work with a mentor," employees in the "late mid" career stage and late-career stage rated this substantially lower than the employees in the "early" career stage.

Structural Needs

The desire for a formal mentoring program varied across GS grades and career stages. When asked about their administrative unit, more employees in the entry-level grades (69%) believed it to be important to have a formal mentoring program than the employees (55%) in the mid-level grades and the employees (45%) in the top-level grades ($\chi^2 = 7.7$, $p = .10$, $df = 4$, $V = 0.14$). Similarly, more employees in the early-career (66%) and "early-mid" career (65%) stages believed it to be more important to have a formal mentoring program than the employees in the "late-mid" career (49%) and late-career (41%) stages ($\chi^2 = 11.5$, $p = .07$, $df = 6$, $V = 0.17$). When asked about the implementation of a formal mentoring program across the entire USDA Forest Service, the average ratings on a 5-point scale were 3.83 for entry-level grades, 3.52 for mid-level grades, and 3.59 for top-level grades. Similarly, the average ratings on a 5-point scale were 3.81 for "early" career, 3.50 for "early-mid" career, 3.70 for "late-mid" career, and 3.39 for late-career stage employees. Although entry-level grades and "early" career employees had slightly higher ratings, these were not shown to be statistically significant. The responses to the statement "I believe that mentoring should be informal or situational" did not vary across GS grades or career stages. The average ratings on a five-point scale were 3.36 for entry-level grades, 3.67 for mid-level grades, and 3.58 for higher grades. Likewise, the average ratings on a five-point scale were 3.60 for the "early" career stage, 3.43 for the "early-mid" career stage, 3.51 for the "late-mid" career stage, and 3.82 for the late-career stage employees.

Discussion

Study results provide empirical support for the importance of mentoring across career stages and job ranks and for recognizing that the structure and outcomes of mentoring may vary over the career span. Mentoring has been associated with instrumental outcomes such as job mobility (Scandura, 1992) and career progress (Chao & Walz, 1992) as well as improved job satisfaction and expanded organizational commitment (Chao et al., 1994). Mentoring programs in government agencies have been touted for their potential to develop leaders, curb employee turnover, increase productivity, improve morale, and promote diversity (Allen et al., 2008; Bozeman & Feeney, 2007). Mentoring outcomes can be predicted by the mentee and mentor attributes, the nature of the mentoring relationship, and the extent to which the relationship focuses on building social capital (Bozeman & Feeney, 2009). Considering that social capital needs vary across an employee's career stages and grades, it is assumed that the nature of the mentoring relationship would likely vary. Moreover, mentorship across the career stages may look different because of variations in employee performance, professional goals, and desire for collaborative learning. Peer learning, skill development, and continual training (all components of mentoring) can be especially helpful in career transitions, relationship changes, and role shifts (Arthur & Rousseau, 1996; Sullivan, 1999). Each transition suggests different mentoring needs at different phases of the career (Baugh & Scandura, 1999).

This study found variations in employee relationships with their work across grade levels and career stages. Employees in higher grades reported their work to be important, challenging, and satisfactory more frequently than the employees in lower grades. Early and late-career employees were more satisfied with their current position than mid-career employees. This study also showed that changes in employee satisfaction increase linearly with grade level and are represented in a U-shape with the career stage. This suggests that one's level in the organization (which is accompanied by higher salary and responsibility) is more important than career length for determining satisfaction. Employee job satisfaction is critical for the success of any organization (Belias & Koustelios, 2014). In this study, the lowest level of job satisfaction was observed among the mid-career employees, who presumably have gathered some experience and skills, but who may benefit from some type of intervention to fully unleash the accumulated talent. Mentoring can improve job satisfaction through career development and psychosocial support as well as the establishment of developmental networks (Kram, 1983).

The finding of a linear increment of job satisfaction ratings along the grade levels and a nonlinear U-shape curve across the career stages needs further explanation. Although grade levels and career stages have shown a statistically significant association, there is not complete overlap (or very strong relationship) between them as shown by a small Cramer's V value (0.26). It is true that most early-career employees also start at lower grades. As their tenure in the agency increases, some employees may move to higher grades or other organizations, while others remain at the same grade. In 2022, there were 1,211 (4%) positions agency-wide above GS-13 level (USDA Forest Service, 2023b). Late-career employees who remain in the mid-level grades either might express

dissatisfaction about their advancement opportunities or they may be content with their standing. Managers may consider evaluating employees who have worked in entry- or mid-level grades for prolonged periods to determine whether mentoring may help them to break through the career plateau (Wang et al., 2014).

It is reported elsewhere that employees are less likely to desire a mentoring relationship in late-career stage (Blood et al., 2012; Freedman, 2009). This present study finds no difference in mentorship participation across the four career stages. This result might have been different from previous studies due to the greater availability of mentors across all stages or because a strong emphasis on continued mentoring already existed within the aquatic sciences disciplines. The availability of mentors is a strong indicator of whether employees engage in mentorship, and the practice of supervisors serving as mentors in the agency might have facilitated it.

The present results are in line with the previous findings that mentoring needs, aspirations, motivations, and involvement change over career stages (Allen et al., 2004). This study identified that the skills sought for development through a mentor appears to vary based on GS-level and career-stage. Overall, technical skills were most highly valued, and this was consistent across grade-levels and career stages. Three types of skills (technical, career management, and project management) were even more valued by employees in entry-level grades than in all other grades. The qualitative assessment of the “top-3” skills sought by mentees showed that these three skills remain important in the middle grades. Meanwhile, leadership skills and communication skills rose to the top both for higher grade positions and for late-career employees. It is noteworthy that of the 13 skills listed, 4 were above the mean for late-career employees, which could suggest that late-career employees are less interested in skill development through mentoring or that the skills they seek to bolster were not listed. More research is needed to explore late-career mentoring needs.

The assessment of mentoring benefits showed little variation across grade levels. More employees in top grades regarded “greater awareness of their strengths and weaknesses” as a benefit of mentoring than the employees in other grades. While there was less variation in perceived benefits of mentoring across the grade levels, lower-grade employees perceived tangible outcomes from mentoring, such as faster promotion to the next grade, an increased readiness to shift into a new position, and recognition from their supervisor. This is consistent with findings by Lee (2020) who found that junior employees are more concerned about advancement than their senior counterparts. It also is consistent with the early notions of career phases proposed by Super et al. (1980). However, when the outcomes were examined across career stages, there is no evidence of these practical outcomes being higher for early-career employees. Late mid-career employees were more likely to report greater confidence, improved work habits, and problem-solving skills as benefits of mentoring compared to others, while late-career employees benefited from confidence-building and leadership skills. In the mid-career stages, an expanded professional network becomes an important outcome, but this wanes later in the career, presumably because the network is established. For agencies seeking to incentivize mentoring, these differences in perceived outcomes across grade levels and career stages are meaningful.

Both employees early in their careers and at lower grades were more likely to indicate that they found mentoring valuable for their professional growth, and employees in lower grades were more likely to say that their agency could use more mentors. Access to mentors appears to be a challenge—particularly at the lower grade levels. This could be due to the absence of higher-grade employees at the district and forest levels to serve as mentors. In 2022, 12% of USFS employees working outside Washington, DC, were above the GS-13 level (USDA Forest Service, 2023b). It appears that entry-level employees who would benefit most from mentoring do not perceive that the agency is really encouraging mentorship. This is surprising, given that higher grade and later-career employees universally recognize the value of mentorship, and many had been previously mentored. Lower-grade employees were more apt to disagree that the agency values mentorship, effectively communicates mentorship, or encourages employees to seek out mentors. The irony is that entry-level employees need mentors to expand organizational awareness (Chao et al., 1994). Meanwhile, employees in the middle and later career stages received the least encouragement from their supervisor to work with a mentor, which raises questions about whether it is assumed that they either would not benefit from a mentor or do not need support in finding one. This study's results also showed that lower-grade employees and early-career employees both had a stronger preference for formal mentoring in their immediate unit. This type of mentoring could help to expand options for identifying a mentor beyond the immediate supervisor, particularly for employees who do not have an established network.

There are few limitations that need to be considered while interpreting the results of this study. First, the study targets only one group of professionals—fish biologists and aquatic ecologists—within one federal land management agency (USFS), which has various types of professionals in the workforce who are not represented in this research. The higher proportion of employees having a mentor and the unvarying status across career stages could be due to the selection bias toward the specific profession. Notably, this profession has fewer employees at the lower GS level; most aquatic professionals enter the field at GS-9 or higher. Thus, the results can be generalized for a particular group of professionals. Second, the sample size is large enough for statistical analyses, but they were not randomly selected samples. Although an attempt is made to contact all the employees within this one profession, the lack of an accurate sampling frame makes it harder to understand the actual proportion of employees that responded to the survey. Third, the research design is exploratory and observational, so establishing any causal claim is not possible. Future studies can expand the scope of the investigation to other professions and agencies.

Study Implications

Mentoring can be a tool used by public organizations to activate management principles, such as unity, equity, stability of tenure, and *esprit de corps* (Fayol, 1978), and can help to align individual worker needs with organizational goals (Barnard, 1938). This study provides several important insights for the USFS as well as other public

agencies that are implementing formal or informal mentoring programs. In 2021 (after the survey was conducted), the USFS introduced a National Mentoring Program for employees, which was formal and traditional in nature, matching senior agency employees with early career mentees (USDA Forest Service, 2023a). The results suggest that this type of program will support the needs of employees in early career stages and entry-level grades, who show a stronger interest in formal mentoring and who may lack a professional network from which to draw prospective mentors. Public management agencies seeking to develop mentoring programs might recognize that the desired skills and outcomes of mentees vary at different career stages and as employees move up in the organization. Mid-level and mid-career mentees seek to benefit from expanded professional networks and greater self and agency awareness through mentorship. Higher-grade and late-career employees note an interest in building communication and leadership skills through mentors and were less inclined to favor formal mentoring. Agency promotion of both formal and informal mentoring strategies may extend the benefits of mentoring to a wider range of employees. Moreover, other mentoring models (e.g., peer mentoring, group mentoring, or reverse mentoring), may be appropriate for achieving certain learning goals (Mullen & Klimaitis, 2021).

Across all employee types, interest in mentoring was high, while awareness of agency mentoring opportunities was low. While early-career employees may have received some mentoring during onboarding and orientation phases, opportunities appear to wane for employees in the middle stages, who also are more likely to have untapped mentoring needs. Mentoring is one approach for strengthening organizational citizenship (McManus & Russell, 1997) and this can be important in the middle career years, as employees become more established. Public management agencies that fail to meet the mentoring needs in the mid and late-career stages may risk losing or misdirecting the experienced talent. Agency investments in leadership programs for middle and senior leaders typically offer structured mentoring and coaching, yet this leaves out high-value employees who are not geared for leadership roles, but who may benefit from mentorship for expanded career opportunities or professional support. Given that many mid and late-career employees had been mentored and had acknowledged the benefits of mentoring, it is surprising that access to mentors remains a challenge for entry-level employees. Agency training for new and existing supervisors may benefit from modules focused on mentoring skills and strategies for matching supervisees with mentors. By enhancing mentoring opportunities throughout the duration of an employee's career, agencies can provide mentees with different perspectives, knowledge, and skills that may further lead to long-term career success, retention, and overall satisfaction.

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