

Best Practices in Research Mentoring in Clinical Science

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The growth of clinical science as a field depends on the work of engaged mentors nurturing future generations of scientists. Effective research mentoring has been shown to predict positive outcomes, including greater scholarly productivity, reduced attrition, and increased satisfaction with training and/or employment, which ultimately may enhance the quality of the clinical-science research enterprise. Barriers to effective research mentoring, however, pose significant challenges for both mentees and mentors, as well as for labs, training programs, and/or departments. We discuss some key issues as they apply to clinical-science mentoring and note how they are affected across different developmental levels (undergraduate, postbaccalaureate, doctoral, internship, postdoctoral associates, and early career faculty). Although we do not proclaim expertise on these issues—and have struggled with them in our own careers—we believe an open discussion around best mentoring practices will enhance our collective effectiveness and help mentees and our field to flourish.

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General Scientific Summary

Effective mentoring is important to fostering important outcomes in clinical science. We discuss key mentoring issues for undergraduate and postbaccalaureate students, graduate students, clinical science internship and postdoctoral fellows, as well as early career faculty. We conclude by outlining a path forward for further discussion and research around best mentoring practices in clinical science.

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In clinical science, as in many academic disciplines, mentorship is a powerful responsibility that can challenge both mentor and mentee. The very concept of the mentor has daunting literary origins. In Homer's *Odyssey*, Odysseus's son, Telemachus, is left behind as his father journeys to Troy. Telemachus is addled and inept until the goddess Athena intervenes. Athena assumes the body and voice of Mentor, an old friend of Odysseus, and guides and provides Telemachus with a transformative degree of psychological fortitude (Lattimore, 1965; O'Donnell, 2017). The standard set by Homer's Mentor—having godlike wisdom, instantiating the mentee's epic transformation—is formidable. Yet, today, few are formally taught mentorship skills, and many mentors feel uncertain, apprehensive, and in need of guidance as they negotiate these complex professional relationships, especially in a field that must balance research and clinical-training goals.

This article's goal is to generate discussion about important mentoring issues in clinical science and encourage future work tackling emerging mentoring challenges. We first discuss what we know and do not yet know about effective mentorship across various stages of clinical-science training, from undergraduates to early career scientists. Next we offer a discussion of best practices in mentoring based on the premise that effective mentorship promotes not only individual success, but also our field's collective success. We focus on *research mentoring*, that is, how best to train future scientists conducting and disseminating research about psychopathology, its assessment and treatment, recognizing that these skills may be unique to other advisory or supervision experiences. This article is applicable for readers with varying degrees of familiarity with the issues discussed. Although it primarily addresses mentoring in the context of psychology departments, the issues raised are likely relevant to psychiatric, medical, and neuroscience fields. We aim to move beyond the status quo to consider more deeply what will best prepare mentees for the future of clinical science.

What Do We Know About Clinical-Science Research Mentoring?

There are at least seven reasonably well-established research findings on mentoring; however, to our knowledge, few (if any) are specific to clinical science.

1. Mentoring involves providing mentees with multiple types of support, including advising, sponsoring, promoting visibility and exposure, coaching, giving challenging assignments, role modeling, protecting, accepting and confirming, counseling, and befriending. These fall into

career and psychosocial support mentoring functions (Kram, 1985).

2. Mentees value certain behaviors in mentors, including role modeling, effective communication, and honest and constructive feedback (Rose, 2003). Rose reported three dimensions of individual differences in a priori ratings of the "ideal" mentor: Integrity (e.g., value/believe in me, give me proper credit, thoughtful/considerate), guidance (e.g., provide information, set deadlines, problem solve), and relationship (e.g., share experiences, positive attitude, have informal interactions).
3. There are important differences between formal and informal mentoring. The classic 1:1 mentoring model is informal and associated with a greater range of mentoring functions and higher satisfaction (Jackson et al., 2003; Noe, 1988; Ragins & Cotton, 1999). However, there is an uneven availability of informal mentoring, especially for women and members of underrepresented minorities (Boyle & Boice, 1998). Even when formal mentoring programs exist, many individuals seek out informal mentoring with individuals they perceive as more similar to themselves and with whom they interact more productively (Holt, Markova, Dhaenens, Marler, & Heilmann, 2016).
4. Effective mentoring provides benefits for both mentees and mentors. Meta-analyses (e.g., Allen, Eby, Potet, Lentz, & Lima, 2004; Girves, Zepeda, & Gwathmey, 2005) indicate that *effective mentoring*—defined as mentoring in which both the mentee and mentor achieve their career-related and professional development goals (Allen et al., 2004)—is associated with positive objective (e.g., greater compensation and career advancement) and subjective (e.g., higher job and career satisfaction, career commitment, and expectations for advancement) outcomes.
5. Both mentees and mentors benefit from multiple-mentor models. A constellation of supportive relationships to support mentees in different domains and across their evolution as scientists has clear benefits (Dobrow, Chandler, Murphy, & Kram, 2012; Terry & Ghosh, 2015). Multiple mentors offer diverse perspectives with different knowledge and skills, are better mentors that can help buffer the effects of a dysfunctional mentoring relation-

ship, assuage the “time burden” of individual mentors and provide support across different domains (e.g., personal issues may be best kept out of more professional relationships (de Janasz & Sullivan, 2004). The “Mentor Map” of the National Center for Faculty Development and Diversity illustrates the various functions multiple mentors can provide (see Part A of the online supplemental material).

In addition to multiple mentors at the same professional level (e.g., multiple faculty mentors), vertical team mentoring across levels may be valuable: Senior faculty can mentor junior faculty, who can in turn mentor postdoctoral fellows, who can mentor graduate students, who can mentor undergraduates. Peer mentors also offer a helpful supplement to mentoring between individuals at different career or training stages (e.g., Cornelius, Wood, & Lai, 2016). A multiple mentoring approach can both increase the diversity of perspectives available and even help them acquire mentoring experience.

6. Some mentee behaviors increase the effectiveness of mentoring. Mentee behaviors such as arriving on time, being prepared for meetings, and taking responsibility for one’s own actions can elicit more effective mentoring, perhaps through the mechanism of mentors’ perceptions: Mentees perceived by their mentors as foresightful, proactive, probing, respectful, grateful, reciprocal, and humble get better mentoring (Burroughs Wellcome Fund, Howard Hughes Medical Institute, 2006).
7. Everyone can benefit from mentoring. Gender and race are weaker determinants of mentoring benefits than previously thought. Recent research suggests that men and women are mentored at about the same rate and receive similar mentoring functions and benefits (DeCastro, Griffith, Ubel, Stewart, & Jagsi, 2014; Harden, Clark, Johnson, & Larson, 2009; Leavey, 2017). Furthermore, racial homogeneity is not a strong predictor of mentor-relationship attributes or outcomes (DeCastro et al., 2014; Eby et al., 2013; Harden et al., 2009; Harrison, Price, & Bell, 1998; Hernandez, Estrada, Woodcock, & Schultz, 2017), although same-race mentors may be preferred (Brooms & Davis, 2017).

What Don’t We Know About Clinical Science Mentoring?

Despite the consensus that mentorship is valuable, extant research, practice, and policy on mentorship is limited by a lack of conceptual clarity and consistency in defining benchmarks or mutually agreed-upon outcomes to differentiate “successful” from “unsuccessful” mentoring behaviors (Baker, Pifer, & Griffin, 2014; Berk, Berg, Mortimer, Walton-Moss, & Yeo, 2005). There also is substantial variability in the paths to high-quality mentorship (i.e., equifinality) and mentorship styles are highly individualized and may evolve through trial-and-error. Moreover, there are mentee differences in desires and expectations for mentors (Rose, 2005).

In the following text, we discuss the central mentoring issues relevant to each of four career stages to offer a framework that can

be used to guide future research, based on the premise that clinical science mentoring includes a developmental consideration of personal and professional development, emotional support, and skill building (see Table 1). Moreover, mentoring is by definition a transactional process, with mentors continually guiding, yet informed by their trainees’ progress, input, and feedback. In short, we believe that great mentors are not those who necessarily possess requisite competence, but are continually learning through a process of reflection, adjustment, growth, and ongoing communication with each mentee.

Undergraduate and Postbaccalaureate Research Mentoring

The role of mentors to undergraduates is unique because, in many cases, these mentors serve as a gateway into our profession. Undergraduates’ mentors should be prepared to discuss the current state of psychological science, process, and prospects of graduate school admissions, and the multitude of professions that allow one to use clinical-science training, including various careers in academia as well as administrative, corporate, health care, and educational settings. Several resources are available to help new mentors effectively discuss these points or offer to undergraduates for their own reading (e.g., Prinstein, Choukas-Bradley, & Guan, 2013; Sayette & Norcross, 2018). As the national acceptance rate into doctoral clinical psychology programs is ~8%, with many clinical science programs <5% (Prinstein et al., 2013), it is critical to help undergraduates develop a realistic appraisal of their admission chances and help them assess their genuine interest in a scientific approach to the study and practice of clinical psychology.

A second role of undergraduates’ mentors is a “surrogate parent,” including normalizing undergraduates’ identity confusion; discussing balancing professional and personal responsibilities; teaching appropriate workplace skills (often the first formal context for students to learn and practice research skills); and helping undergraduates assess their strengths, weaknesses, workstyles, and interests as they contemplate their coursework, extracurricular activities, and career options.

A third task for undergraduates’ mentors is to help them extract meaningful lessons and skills from their research experiences. For example, a mentor may help undergraduates understand why a research project is being conducted, how a project can make an important contribution, and eventually the way it may be used to inform the assessment, prevention, or amelioration of psychological symptoms. Undergraduates’ mentors should help mentees understand how to evaluate published research critically, generate novel hypotheses, design innovative studies, and frame their research for a broad array of audiences. Many undergraduates will rely on a mentor to guide their search for a postbaccalaureate position or through the process of graduate-school admission (e.g., Calhoun & Prinstein, 2012; Prinstein et al., 2013).

Students are changing and so must mentoring styles. Remarkably little work has discussed *multiple mentoring*, which is a common experience for undergraduates who interact with classroom instructors and often multiple professors and graduate students overseeing or serving as formal or informal mentors.

Table 1
Overview of Mentoring Task Milestones Across Four Levels of Mentoring

Mentoring milestone	Primary mentoring tasks			
	Undergraduates	Graduate students	Interns/postdocs	Early faculty
Personal development	Fostering autonomy/personal and career goals are differentiated from family of origin. Encouragement of long-term planning/ understanding implications of decisions decades later	Fostering financial and curricular independence/ selecting specific training experiences. Managing self-derived expectations for perfection, and learning time management skills	Guidance on how to determine career and personal values. Wrestling with imposter syndrome/ transition from trainee to faculty	Help early faculty recognize that most skills required to function successfully as a faculty member are not explicitly taught. Encourage mentees to have learning goals, not performance goals
Professional development	Teaching about the field of psychology and about clinical science; Develop confidence in reviewing existing scientific literature and developing novel hypotheses. Learning the tone and style of manuscript writing	Achieving depth of knowledge about a specific research area(s). Promote development towards nearly autonomous manuscript preparation. Develop initial grant writing skills. Develop a professional network of colleagues interested in related topics	Promote autonomy in one or more areas of research/clinical competence. Facilitate development of grant writing skills including the mechanics and the way to “frame” one’s research. Teach supervision skills. Help ensure access to datasets and/or collaborators that will allow a fruitful transition through the first few years of faculty	Encourage experimentation with different approaches to allow rapid development of faculty skills. Help faculty select career opportunities that are most rewarding and have best vita-value for one’s ultimate professional goals
Emotional support	Mentees may need help with apprehension about a confusing application process, potentially conflicting pressure from parents vs. teachers, and the uncertain future of life as a graduate student	Mentees may question their interest in the field, doubt their ability to become as prolific as their faculty mentors, and feel torn between personal and professional goals/expectations during this life stage	Mentees may need encouragement to act justifiably confident and autonomously while they still feel inexperienced. May need help with long-term vision and meaningful priorities when selecting a career path or job prospect	May need help feeling imperfect for the first few years and may need help focusing on what is within their control and what is not while awaiting tenure/promotion decisions
Skill building	Emphases on critically reviewing manuscripts, foundations in psychological theories, comfort with statistics	Competence in hypothesis generation, writing, statistics, critically reviewing others’ work	Emphasis on writing more quickly, serving as a reviewer, and asserting oneself as an expert in a specific content area	Learning how to cultivate the next generation of clinical scientists

Yet it remains unknown who may best benefit from multiple mentors and how these mentors can augment, rather than undermine one another’s guidance, or what mentor characteristics (e.g., faculty rank; similar vs. contrasting mentoring ideology) are most closely associated with successful team mentoring. Today’s cohorts of students are also far more diverse than in past generations, not only with respect to gender and ethnic/racial backgrounds, but also sexual and gender-minority identity, socioeconomic status, ability, and so forth mentoring with sensitivity to diversity and multicultural humility and is especially important to consider. The institutional context is a powerful influence on undergraduate students’ research and other life experiences during college, setting local norms for inclusivity (or lack thereof), and potentially providing funding and other opportunities for students’ research involvement (e.g., National Science Foundation-funded research experiences for undergraduates). Mentors must be keenly aware of power dynamics they exert (even if unknowingly) over young trainees and be aware of, and know how to report, violations of professional boundaries among undergraduates and/or between faculty and students.

Graduate Student Research Mentoring

The empirical literature on faculty mentoring of graduate students in psychology is limited, with even fewer studies focusing on clinical psychology or research mentoring (Callahan & Watkins, 2018; Lundgren & Orsillo, 2012). Nonetheless, consistent with the larger literature, mentoring in psychology graduate programs are associated with greater student achievement and satisfaction (Clark, Harden, & Johnson, 2000; Johnson, 2014; Mangione, Borden, Nadkarni, Evarts, & Hyde, 2018), even up to 15 years later (Callahan & Watkins, 2018; Mallinckrodt & Gelso, 2002). Yet several challenges are inherent in graduate-student mentoring, perhaps more so than for other developmental phases due to the all-encompassing nature of clinical-science training. Clinical-science graduate students are expected to develop core competencies across many domains including research, teaching, clinical work, and even mentoring or supervision. In addition, like their peers in other psychology subareas, clinical-science graduate students must build theoretical and methodological expertise while developing a research program that is complementary to but also distinct from their mentors’. Clinical-science research mentors

play a central role in helping students conceptualize and design studies, collect and analyze data, interpret and report results, and develop scientific-writing skills. Students also rely on their research mentors to guide their broader dissemination of research findings, including identifying opportunities to present research at conferences, building confidence and skill in oral presentations and fielding questions while also contextualizing this within the bigger picture of students' strengths, areas for growth, and long-term goals. In these ways, the experience of graduate mentoring in clinical science is broad and challenges mentors to advise on an array of content and professional skill domains, while helping students to envision and plan for their overall trajectory.

Compounding these challenges, graduate mentoring over a 5- to 6-year period often requires adaptation to change (Johnson, 2014). Students' interests or goals often shift, mentors' research programs or lab structures may change, and students' personal lives may evolve (e.g., they may marry or have children). Thus, mentors need to help students through these transitions and must maintain the flexibility to help students find their own paths that align with changing interests or goals. A mentor may be called upon to serve as teacher, boss/supervisor, therapist, coach, colleague, taskmaster and/or friend. Some of these roles may be concurrent and even conflict, necessitating careful navigation (Johnson, Jensen, Sera, & Cimborra, 2018). At times, the mentor's loyalty may be tested as the mentor may be in multiple competing relationships with the mentee, serving, for instance, as the mentee's clinical supervisor, research supervisor, and employer at the same time. If the demands of these different roles are in competition with one another (e.g., the mentor believes it would benefit the student's professional-development goals more to spend time in clinical work but it would benefit the mentee's research goals [and perhaps the mentor's own goals] for the mentee to work on a research project), the mentor may be faced with a challenge. These challenges may be offset by helping students build other relationships to facilitate professional-development opportunities, find support for challenging elements of the research process (e.g., statistics consultation), and garner additional feedback on research products (e.g., via committee members and outside collaborators). Nevertheless, "the" mentor is expected to serve as the primary guide.

Facilitating students' development of time management, prioritization, and work/life balance is another major task of effective graduate mentoring (Lundgren & Orsillo, 2012). If students are struggling with productivity, mentors may wish to point out when students should engage in self-care practices (e.g., sleep, exercise, socializing) or develop more efficient work habits and effective time-management practices. Alternatively, mentors may play the role of helping students identify inconsistencies between their career goals (e.g., becoming academic scientists) and their passions (e.g., clinical work or teaching). Graduate programs in clinical psychological science often convey, sometimes only implicitly, that there is one right or best path, typically that of the primary mentor. In contrast, effective mentorship involves helping students find their own best paths, those that they will find most fulfilling and navigating the emotional reactions (e.g., guilt, shame) they may have in response. It is natural for mentors to experience disap-

pointment when their students choose different paths than those with which they began graduate school. Thus, part of high-quality mentoring involves mentors addressing their own reactions to students' behavior in a way that does not impede students' goals.

A final characterization and challenge of graduate mentoring in clinical science is that it can be a lifelong commitment, if so desired by the mentee. Mentoring graduate students can encompass many stages of their careers (Kaslow, Bangasser, Grus, McCutcheon, & Fowler, 2018; Lundgren & Orsillo, 2012). For instance, mentors may advise students on their next career steps: clinical internship, postdoctoral fellowship, and faculty or other employment, on significant career opportunities (editorships, administrative roles), and even on complex negotiations as their careers progress. Yet, this may not be desired by all trainees, who for professional or personal reasons, may elect to reduce contact with their graduate school mentors and establish a more autonomous path. Given these numerous roles and challenges, investigation is sorely needed to identify successful mentoring approaches, specific techniques to avoid pitfalls, and optimal practices to foster students' development and maintain a successful, collaborative mentor-mentee relationship. We offer three suggestions to facilitate more research in this area.

First, successful graduate mentoring begins during admissions. In our experience, clinical scientists often seek candidates with the most impressive academic credentials, the best fit to ongoing research, and indicators suggesting a high degree of productivity (e.g., writing style, statistical acumen). However, mentors should also consider their own work style, pet peeves, and prior work history to generate an honest self-appraisal of the type of mentee with whom they work best. We would all like to believe that we can effectively mentor any trainee, but we are human, and as psychologists we especially may be able to recognize that not all human dyads have an equal chance of maintaining a mutually satisfactory working relationship. Some mentors may be especially effective in helping students develop a professional writing style, whereas others may feel most adept inspiring students to generate novel hypotheses independently. Successful mentoring may be most likely when mentors have insight regarding their own strengths and weaknesses, and selected mentees who best fit with the array of professional and personal resources they are uniquely suited to provide.

Successful mentoring must also wrestle with role confusion. When mentors were trainees, they likely were exposed to varying expectations of graduate training. In some labs, graduate students are expected to work on lab projects or in other apprenticeship roles, regardless of any personal benefit gained from these experiences (i.e., an ethos of trainees "paying their dues"). In other labs, trainees may be expected to focus on their own projects almost exclusively. Some mentors may recall substantial opportunities to meet with their advisor, with frequent and specific instruction; others may recall considerable autonomy and reliance on peers for guidance. These varying experiences produce faculty with widely varying assumptions regarding their role as a mentor. Mentoring styles may vary considerably even within a department, a fact acutely perceived by graduate students who compare experiences between labs. There are few data to suggest whether one particular set of expectations or mentor roles is objectively more beneficial than another; however, mentors likely will benefit by gaining

awareness of their own style (especially as compared to their colleagues) and clearly articulating their proclivities with prospective and current students. Many difficulties within mentor–mentee relationships are mismatches between mentors' expectations and mentees' needs that could be reduced through improved communication (e.g., Hagerty, Barger, Taylor, Carter, & Gruber, 2018). Communicating clearly with mentees may help ensure that graduate students know what to expect from their mentor and vice versa.

Role confusion also may emerge from many mentors' dual capacity as their graduate student's academic advisor and also as their direct research supervisor, perhaps even the student's source of funding. These distinct roles often provide challenges to mentors who may, on the one hand, want to support a trainee who is experiencing personal or professional difficulties completing graduate schoolwork, yet simultaneously has a vested interest in this same trainee's successful completion of research requirements to ensure that the mentor's project is progressing as intended or as required by funding agencies. As with other types of role confusion, this dilemma often may be addressed by explicitly communicating to trainees when a mentor feels torn between two sets of expectations, wishes, or needs. By explaining to students why a shuffling of responsibilities may be needed, or why deadlines cannot be extended, for example, it often is easier for graduate students to make appropriate attributions regarding their mentor's behavior (e.g., reducing a student's responsibilities due not to perceptions of incompetence but to programmatic needs), and perhaps serving as a model to trainees for how they can similarly discuss complex decision-making with their mentor or when they become a mentor themselves.

As with undergraduates, greater attention is needed on graduate students' increasingly common experience in multiple-mentor relationships, which may have many benefits. Mentors at multiple levels of seniority can help to offset differences in individual mentoring styles and may work to eliminate discrepancies that disadvantage students from underrepresented and/or diverse backgrounds. On the other hand, the introduction of multiple mentors can introduce new challenges, such as the need for mentees to navigate multiple relationships and addressing potentially conflicting guidance from mentors; these challenges may be particularly acute for students who are already vulnerable (e.g., female and underrepresented students). Mentoring with multicultural humility is as important for graduate-student training as for undergraduate training, perhaps even more so given the frequency and intensity of mentor-graduate student interactions. These issues are embedded within the larger institutional context in which mentor–mentee interactions reside. Do mentors receive regular evaluations? What strategies are in place for intervening when the mentor–mentee match is poor or deteriorates? Are there clear guidelines regarding what constitutes unethical conduct and how to deal with it in a way that protects vulnerable parties? A healthy institutional context should facilitate regular discussions about mentoring and offer material support for the mentoring role, as well as for trainees who encounter challenging mentor experiences. This is particularly important when addressing concerns with professional behavior and power dynamics of mentor–mentee relationships. We live in a historical moment of awareness surrounding the ways in which power-discrepant relationships can be mishandled (e.g., #MeToo movement), and mentors must be cognizant of the implicit dom-

inance and they possess. This is especially key in considering that mentors are expected—and sometimes required—to financially support their trainees, creating additional dependence upon mentors.

It is critical for graduate mentors to remain attuned to the developmental process that is inherently part of graduate-school experience, reflecting students' changing interests, goals, skills, and desire for autonomy. Like successful parents, mentors should allow mentees to explore freely and safely during this transition period, without fear of disappointing powerful authority figures. Many clinical-science faculty hope to “raise” mentees who will make impactful scholarly contributions. However, it may be better for mentors to focus on, and explicitly communicate, that they wish to raise mentees who will be happy and feel fulfilled, regardless of the career path they choose. This seemingly trite suggestion has profound implications for the structure and content of routine advising meetings, mutual decisions regarding which projects graduate students will undertake, the selection of practicum and volunteer opportunities, and perhaps most importantly, the creation of a safe culture in which mentees can honestly and vulnerably seek the guidance and input that mentors have to offer. Like any relationship, creation of a foundation of trust, nurturance, and support is the best context for a mentee to experience maximal growth. In the final year before internship, successful graduate mentoring includes being receptive to discussions with students of how to make tough choices and compromises (e.g., where to apply for clinical internships), and reconciling those in the context of important relationships or geographical preferences. Mentees may need help negotiating (a) delegation of key aspects of the dissertation research (e.g., final data collection) to other lab members and (b) a timeline for completion of key milestones (e.g., data analysis, dissertation drafts), to remain on track for graduation, while being realistic about the time demands of internship.

Clinical Internship and Postdoctoral Fellow Research Mentoring

The clinical internship and postdoctoral years can be among the most rewarding periods for mentoring because these mentors get to witness the birth of an autonomous scholar with an established identity beyond affiliations with any institution or mentor. Mentees also begin to master their experiences of imposter syndrome, and to assert themselves as legitimate “experts” in one or more domains of clinical science. In clinical psychology, and particularly clinical science, the experiences during internship versus postdoctoral fellowship years can be quite distinct, so each is discussed separately in the following text.

Clinical internship. There are several unique considerations with respect to research mentoring during the predoctoral internship year, which is typically a time of significant personal and professional transition for clinical-science graduate students. Now considered to be the “capstone” experience in clinical training prior to receipt of the doctoral degree (McQuaid & Spirito, 2012), the internship typically involves a departure from the graduate-school institution, requiring a move to a new geographical location. Within just 1 year, students may find themselves balancing the personal demands of relocation (e.g., costs and efforts associated with a move and adapting to a new environment) with an adjustment to the people, culture, and training expectations of a

new institution, in addition to completing any remaining requirements of their graduate institution and—given the time-limited nature of the internship year—planning for and take the next steps in their professional lives. Whether that is a postdoctoral fellowship, faculty position, or something else, it often entails such time-consuming activities as completing applications and traveling to interviews. Hence, ongoing mentorship during this transitional time remains critical, which we discuss further in the next section.

For students emerging from clinical-science programs, the internship may also require a significant decrease in the proportion of effort toward research one has allocated to date. Even for internships with protected research time, this year is largely dedicated to clinical training. The transition to a largely clinical role during internship may be an adjustment not only for clinical-science students, but also for their graduate mentors “back home,” particularly with respect to expectations for research productivity. Making these adjustments is essential, as encouraging students to focus on providing high-quality, evidence-based clinical services is an ethical mandate.

Another consideration is that the internship year is often when graduate students begin to transition out of their mentor’s laboratory. The mentorship relationship may shift and evolve as students move toward professional independence. As such, this year is also an important time to plan for continued collaborations and future directions including refocusing dissertation research on article submission, as well as completion of other ongoing collaborative research projects. These will require ongoing mentorship, albeit from a distance. Time permitting, it can be beneficial to maintain a regularly scheduled meeting, either by telephone or videoconference, to facilitate continuity in the collaborative work between graduate mentor and trainee. Especially for (though not limited to) students who find themselves at internship sites with minimal opportunities for research, this ongoing relationship with the graduate mentor may be critical for maintaining research productivity and progress over the year.

There have been some efforts to advance a focus on clinical science within internship training (Atkins, Strauman, Cyranowski, & Kolden, 2014; McQuaid & Spirito, 2012; Spirito et al., 2007), and students may find themselves with new research opportunities and mentorship in their new settings. As described by McQuaid and Spirito (2012), students may encounter a continuum of research-training options on internship dictated at the program level, ranging from application of research knowledge on a clinical rotation (e.g., use of empirically supported assessments or interventions), to didactics, active participation in a new mentor’s research and, in some cases, an opportunity to conduct an independent research study or receive mentoring in grant writing, all of which will vary depending on institutional focus and resources. Complementing this perspective, Atkins and colleagues (2014) highlighted certain content areas that may be especially amenable to research training during internship, given its applied focus, such as a focus on assessment or intervention research, program evaluation, and/or training in dissemination and implementation methodologies. Students may find such opportunities useful in informing their existing research programs, and in some cases, inspiring a pivot to new directions.

For the research mentor in this context, it will be critical to assess students’ research objectives for the internship year, and to work collaboratively with them to set concrete goals that are

realistic within the structure of the internship, including the time allotted for research, if any. This goal setting must be balanced against students’ ongoing research commitments at the graduate institution, potentially including completing the dissertation, as well as potential personal commitments including long-distance relationships with partners at their home institution or elsewhere.

Postdoctoral fellows. Postdocs are at the precipice of complete autonomy, but sometimes need a little push to feel ready for launch. Having recently endured a remarkably rigorous and highly evaluative clinical internship process, many postdocs initially feel somewhat uncertain or even skeptical regarding their abilities. Thus, a main goal for the postdoc mentor is to help mentees feel that they are as capable and prepared (or unprepared) as many faculty members once were at the same stage in their training. Indeed, as with mentoring graduate students, mentoring postdocs may be most successful when mentors openly express their own uncertainties, past challenges, and areas of perceived weakness. Postdocs learn from their mentors how best to acknowledge one’s own limitations, and how to cope with human moments of insecurity, to seek consultation when needed, and to persist despite inevitable hassles and disappointments.

Of course, postdoctoral mentoring also has unique challenges. Unlike most relatively standardized components of graduate student and internship training, postdoc positions vary widely in roles and responsibilities. In some cases, research postdocs are asked to serve as project coordinators; in others, they are offered substantial time to write grants and articles, and to pursue their own research program. This may be complicated further by the need to accrue clinical hours toward licensure requirements. Negotiating mentees’ training goals and activities may require substantial dialogue. Moreover, the balance of activities may change between the initial and subsequent years of postdoc. Successful postdoc mentoring thus requires added flexibility to help ensure that the fellowship experiences are well-matched to mentees’ evolving needs. For instance, mentors might assume dual roles as both clinical supervisor and principal investigator within the first postdoc year, and the roles of a collaborator and peer/colleague subsequently (this can also be true for graduate mentors).

Inherent in every postdoctoral experience is the search for a “permanent” job. Thus, a final consideration for the postdoc mentor is to focus on professional development training that hones mentees’ skills in (a) conceptualizing and framing their research program, (b) writing clearly and boldly about prior experiences and goals in research and teaching statements, (c) constructing and delivering a job talk, (d) fielding questions about their research, (e) preparing for job interviews, and (f) negotiating job offers. Moreover, postdocs will benefit from guidance regarding career options and the lifelong juggling of personal and professional ideals including expectations of a romantic partner or spouse (also true during graduate school and when applying for clinical internship), or demands of parenthood, for example. Every day is a challenge and many requisite decisions represent compromises. The postdoc mentor can offer invaluable guidance and modeling to assist mentees in beginning their journey as trained clinical scientists.

Emerging challenges. Promoting multiple mentoring opportunities remains challenging during this advanced training phase, when trainees may feel pressured to “narrow” their focus and hone their specialization and may even be reliant on a single postdoctoral mentor for much of their guidance. A need for multiple career

perspectives is most needed at this time of life—whether deciding career options, seeking feedback on job applications, or building potential future collaborations as an emerging independent investigator. Issues of underrepresentation become more salient as women and minorities are most vulnerable to attrition in future tenure-track research careers (e.g., *APA Committee on Women in Psychology, 2017*). Mentoring efforts and evidence-based research on how best to retain successful women and underrepresented trainees in the field at this critical career juncture is warranted. Institutional context is perhaps nowhere more salient than during clinical internship. Because the internship year is a time of transition and planning for next steps, research mentors at the internship site may also find themselves in the position of providing significant guidance around new research directions, as well as postdoctoral-fellowship and faculty-position applications and decision-making. Recognizing complex power dynamics that may exist for students who begin internship training with significant, ongoing relationships with their graduate mentors, internship mentors may find themselves in the particularly delicate position of providing guidance around fairly substantive professional decisions, but with much less time to establish a working relationship with the intern. In that respect, internship mentors can offer guidance while simultaneously respecting that of interns' home-institutions' mentors, who may have greater knowledge of students' strengths, interests, and professional goals.

Early-Faculty Research Mentoring

Compared with that on mentoring students, the literature on mentoring faculty is far more limited, tending to be descriptive (e.g., narratives of types of mentoring programs, essays on how to mentor and on what junior faculty need) rather than empirical, and even that is largely based on case studies, surveys, and studies of mentoring programs without control groups, although there are exceptions (e.g., *Blau, Currie, Croson, & Ginther, 2010*). Further, most published studies had relatively small samples, and many focus on training in academic medical centers (e.g., *Fleming et al., 2015; Steele, Fisman, & Davidson, 2013*), military centers (e.g., *McMains et al., 2018; O'Neil et al., 2015*), and other nonpsychology academic programs (e.g., *Moss, Teshima, & Leszcz, 2008*). Indeed, we were unable to locate any empirical studies of research mentoring of faculty in clinical psychological science or clinical psychology more broadly. Clearly, this is a significant gap in the literature.

That said, the existing literature clearly supports the value of mentoring junior faculty. For example, in the only randomized controlled trial that we could locate, *Blau et al. (2010)* studied women faculty in economics departments. They found that, compared with those who did not participate in a mentoring program ($n = 91$), those who did ($n = 126$) had more publications in top-tier journals. In a noncontrolled study, *Yager, Waitzkin, Parker, and Duran (2007)* found that the large majority of the 19 participants in a mentoring program (ethnic minority faculty in academic psychiatry departments) had submitted grant proposals, were awarded funding, and/or had been promoted. Similarly, *Reynolds, Pilkonis, Kupfer, Dunn, and Pincus (2007)* found that 17 of 22 participants in a mentoring program in an academic psychiatry department had received funding for grant applications written during the mentoring program. Importantly, both the Yager

et al. and Reynolds et al. programs involved funding and release time for mentees and required a great deal of infrastructure. Nonetheless, participants in other types of mentoring programs (e.g., "typical" mentor–mentee, peer mentoring, facilitated peer mentoring, team mentoring) generally report satisfaction and positive outcomes (e.g., *Fleming et al., 2015*). Such outcomes likely are no different for faculty in clinical psychological science.

In addition to the general positive effect of mentoring, the literature also suggests that no single mentoring program is clearly better than any other. Indeed, future research might focus on moderators of mentoring effects, particularly on the question of for whom do different types of mentoring work best, with an eye toward more personalized mentoring approaches. On the other hand, the literature suggests that there is a common set of needs or issues that pertain to mentoring faculty. Thus, we provide a detailed list of issues that may be relevant to mentoring junior faculty in particular (see *Part B* of the online supplemental material). Here we focus on three common issues. First is mentoring that assists junior faculty in conducting research and in writing and submitting articles and grants in a timely fashion to complete the work necessary for tenure and promotion. Mentoring in this arena ranges from the very practical and seemingly simple (e.g., how to purchase equipment at one's university) to the personal and/or interpersonal (e.g., how not to let perfectionism impeded progress; how to network effectively with colleagues; how to connect mentees with colleagues at professional conferences).

Second, faculty must learn how to run a successful, productive research lab, which goes hand-in-hand with completing the work for promotion and tenure and is critical for ongoing job satisfaction. Numerous essays have highlighted the challenges and discussed the types of mentoring needed here (e.g., *Norris, Dirnagl, Zigmond, Thompson-Peer, & Chow, 2018*). Mentors of clinical scientists may consider encouraging a "vertical team" model (*Johnson, 2016*), which gives more senior students opportunities to mentor junior students.

Third, early career faculty may face new professional development and service roles. Although the success of all junior faculty is aided by protecting their time, professional service (e.g., ad hoc reviewer and/or editorial board member) is typically a necessary component of faculty careers and relevant for promotion and tenure. Mentors can play a key role in helping mentees select appropriate activities and can guide mentees toward roles that will increase their knowledge of clinical science at the field level. This will also increase their visibility among other clinical scientists, which, in turn, can feed back into success with tenure and promotion.

Early faculty also need mentoring in multiple areas (e.g., research, grant writing, teaching, navigating the university), so having multiple mentors, with different strengths and areas of expertise, may be helpful. Diverse and underrepresented faculty have unique needs for mentoring; having mentors who understand the challenges they face and/or can help them find resources is critical (e.g., *Rockquemore, 2011*). Some institutions have developed mentoring programs designed to increase diversity in the academy, or partnered with outside groups with a similar mission (e.g., the National Center for Faculty Development and Diversity), whereas others may focus on bias and sensitivity training for individual faculty members who may serve as mentors.

Faculty also need mentoring to help them understand and navigate their institution context. Similarly, faculty should be aware that institutions have different approaches to mentoring and different expectations for promotion and tenure. Further, individuals in potential mentoring roles should be encouraged to create effective mentoring structures within their institution. Finally, research ethics, norms for professional behavior, codes of conduct, and awareness and management of power dynamics and hierarchical relationships are important targets for mentoring. Mentors should pay particular attention to these issues, not only didactically, but in the nature of the mentoring relationship and what they model for mentees.

The Path Forward

In the preceding sections, we reviewed some of the most pressing issues in our field that affect and underlie the effective mentoring of future and emerging clinical scientists. In this closing section, we widen the lens to pose bigger picture questions that the field should be ready to consider.

How should mentors be trained? Mentors receive little, if any, formal training in *how* to be an effective mentor. This becomes more pressing as the landscape of *what* to mentor students in or about rapidly evolves, including the acceleration of novel methodological tools to address pressing clinical-science issues (e.g., mobile health technologies, open-science reforms, advanced computational-modeling tools) and changing landscapes for career settings (e.g., some NIH-funded research T32 training programs support careers in industry settings, but many faculty do not possess the requisite knowledge of industry-tailored norms and expectations to be competitive). We must grapple with how mentors can best train their mentees in skills and institutional contexts with which mentors themselves may not be familiar.

How do we measure good mentoring? Despite the lack of consensus around what constitutes good mentoring, we continue to evaluate faculty—and base their careers—on unreliable and unstandardized indices of mentoring effectiveness that are prone to bias (e.g., against women and members of underrepresented groups). Further, the fact that mentors are beholden to the evaluation of their mentees can, to some extent, limit mentors' capacity to follow their instincts and exercise judgments based on prior experience. Any system of mentor evaluation that is based on the premise that good mentoring is that which results in high levels of mentee satisfaction seems incomplete and potentially self-defeating. Much like clinical work itself, which often involves discomfort on the client's part, we note that good mentorship often involves the mentor acting in ways that expose the mentee to some potential for distress (e.g., feeling challenged, taking risks, accepting uncertainty, asserting one's rights and beliefs, receiving candid criticism).

As noted earlier, there is a dearth of prospective research, particularly using methods other than self-report (e.g., Callahan & Watkins, 2018; Johnson, 2014). There is a clear imperative for our field to apply the best methods in its scientific toolbox to build a body of research on evidence-based mentoring. Observational studies and studies that obtain reports from pairs of mentors and mentees are needed to determine how these perspectives correspond to each other and with observable behavior, and the factors associated with disagreement. Such work will depend on

our devising and operationalizing reliable and valid measures of mentoring, career outcomes, and mentee and mentor satisfaction; collecting and pooling comparable data from different training programs; and using proper experimental and quasi-experimental designs to test critical mentoring questions. As the context and demands of clinical-science training and careers differ in significant ways from other areas of psychology, it is important to tailor these measures to specific domain practices and outcomes.

What are the most important goals of mentoring? A recurring theme throughout this article is the importance of measurable outcomes for evaluating the effectiveness of mentoring. But which outcomes are most important? The answer to this fundamental question may differ by one's perspective. As clinical-science mentors, it is reasonable to endorse the goal of scaffolding students' development into academic researchers who will seek the answers to clinically relevant questions and/or translational scientists who will bridge the science-to-practice gap. But clinical-science mentors will also be called upon to scaffold students' development into practicing clinicians who can competently deliver evidence-based and culturally sensitive treatments. How should we address and prioritize these quite different outcomes? Moreover, not all outcomes are career centric. Thus, this article raises the issue of promoting happiness as an important goal of mentoring. It is difficult to argue against the virtues of having happy mentors and mentees, and mentees should support a pathway to satisfying mentees' professional goals that may affect their happiness, yet whether one achieves happiness falls outside of the boundaries of what professional mentors can be expected to provide. Likewise, how do we weigh happiness as an outcome compared to needs for discoveries, methods, insights, treatments, and cures that will largely determine the future of our field?

How many mentors is best? We began this article with reference to the myth of Odysseus in which mentoring falls within the hands of a single "guru." This mentor model has carried over time to current graduate-student admissions decisions and models of mentoring—students typically apply to work with a single mentor who oversees their training and professional development, provides emotional support, and often is held responsible for their success or failure. Yet everyday experience suggests a radically different reality: Mentoring is an endeavor of "villages" rather than individuals. Students typically receive mentoring from a variety of sources in addition to their primary research mentor, including course instructors, directors of clinical training, on-site statisticians, and other clinical and nonclinical faculty. Moreover, much mentoring comes from peers—other students who provide moral and informal professional support, including transmission of the programs' values and psychoeducation on program and laboratory goals and expectations. This village approach is consistent with team-science approaches common in our fast-paced, growing, interdisciplinary field. The time may be ripe for clinical science to migrate toward a more fitting village model of mentoring. And yet, as the field moves toward increasingly complex networks of interdisciplinary teams of scientists, and thus increasing nuanced mentorship networks, this also creates additional complexity in terms of the interrelationships among team members, which has the potential to create unique challenges and opportunities for the mentors. The need for greater understanding of effective mentoring and leadership in these complex interdis-

ciplinary team science models has never been greater (e.g., Salazar & Lant, 2018).

Is there a dark side to mentoring? A harrowing and popular fable of unconditional devotion, Shel Silverstein's *The Giving Tree* (Silverstein, 1964) teaches us that if we give away too much of ourselves we may suffer. Yet many good mentors spend countless hours in meetings with students, responding to endless seas of emails, working outside "regular business hours" or during sabbaticals and even parental leaves to be responsive to trainees. This type of mentoring can overlap personal and professional resources, resulting in burnout or a failure to fulfill other professional responsibilities and expectations. Moreover, mentoring demands are not distributed evenly throughout the profession, with some groups (based on gender, sexual orientation, ethnicity, age, etc.) facing disproportionate demands and expectations. Yet there are rarely formal discussions or infrastructures to support faculty through challenging mentoring scenarios, at a cost to both mentors and their trainees. We recommend that clinical science consider enhancing infrastructure and institutional incentives (e.g., weighting mentoring into tenure and promotion decisions) for mentors to help them guide the next generation of clinical scientists.

Caveats

As a generalist piece, our article has focused chiefly on mentoring a generation of clinical scientists who enter training equipped for the task at hand and ready to engage in the mentorship relationship. However, as most mentors can attest, a subset of mentees begin their training with significant challenges that disadvantage them in terms of their ability to benefit from their educational experiences, including the mentorship relationship. Mentoring these trainees may pose different challenges and the comments offered here are not intended to encompass all types of mentorship experiences. Moreover, we acknowledge that it was not possible in this article both to address the breadth of the topic—mentoring issues from undergraduates through to many later stages of professional careers—and also to address in depth the issues and challenges that are unique to each stage (e.g., graduate students vs. early career faculty). Which path to follow was a difficult decision to make, but ultimately we felt that for an initial article on the topic, it was most important to present a broad view of the field, commenting in brief on the complete developmental trajectory of clinical scientists, rather than to focus more deeply on specific developmental phases. We hope that our article will inspire subsequent articles to focus more deeply on the various phases of lifelong career development.

Concluding Comments

Effective mentoring is a critical ingredient in the recipe for creating superb science and scientists, yet the process and outcomes of good mentoring remain elusive. We hope this article begins an overdue discussion of what mentoring means, as well as how we can best study and measure it using our field's best research practices to improve it. We must face these issues as a field, as well as individually within departments, before we can determine what truly constitutes best practices in research mentoring.

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If you are interested in reviewing manuscripts for APA journals, the APA Publications and Communications Board would like to invite your participation. Manuscript reviewers are vital to the publications process. As a reviewer, you would gain valuable experience in publishing. The P&C Board is particularly interested in encouraging members of underrepresented groups to participate more in this process.

If you are interested in reviewing manuscripts, please write APA Journals at Reviewers@apa.org. Please note the following important points:

- To be selected as a reviewer, you must have published articles in peer-reviewed journals. The experience of publishing provides a reviewer with the basis for preparing a thorough, objective review.
- To be selected, it is critical to be a regular reader of the five to six empirical journals that are most central to the area or journal for which you would like to review. Current knowledge of recently published research provides a reviewer with the knowledge base to evaluate a new submission within the context of existing research.
- To select the appropriate reviewers for each manuscript, the editor needs detailed information. Please include with your letter your vita. In the letter, please identify which APA journal(s) you are interested in, and describe your area of expertise. Be as specific as possible. For example, “social psychology” is not sufficient—you would need to specify “social cognition” or “attitude change” as well.
- Reviewing a manuscript takes time (1–4 hours per manuscript reviewed). If you are selected to review a manuscript, be prepared to invest the necessary time to evaluate the manuscript thoroughly.

APA now has an online video course that provides guidance in reviewing manuscripts. To learn more about the course and to access the video, visit <http://www.apa.org/pubs/journals/resources/review-manuscript-ce-video.aspx>.