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Facilitating Pipeline Progress From Doctoral Degree to First Job

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The sequence of professional development within psychology from doctoral education to first job represents a period of remarkable professional and personal growth for each trainee. However, this sequence also contains a variety of barriers that hinder progress through the pipeline. The myriad individual-, program-, and system-level barriers encountered by trainees in health service/other applied service psychology and in research basic/applied psychology are identified. To actively and systematically facilitate improved passage through major transition points, individual trainee and trainer, program- and system-level action steps are recommended. In addition, emphasis is placed on ensuring that the psychology education and training culture prioritizes the progress, creativity, and flourishing of trainees and supports their movement through branching pipelines in their training and in their careers.

Keywords: professional development, training, employment, barriers, flourishing

The educational pipeline is a series of successive transitions in the education and training sequence leading to workforce entry. Historically, the construct has emphasized progress in the K–12 system, allowing for advancement into, and graduation from, colleges and universities that ensures an educated workforce for our nation. Recently, the pipeline concept has been extended to graduate school, postdoctoral training, and employment for people with their doctorate (Fuhrmann, Halme, O'Sullivan, & Lindstaedt, 2011). There has been discourse about strategies for improving the pipeline that include attending to infrastructure and community-level factors, implementing programs that address endangered pipelines, calling for leaders to ensure that diverse professionals are welcomed and supported in their advancement, and initiating policies designed to yield a more diverse workplace (Bartels et al., 2010; Fassinger, 2008).

Within psychology, the stages of the pipeline typically include undergraduate education, graduate education, doctoral internship training (if applicable), postdoctoral training (if applicable), and employment. Unfortunately, little attention has been paid to transitions between these pipeline stages, such as selecting psychology as an undergraduate major, applying to and getting accepted into a doctoral program (which may include a masters or require a prior masters), applying and matching with a doctoral internship program, obtaining postdoctoral placement, becoming licensed (if applicable), and securing employment and possibly subsequent employment. Stages of pipeline leakage most often occur for those in the health service/other applied service track at the following transitions: obtaining a doctoral internship if applicable, securing a postdoctoral position, and gaining employment (Doran & Cimbora, 2016; Grus, McCutcheon, & Berry, 2011; Hatcher, 2014; Robiner & Crew, 2000). These transitions are challenging because of the internship supply–demand imbalance, the limited number or maldistribution of postdoctoral positions, jurisdictional variability in licensure requirements, and a mismatch between training experiences and marketplace

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demands. Stages of pipeline leaking are most likely to occur for those on the research basic/applied tracks at the following transitions: pursuing postdoctoral training, leaving postdoctoral training, and securing a desired position ("Committee to Review", 2014; Sauermann & Roach, 2012; Su, 2013). These transitions are challenging because of questions about the value of postdoctoral training and the limited available funding, the lack of academic jobs, growing demands for scholarly productivity for job attainment, trainers' desire for postdoctoral trainees to remain in their laboratory to ensure optimal productivity, and lack of preparation for nonacademic positions.

A limited literature addresses the pipeline in psychology from doctoral education to first job. This nascent body of work highlights the importance of attending to individual, interpersonal, institutional, and societal–community factors in conceptualizing the pipeline (Gibbs, McGready, Bennett, & Griffin, 2014; Maton, Kohout, Wicherski, Leary, & Vinokurov, 2006; Snyder & Elliott, 2005). It also includes some recommendations of strategies for reducing the leaky pipeline for diverse individuals who have higher attrition rates secondary to discrimination and implicit bias, managing specific pipeline transition challenges, and gathering workforce data (Callahan, Hogan, Klonoff, & Collins, 2014; "Committee to Review", 2014; Hatcher, 2014; Robiner & Crew, 2000; Rogers & Molina, 2006). However, to date, there has been no comprehensive discussion of facilitators and barriers related to pipeline transitions, nor systematic attention to trainer (i.e., faculty, supervisors, advisors, and mentors at all training levels), program level, or systemic strategies for improving psychology trainees' progress through the pipeline.

Given that trainees (i.e., doctoral students, doctoral interns, and postdoctoral trainees, e.g., fellows/residents/scholars) are the future of psychology, one of psychology's highest priorities must be on ensuring their advancement through the pipeline. To give prominent attention to ensuring the success of doctoral trainees as they transition to early career psychologists, the 2014 President of the American Psychological Association convened the Opening Doors Summit: Doctoral Education to First Job. Building upon conversations at the Summit, this article focuses on the pipeline transitions of both health service/other applied service psychologists and research basic/applied psychologists, targets transitions beyond the internship imbalance and extended postdoctoral experience, and offers strategies for preparing people to pursue multiple career trajectories. Guided by an ecological framework, attention is paid to trainee, trainer, program, and systemic facilitators and barriers that influence progress through the pipeline. Recommendations and actions steps to foster positive transitions are delineated. These recommendations and action steps build upon best practices in training programs and our prior publication from this Summit, which focused on capitalizing on the ways in which an education in psychology that integrates instruction in core knowledge of the discipline, with an emphasis on scientific subfields or health service/other applied service specialization, can optimally prepare a competent workforce (Bangasser et al., 2016). This prior work did not attend, however, to factors that facilitated pipeline transitions or to potential strategies for fostering pipeline progress. When possible, the literature supporting our recommendations related to supporting pipeline progress is included. However, given the relative newness of this emphasis within psychology, relevant data often are lacking. Thus, future efforts must be devoted to empirically investigating the utility and effectiveness of the recommendations provided.

Factors That Influence Progress Through the Pipeline

A comprehensive look at factors that influence pipeline movement suggests that trainee, trainer, program, and systemic factors and their interactions must be considered. Given that a factor's presence/absence can be linked with progress and the reverse with slowing or leakage, the focus will be on facilitators except when data exist on barriers. We recognize the studies cited offer only incremental information and before a more definitive and nuanced understanding of the relevant factors can be attained, more methodologically sophisticated and comprehensive investigations are needed. Moreover, because of the lack of sufficient data and space considerations, we focus broadly on facilitative factors and do not address differences in facilitators across pipeline transitions. More data are needed before a devel-

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opmentally specific perspective can be taken. Furthermore, additional study is needed to determine the extent to which each variable is amenable to remediation and the nature of the remediation that would be most effective.

Trainee Factors

Accomplishments. Completing academic requirements facilitates transitioning out of graduate school to the next professional activity (Ginkel, Davis, & Michael, 2010; Rodolfa et al., 1999). Being a productive scholar and amassing relevant experiences predicts pipeline transitions for both categories of psychologists (i.e., health service/other applied service, research basic/applied; Bair & Haworth, 2004; Callahan et al., 2014; Ginkel et al., 2010; Lund, Bouchard, & Thomas, 2016). The qualities associated with these accomplishments (e.g., intelligence, hard work, persistence, motivation) are linked to positive progress (Bair & Haworth, 2004; Forehand, 2008).

Personality and interpersonal factors. Academic performance and success, internship match rates, and attainment of postdoctoral positions and jobs are predicted by openness, conscientiousness, and extraversion (Callahan et al., 2014; Poropat, 2009). Progress also is associated with self-reflection and self-awareness, emotional intelligence, professionalism, and good relationships (Bair & Haworth, 2004; Ginkel et al., 2010). Personality traits that indicate professionalism or interpersonal problems negatively impact progress (Ginkel et al., 2010). For example, concerns about a trainee's professional demeanor are a highly ranked exclusion criterion for the doctoral internship selection process (Ginkel et al., 2010).

Goodness of fit. The goodness of fit between individual trainees and trainers, particularly in terms of work styles and interests, is critical to advancement (Forehand, 2008). Goodness of fit is associated with a strong, positive relationship characterized by frequent contact, ease of interaction, mutual trust and respect, and collegiality (Bair & Haworth, 2004). One factor that complicates this fit if not addressed is a lack of generational matching in terms of work–life integration, approaches to learning and teaching/supervising, and career choices (Twenge & Campbell, 2008). In addition, trainee program goodness of fit facilitates progress when there is a high level of satisfaction with one's program and a match between the trainee's goals and the program's opportunities (Bair & Haworth, 2004; Ginkel et al., 2010). It can be impeded if there is a lack of fit academically and socially (Smith, Maroney, Nelson, Abel, & Abel, 2006). For example, there are higher rates of attrition from doctoral programs for trainees with personal demands outside the academic environment that make it challenging for them to have the time the program expects them to devote to their coursework and scholarship (Smith et al., 2006).

Trainer Factors

Professional competence. Trainers facilitate trainees' progress when they are competent in their own endeavors and in the activities focal to the training they provide, provide useful information and guidance, and are dedicated to training, career sponsorship, and coaching (Bair & Haworth, 2004). They also serve a facilitative role when they display a high level of emotional competence (O'Meara, Knudsen, & Jones, 2013). Trainers who are not just teachers, supervisors, or advisors, but who also are dedicated to serving as mentors positively contribute to their trainees' pipeline movement (Lunsford, 2012).

Investment in trainees' development. Effective trainers are accessible, approachable, supportive, and encouraging (Bair & Haworth, 2004). They empower trainees to develop a sense of agency and determine their own career paths (O'Meara et al., 2014). They are intentionally invested in their trainees' success and use their trainees' definitions of positive outcomes.

Program Factors

Status and nature. A program's status and nature can contribute to pipeline movement. For example, for health service psychology (HSP) trainees, attendance at a program accredited by the American Psychological Association (APA) or the Canadian Psychological Association can positively impact progress (e.g., securing an internship, passing the licensure examination, attaining employment; Schaffer et al., 2012). Similarly, HSP trainees from research inten-

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sive programs and programs ranked highly in *U.S. News and World Report* have higher licensure pass rates as well (Schaffer et al., 2012; Sharpless & Barber, 2009). For research basic/applied psychologists, department level-rankings predict post-PhD employment rates even when controlling for the academic accomplishments of the individual (Stenstrom, Curtis, & Iyer, 2013). For doctoral graduates in the sciences, participating in interdisciplinary dissertation research is associated with a greater likelihood of attaining an academic job postdegree (Millar, 2013). Elements of a program's status and nature that support the transition through one pipeline time-point tend to do so for multiple time-points (Sharpless & Barber, 2009).

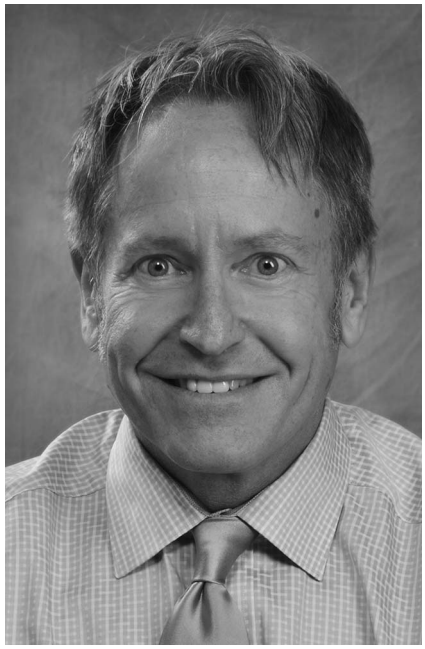
Infrastructure. Myriad program infrastructure elements influence pipeline movement. Transitioning out of the doctoral program and into the next phase of professional development is easier for trainees who matriculate in programs with smaller cohorts, reasonable duration to doctoral degree attainment, flexibility in scheduling, good access to resources and trainers, diverse opportunities, and appropriate financial support (Bair & Haworth, 2004; National Science Foundation & National Center for Science & Engineering Statistics, 2013; O'Meara et al., 2014; Schaffer et al., 2012; Sharpless & Barber, 2009; Smith et al., 2006). Movement is impeded by long duration to program completion, lack of program flexibility, lack of community in the program, limited training resources, demands on trainers to fund themselves and their trainees, and high program costs (Bair & Haworth, 2004; Smith et al., 2006). For example, trainees in doctoral programs that lack a sense of community are more likely to experience attrition (Lovitts, 2001). A high debt load and/or the need to work concurrently can further delay completion, lead to attrition, or result in employment decisions based on money rather than interest and satisfaction (Delisle, 2014; Doran, Kraha, Marks, Ameen, & El-Ghoroury, 2016).

Culture. Program culture influences pipeline progress. Progress is supported when programs prioritize professionalism and social support and are characterized by ethicality and integrity, respect for diversity, integration of trainees into the program's social and professional life, and available opportunities linked to potential later employment (Smith, Saavedra, Raeke, & O'Donell, 2007). It also is facilitated in programs that value and provide quality mentoring, especially when the role of mentor involves being a developer of a trainee's success (Baker & Griffin, 2010). Effective mentoring with trainees from marginalized groups reduces pipeline leakage and helps such trainees overcome workplace barriers specific to their group status (Fassinger, 2008; Rogers & Molina, 2006).

Systemic Factors

Inclusivity and opportunities. Sociodemographic factors have been associated with pipeline leakage and are categorized as systemic because institutional cultural, climate, policies, and practices interact with these factors to influence pipeline success (Malcolm & Malcolm, 2011). Historically, women have exited the pipeline more frequently than men (Shaw & Stanton, 2012). Despite the larger number of female than male trainees, fewer women apply to academic jobs than men (Shaw & Stanton, 2012). Although progress has been made, women in the sciences continue to face discrimination in the form of unequal pay, funding disparities, and chances for advancement (Shen, 2013). Disparities related to race/ethnicity occur at every pipeline stage and are cumulative, suggesting problems with transitions (Kohout, Pate II, & Maton, 2014). There is a gender by race/ethnicity interaction: Ethnic and racial minority women are more likely than their male and nonminority counterparts to stall early in the pipeline, prefer nonresearch-related careers, and have difficulties achieving positions of high rank and status (Gibbs et al., 2014). Professional identity is another systemic issue linked to pipeline leakage and reflects the general public's perception that psychology is not broad enough to include everyone trained as a psychologist. For example, there is anecdotal evidence that basic scientists transitioning to postdoctoral training or first job switch from identifying as having a doctorate in psychology to being neuroscientists (Rozensky, Tovian, & Sweet, 2014).

Bottlenecks. Imbalances between the number of available trainees in one pipeline phase and the number of available positions in the next phase often make transitions problematic. While blockage occurs at all transitions, two transitions are particularly challenging: (a) graduate school



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to internship for HPS trainees and (b) postdoctoral training to first job for trainees in the research basic/applied areas seeking academic positions trainees. The internship imbalance refers to the longstanding gap between the number of applicants seeking an internship and the number of available positions in accredited programs (Doran & Cimbora, 2016; Grus et al., 2011; Hatcher, 2014). While the gap has narrowed in recent years, the imbalance remains a significant barrier to HSP trainees moving to the next phase. For trainees in the research basic/applied areas seeking faculty positions as their first job, a bottleneck results from the increasing duration of postdoctoral positions because of the requirements for securing a position and the dearth of available tenure track jobs (National Academy of Sciences, 2014).

Financial support. The nature and amount of financial support trainees receive impacts progress; insufficient support makes it difficult to remain on the trajectory (Bair & Haworth, 2004; Doran et al., 2016). Unfortunately, there is inadequate funding for either category of psychology trainees. Another financial factor that hinders pipeline progress and attainment of desired employment is inadequate funding for federal loan forgiveness programs. Funding for programs such as the National Health Service Corp and National Institute of Health Loan Repayment Program facilitate progression for some early career professionals interested in working with underserved populations or pursuing careers in biomedical, behavioral, social, and clinical research (Chu et al., 2012).

Pipeline preparation. The shift, particularly in health service/other applied service psychology, to competency-based education and training (American Psychological Association, 1999; Fouad et al., 2009; Hatcher et al., 2013; Health Service Psychology Education Collaborative, 2013; Kaslow et al., 2004) is intended to improve pipeline preparation and progression. The lack of definition and systematic assessment of necessary competencies in research basic/applied training may be a barrier to pipeline progress (Archer & Davison, 2008; Lester, 2014). Given that employers are most interested in professionalism and the capacity to interpret situations, self-reflect, be creative, utilize but go beyond established norms, act with intelligence and ethical literacy, problem-solve effectively, and demonstrate expertise, competency-based education and training likely would yield more positive transition-related outcomes if integrated with a capability framework. Such a framework emphasizes doing, creating, making, and actively participating (Lester, 2014). Before we can conclude with certainty that there is an association between competency-based education and training that is integrated with a capability framework and pipeline progressions, data are needed from studies that specifically examine this link.

Another systemic barrier related to pipeline preparation is that programs historically have failed to provide systematic training and mentorship about the breadth of workplace prospects and strategies for negotiating career transitions associated with diverse roles and responsibilities as a psychologist (Fuhrmann et al., 2011). Trainers often do not encourage or legitimize multiple career pathways outside of academic and, as such, do not adequately support trainees in having the requisite sense of agency with regard to their career advancement and associated pipeline transitions (O'Meara et al., 2014). As a result, trainees often lack knowledge about career options and how to successfully transition into them (National Academy of Sciences, 2014).

A third pertinent systemic factor relates to preparing trainees for emerging career pathways (i.e., career opportunities that are relatively new, pursued by few psychologists, labeled by some as nontraditional, and/or yet to be created/discovered). Unfortunately, programs tend not to educate trainees about employment in emerging career pathways (Fuhrmann et al., 2011; National Academy of Sciences, 2014; Sauermann & Roach, 2012). Trainers often are resistant to encouraging and assisting their trainees in exploring such opportunities and to facilitating their examination of the match between trainee career preferences and the types of career paths they might pursue (Sauermann & Roach, 2012).

Recommendations and Action Steps

In this section, recommendations and associated action steps are offered at the individual trainee, trainer, program,

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and systemic levels. Unfortunately, the empirical data to support these recommendations is sparse. Therefore, many of these proposals should be viewed as tentative at the present time. While some may argue that the lack of systematic data should preclude the delineation of recommendations, we believe these recommendations, many of which build upon practices in various training programs, can serve as a guiding framework for the conduct of relevant research to determine their efficacy and utility. Moreover, these proposals can in the interim inform psychology's efforts to address a critically important and underrepresented topic for the discipline.

Recommendations and Action Steps: Individual Trainee Level

Recommendation #1: Self-Reflect to Ensure Goodness of Fit and Maximize Success

To facilitate goodness of fit and pipeline transitions, trainees must be invested in accurate self-assessment and use the associated reflections to enhance their competence and make decisions regarding future directions (Prehar & Ignelzi, 2012). This self-reflective process is key to the professional development goal for undergraduate psychology majors and remains central to the professionalism of psychologists throughout their professional trajectories (American Psychological Association, 2013). Trainees' success in moving through the pipeline also is predicated on good decisions about the match between their strengths, weaknesses, and goals and the types of experiences the potential program or job setting can offer. The person–training/work environment fit is associated with selection decisions; attraction and retention; and work-related attitudes, action, and levels of satisfaction (Bretz & Judget, 1994).

Action steps.

#1 Engage in ongoing self-assessment about strengths, areas for growth, and career interests. When engaging in self-assessment, trainees should attend to their accomplishments, level of professionalism, effectiveness of interpersonal relationships, capacity for cultural humility and sensitivity, and interests/passions (Belar et al., 2001; Hodges et al., 2011). Such self-assessments will be most advantageous if trainees solicit input from trainers and mentors, peers, and colleagues either through informal discussion or more formally via a 360-degree evaluation (Kaslow et al., 2007). Such feedback hopefully can guide trainees' decisions about ways to optimize transitions and minimize challenges.

#2 Determine fit with career opportunities in psychology. Trainees should self-reflect about priorities vis-à-vis next steps in the pipeline (McIlveen et al., 2011). This self-reflection can be facilitated by reading books; seeking out websites with examples, tips, questions, and activities; conversing with trusted peers, family members, colleagues, trainers and mentors, and/or therapist; and using available career testing and planning services. Trainers and training programs can guide trainees through the process of career planning by offering structure for the self-reflection process (Blickley et al., 2013). Gathering such information and engaging in self-reflection and honest self-appraisal can guide selection of overall category of psychology, training programs, training opportunities, and context for first job. Given the competitiveness that surrounds each of the pipeline transitions, it behooves trainees to make decisions guided by genuine self-reflection, rather than to alter their training and career goals to match those of specific training programs in order to secure an interview or admission/match. This approach is misguided and likely to set the stage for later pipeline leakage.

Recommendation #2: Utilize Individualized Development Plans (IDPs)

IDPs (i.e., Professional Development Plan), are formalized, structured training plans tailored to a trainee's unique needs and career stage (National Academy of Sciences, 2014; Sigma XI & National Postdoctoral Association, 2016). They can facilitate a process in which trainees articulate and set career goals, identify needed resources and training, and hopefully move successfully through the pipeline. They can be used to facilitate a dialogue with trainers about relevant career-related experiences and help trainees and trainers identify professional development opportunities that already exist within the training environment (e.g., mentoring undergraduates in the lab), training institution (resume writing workshops at the institution), and profes-

sional societies. They may be useful in identifying missing opportunities and empowering trainers and trainees advocate for needed resources. While IDPs often are advocated for in structured training programs (National Academy of Sciences, 2014; Sigma XI & National Postdoctoral Association, 2006), they may be particularly beneficial in providing organization for trainees in unstructured programs such as informal postdoctoral experiences. IDPs can also be used to support lifelong learning and continued professional development after transition into the workforce (Li, Paterniti, Co, & West, 2010). APA developed an online, interactive IDP resource to assist trainees in seeking mentorship, engaging in self-assessment, exploring career opportunities, and implementing the IDP (http://www.apa.org/education/grad/individual-development-plan.aspx). Although, historically, utilization rates of IDPs have been relatively low, for trainees (i.e., postdoctoral researchers) and trainers who utilize them, the process is associated with enhanced identification of the requisite competencies for career success, better trainee–trainer communication related to career goals, enhanced trainees and trainer levels of satisfaction, and more manuscript and grant submissions (Hobin, Clifford, Dunn, Rich, & Justement, 2014; National Academy of Sciences, 2014; Sigma XI & National Postdoctoral Association, 2006). More research is needed to determine the extent to which IDP utilization bolsters trainees' progression and outcomes and their career pathways. For example, such research may compare the relative value of the IDP process versus focusing directly on improving trainees' competence in teaching, research, and/or clinical work vis-à-vis pipeline transition facilitation and success.

Action steps.

#1 Use IDPs across all stages of training. Trainees routinely should review their IDPs with their trainers and use them to guide their honest self-reflection, identify goals linked to their interests, create a plan for acquiring the requisite competencies and experiences, and be receptive to input (Li & Burke, 2010). For example, given that extraversion is a trainee factor associated with positive outcomes, trainees low on this factor may incorporate into their IDP working on goals related to ensuring their comfort with the social demands of being a psychologist, such as engaging in public activities or seeking out teaching opportunities, and attend to the preparation for and feedback associated with such activities. In developing and using IDPs, trainees should assume responsibility in charting their course and seeking resources and experiences in the service of their career decisions and goals. They must seek out and engage in career opportunities that complement their disciplinary training. Trainers must view the IDP review process as an opportunity to provide feedback, serve as a resource, offer referrals for additional resources, facilitate training opportunities, act as a coach and mentor, review trainees' achievements at each stage, and give guidance for subsequent transitions.

Recommendation #3: Capitalize on Opportunities to Advance One's Career

Trainees who are proactive and motivated are likely to pursue opportunities that successfully advance their pipeline transitions (Bair & Haworth, 2004). While trainees are responsible for their progress, such progress also depends on trainers, programs, and a supportive and empowering culture that offers maximal opportunities and guidance.

Action steps.

#1 Use training contracts to facilitate progress toward meeting career goals. Trainees may find valuable documents such as the American Association of Medical Colleges' (AAMC) Postdoctoral Compact (www.aamc.org/initiatives/research/postdoccompact/) at all stages of development in combination with the IDP to enhance the likelihood that they determine and reach their goals. Ideally, such contracts are read and signed by both parties, address each party's responsibilities for ensuring high-quality training and formative and summative assessments focused on pipeline progress, and delineate the interpersonal relationship expectations required for effective communication. While such contracts increasingly are being recommended and utilized (Silet, Asquith, & Fleming, 2010), data need to be collected with regard to their actual effectiveness.

Recommendations and Action Steps: Trainer Level

Recommendation #4: Ensure Competence for Helping Trainees Move Through the Pipeline

There is a dearth of information about identifying, training, and assessing trainer competencies, with the exception of those related to teaching and supervision (American Psychological Association, 2015; Phelps, 2010). Other relevant competencies (e.g., advising, mentoring, assessing competence) are rarely taught systematically (Kaslow et al., 2007). Ensuring such competence requires a commitment to reflective practice and lifelong learning on the part of trainers (Bradbury, Frost, Kilminster, & Zukas, 2010).

Action steps.

#1 Engage in lifelong learning related to trainer competencies. Throughout their careers, trainers should participate actively in professional development activities guided by current thinking related to trainer competencies (Kaslow, Falendar, & Grus, 2012). Doing so requires them to reflect upon the competencies they need to acquire and consider such reflective practice as a learning opportunity, participate in relevant training activities, and be open to feedback from others with regard to the impact of their

behavior on their trainees' learning (Runhaar, Sanders, & Yang, 2010). Attaining and maintaining these competencies should be formally assessed by superiors, colleagues, and trainees. Such evaluations should be linked to promotion and other forms of recognition. Interorganizational groups of experts should identify trainer competencies (e.g., advising, mentoring, teaching, supervising, using technology, managing, leading, advocating, assessing competence) and their essential components related to facilitating trainees' pipeline transitions. These experts also should determine when trainer competencies should be taught and supervised, articulate best practices for developing these competencies, and recommend systematic and valid assessments of these competencies across the professional life cycle.

#2 Utilize training modules for trainer competencies. Training modules should be developed that build upon the work of the previously noted interorganizational group of experts and be available online. They should be created by experts in instructional design and the competency of interest. Trainers should systematically and in an ongoing way update their knowledge, skills, and attitudes related to the full array of trainer competencies. They can utilize ePortfolios to support these trainer development activities (Hoekstra & Crocker, 2015).

Recommendation #5: Offer Training Consistent With Career Paths Contemplated by Trainees

Trainers often prioritize or solely provide training in keeping with their own values (Fuhrmann et al., 2011). This is despite the fact that many graduates enter alternative career pathways (Sauermann & Roach, 2012). While this partially is because of labor market imbalances (e.g., those seeking academic jobs vs. position availability), it also reflects the career preferences of many trainees despite their trainers' expectations (Sauermann & Roach, 2012). To optimally support pipeline transitions, trainers must ensure that attention to career opportunities is integrated into each phase of the education and training life cycle (Fuhrmann et al., 2011).

Action steps.

#1 Create curricula and training experiences based on the career paths trainees are contemplating. To increase the likelihood that trainees receive training that ensures successful pipeline transitions, including securing employment of interest, their insights about their career paths need to be solicited. This input should inform the approach to training and the creation of learning opportunities (Gibbs & Griffin, 2013).

#2 Provide trainees resources about the range of career opportunities. Trainers should make information available that complements the career advice. This can be accomplished by sharing resources, including available books and online materials (American Association for the Advancement of Science, 2015; American Psychological Association, 2011); organizing professional development seminars in which psychologists engaged in diverse career paths meet with trainees and discuss their career trajectories, requisite competencies, and advantages and challenges of their chosen career; and encouraging trainees to participate in career development opportunities offered by their host institutions, funding agency, and/or disciplinary society.

#3 Offer and ensure trainees can access diverse applied opportunities and encourage them to participate. Trainers of both categories of psychology trainees should create developmentally relevant applied training experiences related to teaching, scholarship, and/or practice. Such opportunities support optimal performance in one's first job. Trainers can benefit from having access to information about programs that offer a rich array of applied experiences. Trainers can bolster their mentoring efforts related to supporting trainees in engaging in activities related to emerging career pathways by incorporating strategies from pertinent initiatives and programs (Scaffidi & Berman, 2011).

Recommendations and Action Steps: Program Level

Recommendation #6: Be Truthful in Advertising

Trainees' success in moving through the pipeline depends in part to their access to information about programs' status and nature, infrastructure, culture, and trainee outcomes. In HSP, there are formal recommendations and requirements for transparency about minimal qualifications for program success and outcomes, such as first jobs (American Psychological Association Commission on Accreditation, 2014; Grus et al., 2011; Health Service Psychology Education Collaborative, 2013). Other applied service programs and research basic/applied programs have not been required to publicize such information. Moreover, programs have not been expected to provide data on trainee, trainer, or program factors that support timely and positive pipeline transitions.

Action steps.

#1 Communicate specifics about program status, nature, and infrastructure. Programs should determine what data they will report based on the literature and best practices, compile the data in a clear fashion, and provide accurate and detailed reports in appropriate outlets. As decisions are made nationally about what information should be provided by both categories of psychology programs, programs should adhere to these expectations.

#2 Communicate specifics about trainee outcomes at each pipeline transition. To ensure transparency, programs should disclose the successes and problems at each transition and ultimate outcomes. They should include in-

formation about trainee, trainer, and program variables related to transition outcomes. There should be a national consensus among programs and with the relevant accrediting bodies about the nature and format of the variables to be reported.

#3 Educate applicants about program success and outcomes. Program-level efforts with regard to truth in advertising are only effective if program applicants are well informed. Thus, a related system-level recommendation is that APA and all of the training councils more systematically attend to educating applicants about the meaning and implications of the program-level data.

Recommendation #7: Value Professionalism

Programs' commitment to professionalism impacts trainees' satisfaction and outcomes (Grus & Kaslow, 2014; Hickson, Pichert, Webb, & Gabbe, 2007). Environments that do not actively embrace professionalism are more likely to witness errors, adverse events, and unsafe working conditions (Shapiro, Whittemore, & Tsen, 2014). Professionalism in psychology is contextually and culturally based (Jha, Mclean, Gibbs, & Sandars, 2015) and includes accountability, ethical engagement, self-reflection, professional identification as a psychologist, striving for excellence, humanism, civility, collaboration, collegiality, and social responsibility.

Action steps.

#1 Create a culture of professionalism. Taking a lesson from academic medicine (Christianson, McBride, Vari, Olson, & Wilson, 2007; Fryer-Edwards et al., 2007), programs should determine their values and expectations related to professionalism and how these will be conveyed to and inculcated in all constituency groups, how associated behaviors will be modeled, and feedback mechanisms when lapses of professionalism occur. They must create and utilize policies and procedures; cultivate a safe environment characterized by open and respectful communication including about critical incidents; and reward excellence in this domain. They also should ensure that professionalism is taught in accord with best practices. This requires trainers to be informed about the link between professionalism and successful pipeline transitions, strategies for teaching professionalism at different pipeline stages and in different contexts, ways to identify and address unprofessional behaviors in trainer colleagues and trainees, and reliable and valid assessment of this competence (Grus & Kaslow, 2014; Hickson et al., 2007).

#2 Teach professionalism. Professionalism, which includes scientific and clinical integrity, should be systematically taught and supervised, with attention to the aspects most pertinent for the current and subsequent pipeline phase. Such efforts should incorporate didactics and situational and experiential learning including problem-based learning, include opportunities for self-reflection and discussion, and use diverse instructional strategies (Grus & Kaslow, 2014). These strategies should be deigned to ensure that trainees have knowledge and understanding of professionalism as a competency and demonstrate it consistently (Lester, 2014). Ultimately, the teaching of professionalism at the program level must be informed by data collected nationally with regard to the most effective way to teach professionalism in order to positively impact trainees' navigation of pipeline transitions. While a growing number of professionalism curricula have been developed and professionalism programs have been launched (Grus & Kaslow, 2014; Shapiro et al., 2014), their impact on increasing people's levels of professionalism and supporting their career trajectories remains an empirical question.

#3 Use evaluations of professionalism to inform decisions and changes. Programs should systematically and comprehensively evaluate trainers, trainees, and the program with regard to professionalism and its link to pipeline transitions (Goldie, 2013; Hodges et al., 2011). They can utilize existing measures of professionalism that include observational measures, collated views from others and self, records of incidents of unprofessionalism, simulations, and paper-based tests (Wilkinson, Wade, & Knock, 2009) and/or be involve in developing psychology-specific and/or program-specific measures. The data gleaned from assessments of professionalism should be included in summative feedback to trainers and trainees and used to create and institute action plans that address problems in professionalism on the part of trainers or trainees. Feedback about professionalism concerns at the program level should be addressed collaboratively by administrators, trainers, and trainees and used to guide program reform.

Recommendation #8: Prioritize Mentoring

Effective trainer mentorship is a key factor influencing trainee success (Brill, Balcanoff, Land, Gogarty, & Turner, 2014). More specifically, positive mentoring experiences are linked to career progress and outcomes (Eby, Allen, Evans, Ng, & Dubois, 2008), including developing a professional network, securing grants, publishing papers, and getting promoted (van Balen, van Arensbergen, van der Weijden, & van den Besselaar, 2012). In addition, the availability of mentoring and the quality of the mentoring relationship, along with other factors such as discipline, predicts milestone attainment, which is associated with readiness for pipeline transitions (Creighton, Creighton, & Parks, 2010; Lunsford, 2012). While mentoring in part reflects the qualities of the individual trainer and/or the trainer-trainee fit and thus could be characterized as a trainer level variable, effective mentoring is unlikely to occur if the program's culture does not value trainers who serve as quality

mentors (Sorcinelli & Yun, 2007). Therefore, recommendations regarding mentoring are offered at the program level.

Action steps.

#1 Create and nurture a culture that values and supports mentoring. Programs should establish and/or expand upon their policies and procedures to ensure mentoring is provided to all trainees by implementing formal and informal mentoring programs and that such mentoring is prioritized at key transitions. A team-based approach, that includes trainees, peers, and trainers may be optimal for facilitating trainee success through the pipeline (Brill et al., 2014; Holley & Caldwell, 2012). These programs should attend to mentor–mentee match; this match is associated with greater satisfaction and (Menges, 2016) and thus potentially with pipeline progression. Mentoring evaluations should be included in promotion and tenure decisions (Meagher, Tayloor, Probsfield, & Fleming, 2011). Programs can support quality mentoring by offering funding to offset the time trainers spend with their mentees and by giving awards for effective mentors and productive mentoring relationships (Bartels et al., 2010).

#2 Encourage trainers to enhance their competence in mentoring. Programs should make information available about evidence-based mentoring practices and provide mentor training for early career and established trainers. Such training should address the competencies associated with effective mentoring; teach strategies for forming, structuring, managing, and maintaining mentoring relationships with diverse trainees at different stages of development; highlight mentor traits that facilitate mentees' smooth, timely pipeline progress; and underscore the value of team, peer, and network mentoring for fostering pipeline transitions (Bartels et al., 2010; Griffin et al., 2015; Sorcinelli & Yun, 2007). Training should focus on making available relevant and diverse opportunities such as engaging in collaborative activities; offering encouragement, support, and rewards; being open to mentees' ideas and perspectives; fostering appropriate independence; and focusing on professional development (Burney et al., 2009; Forehand, 2008). There is mounting evidence that mentoring training enhances mentors' competence according to reports from mentors and their trainees (Pfund et al., 2014). However, the impact of this enhanced competence on pipeline progression has yet to be examined.

Recommendations and Action Steps: Systemic Level

Recommendation #9: Attend to and Facilitate Pipeline Transitions

To prepare psychologists for historically traditional pathways (i.e., pathways for people who pursue relatively standard career options, such as work in practice settings, colleges/universities, schools, businesses, and government agencies) and emerging career pathways, it is necessary to rethink the outcomes at each pipeline stage and focus more on training efforts to enhance transitions. While some transitions have received considerable attention, insufficient attention has been paid within psychology to optimizing trainees' movement through the pipeline.

Action steps.

#1 Develop and institute a competency-based training approach that targets successful navigation of pipeline transitions. A competency-based framework applied to both categories of psychology trainees at all stages of the training lifecycle should be developed to target pipeline progress. Such training should incorporate didactic and experiential components, the balance of which will shift based upon phase of training; be creative and innovative; and be responsive to cultural shifts. At the graduate level, programs should assist trainees who experience challenges transitioning into the program. Doctoral programs should develop consensus on the core competencies required for successful transition to the next stage and ultimately to the first job (Bangasser et al., 2016). These competencies (e.g., advocacy) and their essential components (e.g., offering psychological science data to policymakers and the public related to key social policy issues) should be made a priority in the curriculum and diverse experiences to hone these competencies should be offered. (Mallinckrodt, Miles, & Levy, 2014) At the internship level, experiences should be provided related to real-world practice in the current climate and for the foreseeable future (Belar, 2012). At the postdoctoral level, translating competencies to different employment contexts should be emphasized and career mentoring should be available (Ross, Greco-Sanders, & Laudenslager, 2016).

#2 Integrate the capability and competency approaches to optimally equip trainees for the workplace. A capability framework (Stephenson & Yorke, 2012) makes it a priority to provide a context and opportunities for trainees to amass the tools needed to work in myriad contexts, handle unanticipated situations, adapt to the evolving landscape, and manifest high levels of professionalism (Lester, 2014). A capability-informed, competency-based approach can support progression through a branching pipeline (i.e., includes employment beyond traditional positions and branches out into other sectors of the workforce) in maximally flexible ways if trainers and programs actively support trainees efforts to access diverse experiences and trainees' requests to do so are responded to in a timely, respectful, and helpful manner.

#3 Devise systematic plans to facilitate pipeline transitions. The creation of plans to foster pipeline movement should be informed by the literature; data from multisite trials focused on qualifications for program admission

that are linked to successful outcomes; success stories of trainees who moved through the pipeline well, secured employment for which they were trained, and report a high level of satisfaction; information about program practices that facilitate progress and transitions; and histories of psychologists that have had innovative career paths. This information should guide trainee and trainer selection, training, and expectations; program design; and the values prioritized within training cultures. Resources developed based on the previously noted information should be available on electronic media and a specific plan should be established for their dissemination. Trainers, programs, and professional societies should create and offer programming designed to support trainees in becoming independent professionals, advertise the programs widely, and ensure that trainees are offered the opportunity to participate.

#4 Develop and implement systematic plans to address pipeline imbalances. Plans to address imbalances should be devised and used for each pipeline transition. For example, with regard to the transition to the HSP internship given the imbalance, processes should be put into place to carry the recommendations forward that emerged from the "Courageous Conversations" meetings that included representatives from the Council of Chairs of Training Councils (Grus et al., 2011), delineate and implement additional recommendations, and monitor and evaluate progress toward resolving this systemic imbalance. With regard to the transition from postdoctoral training to first job, mechanisms should be established to ensure that postdoctoral training is for a temporary period, with a maximum agreed upon time and milestones that would show progression toward completion of training and movement into a first job (National Academy of Sciences, 2014; Sigma XI & National Postdoctoral Association, 2006). Institution-based postdoctoral offices and postdoctoral associations can assist programs in meeting this goal.

#5 Develop resources for trainees and trainees that facilitate transitions. Websites should be developed that include materials relevant to the broad array of trainees, diversity of programs, and multiplicity of career trajectories. These websites could be populated with psychology-specific IDP tools and Eportfolios; best practices for professional development training; resources about transitions to first job for trainees and trainers; and links from reliable sources that are vetted and provide information related to transitions (e.g., calculators that address debt load and job salaries), job analyses for major occupations, and competency and personality profiles that inform decision-making. Also invaluable would be toolkits related to pipeline transitions that include key documents, applications, and YouTube Videos. Media applications could assist trainees in determining their goodness of fit with psychology and associated career paths. YouTube videos could share stories of trainees' successes and challenges in navigating various pipeline transitions and recommendations for effective passage.

Recommendation #10: Reduce Pipeline Leaking

Myriad trainee, trainer, program, and systemic factors are linked to pipeline transition problems in related disciplines (Ong, Wright, Espinosa, & Orfield, 2011). In contrast, little information is available regarding psychology. Moreover, although programs exist to ameliorate pipeline leakage in other disciplines, little is known about best practices in psychology.

Action steps.

#1 Gather data about factors associated with effective and problematic pipeline transitions in psychology. Systemic and longitudinal analyses should examine trainee, trainer, program, and system factors specific to psychology that impact pipeline transition success. Data also should be gathered about trainees' views on trainer, program, and system factors that facilitated or hindered their pipeline progress. To facilitate date collection (a) upon application to graduate school, each person should be given a unique identifier that tracks their pipeline progress (Bangasser et al., 2016) and (b) a centralized application system should be created and used by all graduate schools and for nonhealth service psychology postdoctoral positions/programs, similar to that which exists for HSP internships and postdoctoral programs. These systems, particularly a centralized application system, need to be implemented in a manner that does not put undue financial responsibilities on trainees. Rather, given the importance of tracking and monitoring, the discipline and the training institutions should share in the financial costs. At present, the centralized application is being subsidized by the APA and the financial costs are being shared by all uses, namely the APA, departments and programs, and applicants.

#2 Enhance pipeline movement for diverse individuals. Trainees from diverse backgrounds often are disproportionately impacted by pipeline challenges (Sowell, Allum, & Okahana, 2015). Future investigations must attend to the differential experiences and career development trajectories based upon gender, race/ethnicity, other forms of marginalization, and their intersectionality (Gibbs et al., 2014; Shaw & Stanton, 2012). Research to determine optimal practices for facilitating pipeline progress for psychology trainees from diverse backgrounds should examine factors found to be relevant in other disciplines as well as potential psychology-specific factors (Ong et al., 2011; Rogers & Molina, 2006; Sowell et al., 2015). Findings should be used to create best practices. In the interim, programs should incorporate strategies that are respectful and address microaggressions (Ong et al., 2011) to ensure that diverse trainees have an optimal climate to support their success. National programs to "patch the pipeline" should be developed, eval-

uated, and disseminated. They can expand upon effective training programs in psychology, such as those supported by APA's Commission on Ethnic Minority Recruitment, Retention and Training in Psychology Task Force, and can benefit from programs developed for science broadly (Ong et al., 2011; Schultz et al., 2011; Sowell et al., 2015).

Recommendation #11: Conduct Workforce Analyses

More systematic, comprehensive, and ongoing workforce analyses can advance our understanding of pipeline transition issues ("Committee to Review", 2014; Rozensky, Grus, Belar, Nelson, & Kohout, 2007). These analyses should incorporate mixed method models and address myriad topics.

Action steps.

#1 Conduct workforce analyses relevant to pipeline blockages and successful passages. These analyses would be most meaningful if individuals are tracked from entry to psychology graduate school throughout their career and if success is redefined to include broader concepts, such as job satisfaction, happiness with the choice of career path, and so forth (Bangasser et al., 2016). Pertinent workforce questions could pertain to attrition, underemployment, and miss-employment; employment characteristics of all psychologists and range of first jobs; similarities in first jobs between trainees and their trainers; and similarities and differences between first jobs and subsequent employment.

#2 Use workforce data to predict emerging career pathways. Analyses should focus on individuals who have pursued emerging career pathways and factors linked to their success. Data should be gathered to determine how many psychologists need to be prepared for historically traditional versus emerging career pathways in the future (Rozensky, 2011). When analyses reveal areas where there will be acute shortages, this information should inform the structure, content, and focus of training programs and opportunities to foster the discipline's capacity to train sufficient numbers of psychologists to fill anticipated gaps. When a growing number of psychologists develop competence related to emerging pathways, disciplinary organizations must engage in advocacy efforts that support these individuals in pursuing such trajectories.

#3 Create an infrastructure that supports cross-organizational collaboration related to workforce data. Successful workforce analyses will entail collaboration across organizations, such as for HSPs, between APA and the Association of State and Provincial Psychology Boards. Such collaborations will facilitate data collection, analysis and interpretation.

Recommendation #12: Highlight and Encourage Emerging Career Pathways

Increased attention is being given to the branching pipeline (Fuhrmann et al., 2011). Individual level factors that account for this are demographics; life circumstances; history of accomplishments; personal values, preferences, interests and passions; and creativity and innovativeness (Gibbs et al., 2014). System-level factors include training to support pursuing diverse career paths, workforce opportunities and job availability, financial considerations, and presence of a system support for such choices (Fuhrmann et al., 2011). The interaction of individual and system variables also influences this process.

Action steps.

#1 Shift the culture to embrace the branching pipeline concept. Nationally, we should move away from dichotomously categorizing outcomes (traditional vs. alternative) to emphasizing optimizing career choices. National rankings and program accreditation should be based less on traditional trainee outcomes (e.g., securing an academic position) and more on the variety of career paths chosen. At the program level, trainers can enhance their trainees' agency related to career advancement by promoting and valuing a range of career alternatives, offering opportunities to engage in diverse work settings, fostering networking with individuals in myriad roles, and providing mentorship that supports trainees in exploring paths of unique interest to them (O'Meara et al., 2014). National and local awards can be given to trainers or programs that implement best practices for facilitating trainees' pursuing various pipeline branches, including creating new ones.

#2 Publicize information about emerging pathways. Profiles of individuals who have pursued emerging pathways should be publicized to inform and inspire trainees and other psychologists. The *APA Monitor* has a frequent feature entitled "How did you get that job?" *GradPsych Magazine* (2014) in "The roads less traveled" focused on a psychology advocate, video game researcher, toy researcher, National Transportation Safety Board member, psychology consultant, environmental designer, science advisor, pilot trainer, and National Aeronautics and Space Administration Researcher. The APA Science Directorate highlights careers for psychological scientists beyond traditional academic positions. This information should be expanded, publicized more widely, and offered in multiple formats (e.g., webcasts with standardized interviews) so interested parties can learn about a range of options and the competencies integral to securing such positions.

Concluding Comments

For psychology to thrive and best serve the public, we need a well-prepared workforce comprised of individuals with the competence and capability to assume diverse roles

and responsibilities as they transition to their first job. Fortunately, many trainers and training programs have embraced many of the aforementioned recommendations already. Unfortunately, however, traditionally we have prepared trainees for the careers their trainers engaged in, underprepared them for their first job, or failed to expose them to the branching pipeline. In addition, pipeline transitions have not been the focus of our education and training models. This lack of systematic facilitation of pipeline movement from doctoral education to the first job combined with multiple persistent pipeline challenges in psychology is associated with negative consequences, such as pipeline leaks, blockages, and limited branches. To redress this state of affairs, it is essential to consider both health service/other applied service and research basic/applied psychologists when conceptualizing and addressing the different levels of the ecology (trainee, trainer, program, system) that impact pipeline transitions. Too often, psychology has focused on the differences between these two categories and not appreciated the fundamental commonalties. In addition, it behooves psychology to embrace individuals trained as psychologists who identify with other disciplines (e.g., neuroscientists, behavioral economists) and rather than view them as people who "leaked from the pipeline," highlight them as examples of innovative and novel discipline realignments. Doing so not only widens psychology's tent, but will also serve to expand the public's perception of psychology's breadth and impact.

It is imperative that the education and training culture recommits to the progress, creativity, and flourishing of trainees. At a program level, this can mean implementing programs that show promise with regard to reducing trainees' levels of stress and burn-out, which likely enhance their performance and progress (Smith et al., 2006; Williams, Tricomi, Gupta, & Janise, 2015). The value of these programs in facilitating pipeline transitions must be determined. At a systems level, this requires acknowledging the problematic aspects of the pipeline and engaging in coordinated efforts to fix infrastructure and cultural challenges. It demands that workforce data be collected and the resultant findings be used to assist trainees vulnerable to pipeline difficulties and to prepare trainees for the diverse workplace based on employment patterns and trends. It calls for national expectations for trainers to target individualized career planning and professional development that fosters trainees' exploration and progress toward the branching career pipeline (Fuhrmann et al., 2011).

It also requires that our education and training endeavors are guided by an understanding of the forces that shape the present and future of psychology. This will lead to a modification of our training cultures and activities so there is greater emphasis on preparing people for careers beyond those that currently exist. Doing so will entail a move beyond competency-based training to capability-focused training (Stephenson & Yorke, 2012). It will involve trainers encouraging trainees to explore and prepare for alternative pathways based upon their strengths, passions, and practical realities. This enhanced emphasis on capability and active preparation for the branching pipeline likely will result in trainees having greater success, being more satisfied and fulfilled, and making a more significant impact when they attain their first job and beyond.

This article outlined a series of recommendations and associated action steps. Some of the action steps are more feasible and realistic to pursue at the present time, whereas others will require considerable work (e.g., developing best practices for training trainers in mentorship) and study before they can be implemented. We are cognizant of the fact that there is a paucity of empirical data to support these proposals. We hope this article encourages the implementation of our recommendations and lays the groundwork for a systematic empirical examination of their effectiveness in supporting pipeline progress. Such data should inform which practices should be eliminated, which deserve modification, and which should become best practices.

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