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Accelerating Research Productivity in Social Work Programs: Perspectives on NIH's Postdoctoral T32 Research Training Mechanism

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Abstract

This article describes the experiences of four social work researchers who pursued an alternative career path immediately following their doctorate in social work by accepting a postdoctoral training fellowship funded by the National Institutes of Health (NIH). As schools of social work look for creative ways to build research capacity, this article describes the authors' perspectives regarding the considerations to accept postdocs, key elements in their training programs, lessons learned, and outcomes from training. To provide an overview of the funding mechanism and distribution of funds to institutes and centers relevant to social work, data were obtained from databases that list NIH training grants awarded each year. Study results showed a limited amount of variation in fellows' training plans. The majority of training time was spent building skill in manuscript preparation, grant development, and socialization to the NIH culture. Above all other themes, the desire for advanced research training was a critically important factor in accepting a postdoctoral training position. Finally, the outcomes of training may have a profound effect on professional development, yet the long-term trajectory of postdoctoral fellows in academic positions as compared with people without postdoctoral training in social work programs requires further study.

Keywords

postdoctoral research training; research; research capacity; social work

As social work faculty strives for increasingly competitive external funding from sources such as the National Institutes of Health (NIH), the need for mechanisms that support

increased skill development in research methods and grant writing is of paramount importance. Though frequently used in other disciplines to protect time for new researchers to build these skills and develop their independent research (Ackerlind, 2005), postdoctoral training is rarely exploited by graduates of social work doctoral programs and schools of social work (Austin, 1999). In the context of continued high demand for social work faculty, the benefits of postdoctoral training may seem superfluous, making the extra investment in advanced research training unattractive (Kupfer, Hyman, Schatzberg, Pincus, & Reynolds, 2002). This article introduces the reader to postdoctoral training as a mechanism for building research capacity in social work, suggests some points for consideration when weighing the costs and benefits of postdoctoral training (drawing from our experiences with postdoctoral training), and describes databases that provide an overview of the federal investment in postdoctoral training grants.

There are two primary funding sources for postdoctoral research training: private foundations and federal funds awarded to institutions by NIH. Private foundations typically focus on specific content areas (for example, the American Foundation for Suicide Prevention) or disciplines (for example, the Hartford Foundation), whereas NIH-supported federal funding typically focuses on the public health issues central to the mission of the named institute (for example, the National Institute of Aging and the National Cancer Institute). Although training programs, missions, and funding sources may differ, postdoctoral training essentially offers time for advanced research training. The Ruth L. Kirschstein National Research Service Award (NRSA) research training grants provide the primary support for NIH-funded pre- and postdoctoral training (for a description of the NRSA, see <http://grants.nih.gov/training/nrsa.htm>). As of August 2007, the NIH Office of Extramural Research reported that in fiscal year (FY) 2006 the total award amount, that is, total expenditures not including administrative supplements, for NRSA T32 grants was \$560,609,687 (NIH, 2007). This article focuses on NIH's T32 training grant, which provides funding to eligible institutions that then select the individuals to participate in the training program.

Method

We were in the unique position of participating in postdoctoral fellowships in two environments: a school of social work and a medical school department of psychiatry. This comparative approach provides us an opportunity to build on our perspectives to develop a set of recommendations for improving the research infrastructure within schools of social work. Before describing the elements of and lessons learned from postdoctoral training, we will review data obtained from two databases that list NIH training grants awarded each year (one for all NIH-funded investigators and one specific to social work research).

Computer Retrieval of Information on Scientific Projects (CRISP) Search Criteria

CRISP (<http://www.crisp.cit.nih.gov>) is a database of federally funded biomedical research projects supported by the U.S. Department of Health and Human Services and maintained by the Office of Extramural Research at NIH. To identify training grants awarded over the past three FYs, the search strategy for this article included entering the key words for FY

(2005, 2006, 2007), one activity (Trainee), and all NIH institutes and centers (ALL) listed in the database. A cumulative number of grants for each year was determined; all three FYs combined were calculated for each institute and center by adding the totals for each year. In addition, FY 2006 was selected for in-depth examination because of the availability of data on the total expenditures for all training grants funded by NIH for the activity denoted Trainee (T). Note that within the CRISP database, the trainee activity category is not restricted to postdoctoral training, therefore T grants include undergraduate-, master's-, and postdoctoral-level training grants. In addition, some institutes and centers use numbers other than T32 to indicate trainee activities (that is, the Centers for Disease Control and Prevention uses T01, T02, and T42); all training grants retrieved by CRISP, regardless of the number, were included in this analysis.

IASWR Directory Search Criteria

Despite the ease of searching in CRISP, data on the principal investigators' (PI) affiliation respective to a specific school within the sponsoring academic institution is variable. Many of the training grants retrieved from the CRISP search did not list the school in the public abstract. Therefore, to obtain a perspective on the number of training grants awarded to faculty within schools of social work, the 1993 to 2006 updated directory (Institute for the Advancement of Social Work Research [IASWR], 2007) prepared by IASWR was reviewed. This directory provides a listing of grants awarded to PIs who were social work researchers or faculty working in accredited social work education programs (IASWR, 2005). IASWR requested lists from various NIH institutes, merged the lists with informal requests for information from individual investigators, and performed publication searches for funded investigators. Search criteria included grants that had "T" in the grant number or the word "training" in the grant name.

Perspectives on Postdoctoral Training

Initially, two of us (one trained from each site) compared the two training sites (one social work, one medical school). We identified the key elements in our training programs and our perspectives derived from participating in postdoctoral research training programs. We iteratively revised these elements through review and discussion among all of the authors. We organized the list into the following four categories: (1) elements of the postdoctoral training program, (2) lessons learned during the postdoctoral experience, (3) factors that weighed into our selection of and decision to pursue a postdoc, and (4) our perspective on the outcomes of postdoctoral training.

Results

Scope of the NIH Investment in Funding Training Grants

In each FY from 2005 to 2007, 34 NIH institutes and centers administered training grants, as indicated by our review of the CRISP database, and eight did not. In 2007, 26 institutes and centers reported funding 2,534 T grants; in 2006, 25 institutes and centers reported funding 2,370 T grants; and, in 2005, 25 institutes and centers funded 2,381 T grants. To more fully examine the distribution of NIH's investment in training grants and, in particular, to determine the number of training grants funded within institutes that may be relevant to

social work research, we organized the results of funded T grants in 2006 by institute or center (see Figure 1).

Number of Social Work Researchers Funded with Training Grants

Of the 39 PIs with training grants listed in the IASWR directory from 1993 to 2006, the largest percentage (69.23%; $n = 27$) were T32s, a smaller percentage (17.95%; $n = 7$) were T34s, and 12.82% ($n = 5$) listed as other; all of these were funded by only eight different institutes and centers. Of the total PIs with T grant funding ($n = 34$), the vast majority listed completion dates of the grants prior to 2006; only a few ($n = 13$) PIs were reported to have current funding as of 2006, and, of these, only two institutes (National Institute of Mental Health [NIMH] and National Institute on Drug Abuse) funded these postdoctoral training programs.

Perspectives on the Postdoctoral Research Training Experience

Our discussion resulted in six key elements of our postdoctoral research training experience: the research environment, mentorship, seminars and meetings, coursework, collaboration and networking, and research experience (see Table 1). On the basis of ranking, mentorship and the research experience were the two most important elements; the research environment consisting of the space, technology, and access to data sets and a proven track record of recruitment in clinical or community populations of interest also are critical. In addition, the need for a critical mass of research-trained investigators who currently have or are actively in the process of seeking external funding is paramount for both potential trainees who may want to do a postdoc and institutions wishing to develop a postdoctoral research training program.

Results also yielded three key learning themes that define the postdoctoral experience: the transmission of the NIH culture, the expectation of research productivity, and the development of independent research. Finally, our review focused on considerations in weighing the costs and benefits of engaging in postdoctoral training at two points: before decision making and at two to three years after receipt of the doctorate (see Table 2). The desire to pursue advanced research training was the overarching theme in accepting a postdoc as compared with the financial, personal, and professional reasons for accepting a teaching rank faculty position immediately following the doctorate. In terms of outcomes, results indicate that advanced research training provides a strong foundation and a set of tangible skills and products for going into faculty positions, whereas we believe that new faculty without postdoctoral training may be trying to obtain those benefits during the initial years of a tenure track faculty position amid teaching and other duties.

Discussion

In our experience, the desire to pursue an externally funded independent research career is a compelling reason to engage in advanced research training via a postdoctoral training program in the context of an increasingly competitive funding environment. The CRISP data presented in this article and other historical overviews on training mechanisms provide some insight as to the broad investment by NIH across institutes and centers, whereas the IASWR

data clearly underscore the relatively small amount of currently funded NIH training grants awarded to social workers. Unfortunately, the opportunity to participate in NIH-funded postdoctoral training is constrained by the small number of currently available positions. We believe that strategies are needed to develop more opportunities for postdoctoral training specific to social work so that the field may be better positioned to compete for precious resources and advance social work research. With the overwhelming focus on NIMH, other institutes and centers may represent untapped sources for funding postdoctoral training programs within schools of social work.

Perspectives on the Key Elements in Postdoctoral Training Programs

Mentorship—On the basis of our list, the highest rated element of our postdoctoral training programs was mentorship and research experience; however, all six elements were interwoven into our training programs in the medical and social work schools we attended. Both formal and informal mentorship are critically important to the career development of researchers and are integral in postdoctoral research training. Our review indicated that, in selecting a mentor, the most desirable qualification from the perspective of the postdoc is for their mentor to have current or previous external funding, preferably NIH funding. The opportunity to learn not only content, but also the process of becoming a grant-funded investigator from an experienced NIH-funded faculty member cannot be overstated in its value to postdocs.

Mentored Research Experience—As a group, we valued working on mentored research projects that have been developed and shaped by an experienced investigator. For many postdocs, working with a particular mentor is one reason for accepting a postdoctoral training position. This apprenticing model includes networking with senior investigators, building on the mentors' line of research, receiving feedback on research methods and publications, and learning from the decision-making and problem-solving process used by mentors. However, there can be disadvantages in working exclusively on mentored research projects without the simultaneous development of a particular niche. Over time, alignment with a mentor's area of research can be problematic; when too similar, grant reviewers have a difficult time distinguishing the postdoc's research from the mentors research.

Independent Research Project—Our review determined that one way to ensure that the postdoc is developing ideas for his or her own line of research is the use of regular scheduled meetings with mentors that are exclusively and actively focused on the individual's training goals. With only two or three years of training, training goals should be clearly articulated in a career development plan that can likely lead to publications, pilot data collection, and grants. An additional project that provides long-term benefit to trainees is a scientific autobiography, which traces the development of the trainees' research area of interest evolving from their clinical experience, previous research projects, or influential life experience. Relating these initial projects to the longer-term training outcomes (that is, a scientific autobiography is necessary for the development of an NIH loan repayment program or K award application) allows mentors to emphasize the need for postdocs to focus attention and concentrated scholarship in developing an area of independent research.

Key Learning Themes from the Postdoctoral Training Experience

Three key learning themes evolved from our postdoctoral training experiences: (1) the transmission of the NIH culture of research, (2) the expectation of research productivity, and (3) the development of a focused research portfolio. The transmission of the NIH culture includes knowledge of the priorities for the particular NIH institutes and centers; the ability to read and interpret grant announcements and mechanisms; experience in interacting with NIH project officers; and skill in integrating federal policies, scientific reports, and current NIH priorities into grant proposals for maximum impact. A second theme is the development of a personal culture for research productivity. Tangible products such as published manuscripts, internal or external research funding, and development of proposals for future submission are some of the markers of trainee productivity.

A final theme in our postdoctoral training is the expectation for and beginning development of a focused independent research portfolio. An initial step can be the preparation of the dissertation for publication. For many scientific disciplines, the postdoc period is the time to publish manuscripts born out of the dissertation. Beyond this first step in developing a focused line of research, aspects to consider are the judicious selection of topics for manuscript development, development of manuscripts that fit a set of interrelated themes, and coauthorship with postdoctoral mentors and leaders in the field. It is necessary to publish a coherent line of interrelated research to support efforts to secure funding for research work early in one's career. Later, this focused trajectory of research will be evaluated as part of the tenure review process.

Weighing the Decision

The rationale for our selecting postdoctoral training included the desire to devote time to increase the quantity and quality of publications, develop grant writing skills, develop a new or expanded research area, and assess career goals. For those who choose the faculty track immediately after receipt of the doctorate, the financial burden, geographic preferences, pressures to join the teaching ranks, lack of mobility, or desire to move beyond the trainee role may be major considerations. The benefits of a postdoc may seem more advantageous to those who want to pursue external funding as part of their faculty position. The up-front investment in postdoctoral training can provide the protected time to launch research and develop the skills to “bridge” between graduate education and independent investigator status or career development award (for example, K award) support.

Outcomes of Postdoctoral Training Experience

Even though there was similarity across our experiences in the postdoctoral training programs, there is some variability in outcomes we perceive as directly resulting from our postdocs. Although time to first R01 type grant and the strength of the publication record are outcomes of interest for NIH (Mantovani, Look, & Wuerker, 2006), other outcomes may be overlooked as the building blocks for a research career in today's competitive funding environment. For two of us, the submissions of NIH R03s were tangible outcomes of our postdoc, whereas another one of us opted for the submission of a career development award and the other, inclusion in NIMH-funded randomized controlled trial. All of us have successfully attained awards from NIH's loan repayment program (www.lrp.nih.gov),

informally considered the “mini-K.” In addition, networking resulted in lesser known outcomes, such as acceptance in R25 mentoring programs and subcontracts. For all of us, the faculty appointments at schools of social work where advanced research training was seen as “value added” are one of the most valuable returns on our investment.

How to Locate a Postdoc

Unfortunately, there is no single source for the identification of postdoctoral training programs available to social workers. Even if a single source existed to identify postdoctoral training opportunities, we attest that attitudes about postdoctoral training within social work doctoral education need attention. “Why do a postdoc when there are faculty positions available” is a common question. France and Wolf (2000) recommended that the value of postdoctoral training be articulated in professional development seminars or similar venues. We believe that our profession must demonstrate a commitment to advanced training by rewarding the perseverance of trainees by putting a monetary value to this experience when negotiating salaries. Without this recognition, postdoctoral training will continue to be marginalized at the expense of the long-term retention of highly trained social work researchers and the added research capacity and infrastructure within our schools.

Limitations

A survey of the postdoctoral awardees would have provided a more systematic review on the topic, but this article, although exploratory and limited to the personal NIH postdoctoral training experiences of four individuals, suggests a need for future research. There are, without a doubt, other funding sources for postdoctoral training that could support the development of enhanced social work research capacity. Despite these limitations, we believe our experiences and outcomes were diverse enough to warrant this initial discussion, particularly given the lack of prior attention to the topic of postdoctoral training in social work.

Conclusion

Despite the up-front investment, postdoctoral training can confer tremendous benefits to researchers and can support efforts to build research capacity and infrastructure in social work. The postdoc is one mechanism to gain the skills and experience necessary to compete for highly competitive federal funding. Schools of social work need to increase the quality of and access to postdoctoral opportunities and place value on this advanced training.

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Figure 1. Number of NIH Training (T) Grants Funded in 2006 ($N = 2,370$), by Institute According to CRISP

Table 1
Perspectives on the Key Elements Found in Postdoctoral Training Programs

Research Environment	Collaboration and Networking
<ul style="list-style-type: none"> Physical space and technology School resources (for example, library, courses, data management tools) Support staff (for example, grant support, statistics and methods consultation) Critical mass of experienced and currently funded investigators 	<ul style="list-style-type: none"> Conference travel support National Institutes of Health (NIH) conferences and meetings Interdisciplinary meetings: internal and out of department; NIH funded Introduction to and contact with NIH Program Officers
Mentorship	Seminars and meetings
<ul style="list-style-type: none"> Formal: internal, routine, scheduled, and include other department faculty Informal: dean or chair, senior faculty, and network of externally funded researchers and research teams 	<ul style="list-style-type: none"> Statistics and methods seminars, grand rounds, invited lectures Trainee meetings: journal clubs, grant and manuscript development and reviews by senior faculty
Coursework	Research experience
<ul style="list-style-type: none"> Additional degrees (for example, MPH) Substantive and other coursework in and out of department Research training in ethics, grant and manuscript writing Advanced methods and statistics 	<ul style="list-style-type: none"> Institutional review board, statistics and methods experience Work on funded projects (for example, Co-I and project management roles) Grant and manuscript development (writing sections and your own grants) Independent research projects

Table 2
Considerations Before and as Outcome of Postdoctoral Training versus Faculty Position

To do a postdoc	To not do a postdoc
<ul style="list-style-type: none"> • Few publications – need dedicated and protected time for publishing dissertation, coauthored papers, etc. • Limited grant writing experience – want mentorship and collaborative team-based learning on the process of grant development and submission. • Desire to build a niche of specialized expertise that requires additional training, mentorship, and funding. • Want to be socialized to culture of NIH and develop research career trajectory. • Want to increase goodness of fit as job candidate at Research I universities. 	<ul style="list-style-type: none"> • Debt load requires that first job after PhD has a salary higher than the current federal postdoctoral training stipend. • Want to move beyond the student or trainee role; want to acquire professional role as assistant professor at school of social work or other academic department. • Feel that the postdoc will not translate to more money or a better job upon completion 2 to 3 years later. • Not sure that you want to pursue NIH- funded research career track. • Have job search catered to specific geographic preferences, schools, etc.
After 2 to 3 years as postdoc	After 2 to 3 years as faculty
<ul style="list-style-type: none"> • Back on the job market • More knowledgeable and possibly more selective in job search for research capacity within the school that could support and sustain externally funded research for new investigators • May consider position as a research assistant professor or research scientist as alternative to joining teaching ranks. • Time devoted to research may have produced a track record with experience on mentored research projects, publications, and grants. • Clearly articulated career trajectory of research; experience writing scientific autobiography, career goals, etc. in the development of NIH Loan Repayment Program or NIH Career Award (K). • Mentorship, training, consultation, and peer review in the development of independent research project toward appropriate NIH funding mechanism. • Experience identifying and using expert mentors and consultants in development of research grants. • Research line is established going into assistant professor position without pressure of tenure clock. 	<ul style="list-style-type: none"> • Settled into new job and role as professor. • School may lack the research capacity (knowledge, skill, experience, resources, or environment) to support and sustain externally funded research for new investigators. • Want tenure track job that has a more balanced combination of research, teaching, and community service. • Demands on time devoted to research – heavy committee or teaching loads may delay or impede research start up and development of independent research. • Academic development plan may be requirement as part of third-year tenure review; may be unfamiliar with or first time to write this type of career planning document. • May need to invest additional time and resources to attend grant writing and NIH technical assistance workshops to learn about NIH funding mechanisms. • May need to find expertise for peer review of grants and others to assist in the development of research grants. • Research line is developing at the same time as the tenure clock is ticking.