

**An Exploration into Questionnaire Design Issues:  
Focus Groups with U.S.-Degreed and Foreign-Degreed  
Postdocs**



**Prepared by**

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## Key Findings

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The Survey Sciences Group, LLC (SSG) conducted four focus groups with postdocs in the Southeast Michigan area as part of the postdoc questionnaire development task on the Postdoc Data Project (PDP). The focus groups took place during the second week in August, 2008, and consisted of two groups of foreign-degreed postdocs and two groups of U.S.-degreed postdocs. The purpose of the focus groups was to obtain information that would (a) help prioritize questionnaire topics that are not already addressed in National Science Foundation (NSF) Science Resources Statistics (SRS) ongoing surveys and (b) inform best approaches to question wording and questionnaire design.

Highlights of the findings were:

1. Focus group participants were asked about the topics they would like to see included in a national study of postdocs. They selected “transitions from the postdoc position to permanent employment” and “opportunities within the postdoc position” as their top choices, followed by “funding support” and “balance of advisor needs with career development needs”. U.S.-degreed and foreign-degreed postdocs were largely similar in their ratings of the topics. The selected topics reflected those noted as important for a postdoc survey in the workshops and focus groups conducted in Phase 1 of the PDP. The SRS Postdoc Advisory Committee felt that the transition to a permanent position was a priority topic to measure, but did not select the other topics as high priorities.
2. Can postdocs describe a “successful postdoc appointment” and if so, what is important? The focus group participants almost unanimously declared it was a very easy task to rate items that they considered important to a successful postdoc. Publishing papers and obtaining a permanent job following the postdoc were selected as the most important activities; creating marketable products or applying for patents were generally considered least important, mainly because the majority of the groups were considering academia for a permanent job.
3. Career interests appeared to influence which items were put at the top of the list for a successful postdoc. For example, several of the participants explained that they would need a different skill set in industry versus academia: obtaining grants was more important for academic careers while supervising others more important for industry careers. Postdocs interested in pursuing a career in a liberal arts college (as opposed to a large, research institution) rated teaching experience highly. Postdocs who had switched fields tended to rate “increasing subject matter knowledge” very highly.
4. There was significant heterogeneity in terminology used for the postdoc’s supervisor: the participants used the terms *boss*, *PI*, *mentor*, and *advisor* – regardless of the terminology, participants appeared to understand to whom was being referred.
5. Are postdocs knowledgeable about how their positions are funded? Nearly all participants across both U.S. and foreign-degreed groups confidently described their primary source of funding. In some situations, funding was awarded directly to the PI; in other situations, the funding was awarded to the lab or center. It was not uncommon for funding to come from more than one source but rarely more than two sources. Differences in knowledge about funding did not emerge between foreign-degreed and U.S. degreed postdocs.
6. Some differences emerged between U.S.-degreed and foreign-degreed postdocs in their motivations to take a postdoc appointment. Response options to a survey question about motivations for pursuing a postdoc should cast a broad net in order to fully understand the reasons among a diverse

postdoc population. Many focus group participants were attracted to an individual principal investigator (PI) and/or a lab, based on the PI's or the lab's prestige and funding history. Foreign-degreed postdocs more often expressed networking at conferences or through colleagues as a method for obtaining their postdoc than did U.S.-degreed postdocs. Foreign-degreed postdocs additionally expressed that a U.S.-based postdoc was particularly important in expanding academic opportunities in their home country and allowing them to improve their English language skills. On a couple of occasions, foreign-degreed postdocs expressed choosing a postdoc in academia because it was easier to obtain a visa for such position over a postdoc in industry.

7. Both U.S.-degreed and foreign-degreed postdocs reported that gathering data and writing up the findings for publication were their primary responsibilities. Some assisted with grant writing.
8. There was variation in the degree of autonomy among postdocs generally. Some postdocs spend most—or all—of their time advancing their principal investigator's research while others are given broad direction and are then responsible for executing projects. A few have autonomy to concentrate solely on their own research agendas. While many have flexible work schedules, frequently the responsibilities and goals of their position require work weeks that far exceed 40 hours. We did not observe notable differences in work schedules between U.S.-degreed and foreign-degreed postdocs.
9. Few participants began their postdoc with a formal plan describing the expectations and responsibilities of their position, and felt that the lack of orientation in general was a disadvantage to new postdocs. Foreign-degreed postdocs usually had a letter sent by the PI with an outline of a plan for obtaining a visa, but no details on the day-to-day aspects of the position.
10. There was a definite sentiment that postdocs “feel through the cracks” in terms of having an orientation to their department which contrasted with their PhD experience. Survey questions about orientation to the position specifically, and the work environment generally would be helpful in understanding how the training environment affects transitions to a permanent position.
11. Postdocs indicated that mentors could have an enormously positive impact on the postdoc experience. Their mentoring relationships vary widely in terms closeness, amount of interaction and degree of support for career development. Many postdocs utilized additional resources including peers and former mentors (PhD advisors) for career guidance and support.
12. Intense competition was anticipated (or has already been experienced) for both industry and academic sector jobs, but most postdocs preferred to transition to permanent employment rather than seek an additional postdoc position.
13. A common theme in discussing permanent position desires was work-life balance: participants' experiences during their postdocs and observations of their often overextended but successful PIs highlighted their needs consider how they would balance both family and work.

# **An Exploration into Questionnaire Design Issues: Focus Groups with U.S.-Degreed and Foreign-Degreed Postdocs**

## **Introduction**

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The Survey Sciences Group, LLC (SSG) conducted four focus groups with postdocs in the Southeast Michigan area as part of the postdoc questionnaire development task. The focus groups took place during the second week in August, 2008, and consisted of two groups of foreign-degreed postdocs and two groups of U.S.-degreed postdocs. The purpose of the focus groups was to obtain information that would (a) help prioritize questionnaire topics that are not already addressed in the National Science Foundation (NSF) Science Resources Statistics (SRS) ongoing surveys and (b) inform best approaches to question wording and questionnaire design. More specifically, the focus groups were intended to:

- Select concepts considered important to measure in a postdoc study from a list developed from earlier background research on the Postdoc Data Project;
- Understand professional and personal motivations for taking a postdoc appointment;
- Identify perceptions and expectations of a “successful postdoc” and whether such a concept could be measured;
- Understand the range of mentoring relationships; and
- Gather feedback on how to obtain data / ask questions about the topics described above.

The first section below describes the methodology of the study. The next sections highlight key findings from each of the main sections of the interview guide: motivations to take a postdoc; factors that make a postdoc successful; mentoring; key concepts of importance to postdocs; and future plans.

Please note: this was a qualitative study and thus it cannot be assumed that the experiences, views and opinions of these participants are broadly representative of postdoctoral researchers nationwide. All italicized comments are quotations from group participants.

## ***Methodology and Objectives***

SSG conducted four focus groups on Tuesday, August 12 and Wednesday, August 13, 2008. Two groups were conducted with individuals (referred to as “postdocs” and “participants” in this report) who received their PhDs from non-U.S. institutions and two were with those who had received their PhDs from U.S. institutions (“foreign” and “domestic-degreed”). There were between 8-9 participants in each group.

Participants were recruited from institutions in the Southeast Michigan area already known to employ both foreign and U.S. degreed postdocs. We selected Southeast Michigan to increase efficiency in the conduct of the groups given that SSG (the PDP contractor) is located in this area. Sources of recruitment included the SSG Participant Database and extensive outreach efforts to departments across disciplines at the University of Michigan, as well as Wayne State University and Eastern Michigan University. SSG made further contacts outside academia from the Southeast Michigan (SEMI) site visits conducted in the fall of 2007. The SEMI site visit contacts, however, did not result in any recruits for the focus groups.

Participants were screened to identify their degree-granting institution, field of research, and (if foreign-degreed) their country of citizenship, visa type and length of stay in the U.S. A copy of the telephone screener is in Appendix A.

The groups averaged approximately 110 minutes in length. All participants received incentive payments of \$50. The groups were audio- and videotaped. All participants signed a consent form prior to participating in the groups. A copy of the discussion guide is in Appendix B.

Overall, there were 34 participants in the focus groups: 17 in the U.S. degreed groups, and 17 in the foreign-degreed groups. In the foreign-degreed groups, there were 10 male and seven female participants. Postdocs in both foreign-degreed groups held PhDs in a number of fields: eight postdocs held PhDs in the biological sciences, four in the health sciences, two in the physical sciences, three in engineering, and one in agricultural science.

The foreign-degreed participants represented many parts of the world, including five who obtained a PhD from China, seven from Europe, two from India, two from Canada, and one from Australia. Interestingly, several postdocs held citizenship in one country, but obtained their terminal degree in another. Four postdocs had been in the U.S. for less than two years, six for between two and five years, and two for 5-10 years. Five participants declined to respond to this question in the screening interview.

In the U.S.-degreed groups, there were six male and 11 female participants. All of the postdocs in the U.S.-degreed groups held PhDs (with exception of one who had an MD) in a number of fields: five postdocs held PhDs in the biological sciences, three in the health sciences, four in the physical sciences, and five in engineering.

Table 1 below provides a summary of the characteristics of participating postdocs. Appendix C provides a detailed summary of characteristics by group.

**Table 1. Sex and Field of Study among Foreign-Degreed and U.S.-Degreed Postdocs**

	<b>Foreign-Degreed</b>	<b>U.S.-Degreed</b>
<b><i>Sex of Participant</i></b>		
Male	10	6
Female	7	11
<b><i>Field of Study</i></b>		
Biology	8	5
Health Science	4	3
Physical Sciences	2	4
Engineering	3	5
Agricultural Sciences	1	0

## **Professional and Personal Motivations for Taking a Postdoc**

At the outset of the group discussions, each participant described why they choose a postdoc at this time in their career, the length of time and events (if any) in between obtaining their doctorate degree and starting a postdoc. They also provided information about the funding for, and compensation from, their current position and current responsibilities and hours.

### ***Timing of the Postdoc***

Most participants went directly from completing their PhDs to the postdoc position, with perhaps a short amount (a few months) of personal or vacation time beforehand. Choice of postdoc depended on several factors including the perceived likelihood of publications resulting from the postdoc and the prestige of the PI. Foreign-degreed postdocs indicated some limitations on positions for which they could apply.

*I took a couple of months off...just to take some time off I decided I needed a break. Domestic-degreed Participant*

*I came here very quickly just after I earn[ed my] PhD. Foreign-degreed Participant*

*My PH.D was turned in I think Tuesday and then I missed a meeting on Tuesday that my postdoc advisor set up. Domestic-degreed Participant*

### ***Motivations***

Nearly all (foreign- and U.S.-degreed) postdocs felt their postdoc experience (and publications from their postdoc) was essential to obtaining a permanent position. This sentiment was especially true for those planning to pursue an academic career.

*For me, for instance, if I would like to have a position in academia [in my country]. This is very important to have a postdoc here, [to] have experience. As many years as you are here, it's better going back. Foreign-degreed Participant*

*I wanted a grant ... good points on my CV... it will be helpful for me in the future. Foreign-degreed Participant*

*Postdocs in my field... you have to do this to stay in academia, to get a position. Domestic-degreed Participant*

*I...see myself staying in academia, so obviously a postdoc is a requirement. Although I have to say, it sounds like I'm echoing some of what the other people are saying that I'm beginning to have doubts. I don't know whether I want to stay in academics or not. Domestic-degreed Participant*

*I actually applied for quite a number of industry positions straight out of grad school. I never heard a single word back, which was a little bit alarming, whereas the two main academic positions that I was applying for I heard back almost immediately. Domestic-degreed Participant*

The two major reasons for taking a postdoc were the opportunity to work with a particular Principal Investigator (PI), or that the subject matter being studied aligned with the participant's research interests. The attraction of specific PIs and their labs was a main motivation across degree groups.

More foreign-degreed participants seemed to be attracted to working with particular researchers (PIs or research groups) than U.S.-degreed participants. There also seemed to be a tendency for foreign-degreed participants to mention networking at conferences or through colleagues as a method of obtaining their postdoc.

A few postdocs across foreign-degreed and U.S. degreed groups had taken the postdoc to gain experience outside of their area of expertise or PhD thesis subject.

Several participants indicated they were accompanying a spouse or partner who was taking a position (that is, their spouse or partner had first secured a position and they then sought a postdoc at the same institution to avoid separation).

Several foreign-degreed postdocs indicated that improving their English-language skills was a primary motivation. For foreign-degreed postdocs, international experience, specifically U.S. experience (and publications), was necessary to secure a position in their home countries.

*I came here because ... my current boss [is] a top-level expert in his field ... During my PhD, I read quite a lot of papers [by] him. Foreign-degreed Participant*

*The reason I ended up in my current lab is because I actually met my PI at a number of international conferences during my PhD and he offered me a postdoc about eighteen months before I graduated. And he was actually at [a different university,] but he moved here so I came here. I followed him rather than the institution but now I'm glad I'm here because it's a good point to have on my CV. Foreign-degreed Participant*

*I had a number of offers, and I ended up choosing here because I knew the guy that I'd be working under. I've worked with him some on the side as a grad student, and I liked the work that he was doing. It was actually in parallel with my dissertation, so that's why I ended up choosing to come here. It's a comfortable environment, work-wise. Domestic-degreed Participant*

*I also interviewed many labs before joining here, and basically I wanted a lab where I can get good publications in a short period of time and a PI who can support me in writing my postdoctorate fellowship and who could help me in my future prospects. So there were other PIs also. There was this particular PI and I was very interested in her lab, but she was not very good in advancing the career of the postdocs...I did not want that because then you are not progressing, and this is one stage of your career that you want all these things... My PI, she is very young, and she doesn't have much experience in research, but I saw that she is very supportive and she gives you a lot of liberty to design your own experiments and she lets you try things, and she has a lot of good connections. I found her very encouraging and I found her a good match for me, what all I want from my postdoc. Foreign-degreed Participant*

*What really drew me to it was that it was an area that I really wanted to expand to but I had no direct experience in. So I pretty much, I had made a really significant shift in my research focus when I came here, in the direction I really wanted to go. Domestic-degreed Participant*

*I first looked for other jobs...industry jobs and found no way to go there, so I look for closer jobs, and I don't want to switch my field so I just look for the postdoc position that's close to my PhD program. Domestic-degreed Participant*

*My husband has a job here and it's a great job and he waited about two years into my graduate work to be able to find it and just wasn't willing to leave it, and so since they had a training grant opportunity open for me and since he had a great job and I was enjoying what I was doing. I decided to stay. Domestic-degreed Participant*

*I came here just to – first to study overseas, to learn English, to have another experience, [and the] research lab's specific field of pathogenesis. Foreign-degreed Participant*

*We are encouraged to go abroad for our postdocs. I decided to come to the U.S. I could have taken I guess several places and I chose this place for a number of reasons. The supervisor, the status of the institution, and the cost of living I would say are the major factors. Foreign-degreed Participant*

*...also for me like to improve my English, that was one thing, because even if you want to apply to academia or an industry, then I think actually you need to be good in English. So that is also a strong motivation, like something that you really want to acquire during your postdoc. And then there were also the skills. I think that you need to improve the number of skills that you have, because when you apply they are really looking for what you can do and to what extent you can collaborate with other people and so on. Foreign-degreed Participant*

Decisions about postdoc positions were frequently based on limited information. Several participants had spoken only to their prospective PI before deciding to take the position (that is, the PI was their sole source of information). Those who had the opportunity to speak with colleagues of the PI or visit the institution under consideration felt better informed about their decision.

*So what I did is I talked to people who had worked with him before, and he's [PI] a lovely man. He's great. Foreign-degreed Participant*

*I didn't inquire much basically, which I should have. So yeah, I think one should visit the lab if possible before taking a [position]. Foreign-degreed Participant*

*I just had a phone interview and it went really well. So then she'd say well I will ask some of my students to e-mail you, so I received one or two e-mails from the students. Foreign-degreed Participant*

In six cases, the respondents described a situation where they simply took an already open opportunity (like getting an offer from a PI). A pessimistic version of this situation was a “no better choice option”, which was more often mentioned by U.S.-degreed postdocs (five cases). Two postdocs were explicit about using their appointment as what they called a “buffer zone”; that is, a position to help them decide if academia was a good fit or a position that allows them maintain legal status in the U.S.

*I'm not really interested in pursuing a academic job but the visa, [a] working visa for international students has been really tough so taking this postdoc position is kind of a buffer zone for me to sort out my visa status. And also, research-wise, this position gives me the opportunity to apply my own skill in biomedical engineering while still having a chance to learn some bio stuff and do experiments in different skills. Domesitc-degreed Participant*

**Table 2. Grouped Answers on Motivations to Take a Postdoc Position**

	Foreign Degreed	U.S. Degreed
<b>Topic &amp; People to work with</b>		
Research topic	5	4
PI's expertise, reputation, or personality	2	1
Research group	2	
<b>General career advancement</b>		
International experience	5	
Importance of a (U.S.) postdoc for finding a permanent job or funding	3	3
<b>Open opportunity</b>		
Getting an offer through networking	3	
Financing opportunity	1	2
<b>Other</b>		
No better choice	1	5
Family	3	2
Buffer zone	1	
Buffer zone – visa status		1

***Funding***

During the focus groups, participants described how their position was funded. The motivation for including this discussion stems from a concern over whether postdocs are knowledgeable about funding of their positions. Can postdocs provide relevant details about their funding? The answer is yes: nearly all participants across both U.S. and foreign-degreed groups confidently described their primary source of funding. In some situations, funding was awarded directly to the PI; in other situations, the funding was awarded to the lab or center. It was not uncommon for funding to come from more than one source but rarely more than two sources. We heard from one participant whose funding changes frequently in his lab and hence it was difficult to keep track of the source.

Differences in knowledge about funding did not emerge between foreign-degreed and U.S. degreed postdocs. There were more mentions of fellowships in the U.S. degreed groups than foreign-degreed groups and one participant in the foreign-degreed group received funding from a foreign government, but otherwise, the types and sources of did not appear significantly different across the groups.

**Table 3. Knowledge about Funding Source of Postdoc Positions**

	Foreign Degreed	U.S. Degreed
No. of participants in the group	17	17
No. of participants who didn't participate in conversation	4	7
No. of participants who knew type of funding	12	10
No. of participants who knew funding source	12	10
No. of participants who knew to whom the funding was awarded	8	10
No. of participants who reported not knowing about their funding	1	0

## Current Responsibilities

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For many of the participants, their main responsibilities are to obtain data for publications and write up results. Some assist PIs with grant writing, others do coding, and still others mentor graduate students.

The degree of autonomy also varies. Some postdocs reported spending most—or all—of their time advancing their PIs' research. Others explained that their PIs offered them several ideas or broad topics for investigation; the postdocs were then responsible for selecting one, developing an experimental plan, and doing research. A few enjoyed the autonomy to independently design experiments and advance their own research agendas.

*I feel like my only responsibility really is to produce results, and to produce a lot of results and to publish those results; and if I do that, then I've done my job. That was not my expectation coming into my postdoc. Domestic-degreed Participant*

*My responsibilities right now [are to] produce data in order to get more publications. Also my boss [is] interested in applying for grants, so right now I am producing data for those grants. Foreign-degreed Participant*

*With my postdoc, I have half my time to do whatever I want, so I can actually use my time to publish all my past stuff and start new stuff to publish. Domestic-degreed Participant*

*My main responsibility is my own research projects. I started out with one that branched out into about four or five that I'm sort of doing at the same time. I supervised a Master's in (field) student for two years. She finished this March, and we also help out the graduate students. But most of the postdocs in our lab, aside from mentoring, do their own research. Foreign-degreed Participant*

*I would say probably 100 percent on my PI's research. I have two different fellowships. Actually, there's an issue because one of them is 50 percent effort and one of them is 100 percent effort. So currently giving 150 percent, which is not exactly kosher...I have about four different projects, definitely focusing on my PI's stuff. Domestic-degreed Participant*

*I guess 90 percent of work for my advisors and maybe 10 percent for myself. I don't know if that's because I just don't have time to do my own research or if I'm just losing interest in doing it, or both. So mostly I spend time doing what they have planned. Domestic-degreed Participant*

*I've only been here a year, but there's a student starting in the lab in September and I will be responsible for training him, and that's an important skill set to develop, because you're not going to be successful in academia unless you can manage. Foreign-degreed Participant*

*I don't get the impression that at least my boss sees postdocs as training. It's more like the workhorse that does the work that helps write the grants, gets the data for the grants, writes the papers that they can take their time publishing. But I mean that's been my experience...you're learning stuff along the way, so I mean you know, I've helped write a lot of grants and in some ways that can be good because that can help me to write grants for myself in the future. Domestic-degreed Participant*

Both foreign-degreed and U.S.-degreed postdocs indicate they work much more than a 40-hour work week. While it was common to have flexibility as long as “the work gets done,” some postdocs indicated their PIs prefer that they are in their lab from nine to five. A few maintained that they had near-complete flexibility and could be away from their labs for a few days without having this commented upon. Differences between foreign-degreed and U.S.-degreed groups did not emerge.

*Very flexible. I mean, you can work as much or as little as you want. Like we have almost no supervision. As most people know in science it's kind of like running your own business. You get out, if you work hard you can advance. If you don't work, hard then it will be harder to advance. Domestic-degreed Participant*

*...sort of like a glorified grad student. I mean as long as everything gets done. Domestic-degreed Participant*

*Just really long hours. I mean just this week I've done 25 hours in two days; you know, that's just experiments and things that run late, and you don't go home earlier just because you had a long day or the next day. You still find you're still there, at least I do, until later. Foreign-degreed Participant*

*I'd say the average week is probably closer to 60, maybe 70 hours, and even with that, there are more tasks than we can possibly get done in an extended day. Foreign-degreed Participant*

*It's been dictated by the research. Domestic-degreed Participant*

*Although I like my PI, she will always want that you should be here from say nine to five, but she's a little bit flexible. You can ask her and you can get vacation. Foreign-degreed Participant*

*The work is still there, always there. Foreign-degreed Participant*

## **Factors in a Successful Postdoc**

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Participants were given cards with the following activities listed on them and were asked to sort the cards to reflect the order of importance to a successful postdoc:

- Attending conferences
- Creating marketable /profitable products; applying for patents
- Developing grant writing skills
- Developing lab/program management skills
- Developing manuscript review skills
- Developing teaching skills
- Exploring my own research topics
- Improving problem solving skills
- Increasing independence in research
- Increasing subject matter knowledge
- Networking with researchers outside of my department / lab
- Obtaining a permanent job at the end of the postdoc
- Presenting findings at conferences
- Publishing papers
- Working as part of interdisciplinary teams

Consistently, publishing papers and obtaining a permanent job after the postdoc were among the top three most important activities to be accomplished in order to have a successful postdoc when participants were asked to sort the list.

Developing problem-solving skills was infrequently among the top choices for most important, and this was primarily among foreign-degreed participants. Grant-writing skills were also frequently nominated as important. There was little consensus, however, on the remaining high-rated items. Postdocs in three of the groups explained that “exploring their own research topics” was important.

Career interests appear to be a driver for the items at the top of the list for a successful postdoc. For example, several of the participants explained that they would need a different skill set in industry versus academia: obtaining grants was more important for academic careers while supervising others more important for industry careers. Postdocs interested in pursuing a career in a liberal arts college (as opposed to a large, research institution) rated teaching experience highly. Postdocs who had switched fields tended to rate “increasing subject matter knowledge” very highly.

On the “bottom” of several participants’ lists was creating marketable products or applying for patents. Also, because many felt they had manuscript review skills already, they put this lower on their list. In general, however, postdocs across both U.S.- and foreign-degreed groups used their previous experience as a criterion for determining success. Many participants explicitly stated that if they had previous experience in an area, they placed that item at the bottom of their list, or as not important for a successful postdoc.

When asked about skills/activities that were not on the list, but that participants considered important, supervising and mentoring students was mentioned. U.S.-degreed postdocs mentioned time-management skills, work/life balance, clarification about career direction.

### ***Relative Difficulty of Sorting***

The postdocs were asked about the difficulty of the task. They almost unanimously declared it was very easy. This seems to be supported by how quickly—and, for certain items, how consistently—they were able to rate these topics in such a short period of time.

## **Mentoring**

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### ***Formal Plan or Contract***

Few participants began their postdoc with a formal plan describing the expectations and responsibilities of their position. Most had informal meetings with their supervisor/PI upon their arrival. As one participant summarized, having a plan was based on the generosity of the PI. Foreign-degreed postdocs usually had a letter sent by the PI with an outline of a plan for obtaining a visa. These letters only explain that the postdoc was coming to the U.S. to participate in research rather than providing specific details. Others explained that an initial plan was created for them when they first joined, but they had long since outgrown it.

Many had only general direction on what their research project would be. There was a definite sentiment that postdocs “feel through the cracks” in terms of having an orientation to their department which contrasted with their PhD experience.

*When I first started we mainly just talked, kind of like just about projects like to write a few ideas and I just sort of picked up one, and then along the way, kind of different expectations were dropped on you, like I basically ended up running two of her major grants, managing technicians and students and writing progress reports and helping to write research grants. So you never quite know [when] you're going to be tapped to do these different things, and you have to kind of drop everything else that you're doing. I'm not very satisfied with the amount of input that I get. I basically meet with her about every six or nine months because she travels all the time and she's never around, so I mean 'overextended' would definitely describe her. Domestic-degreed Participant*

*I didn't know what was expected of me, and that was never really laid out. I kind of stumbled along blindly for the first year and just got on with my research, but it wasn't actually laid out as well. I know the national postdoc group is currently trying to get some sort of formal structure and review for that, and I think that would be useful, because I did feel like I didn't really have a lot of guidance in what was expected of me. Foreign-degreed Participant*

*When I first took it, I had a meeting with my primary advisor and he sort of laid out some expectations and gave a couple of project ideas. Domestic-degreed Participant*

*You know, when I started, I think I met with my PI the first day, and he's extremely hands off and said, you know, "These are a couple of projects you can start on and always be thinking about your next paper. You know, papers are a measure of productivity, unfortunately, we all have to have some measure of productivity and in academia that's how we measure it often, and just be thinking of that." And that was pretty much it. I probably see him now once a month or once every other month. Domestic-degreed Participant*

*I guess my work expectations were laid out really well before I got here. In fact, I had them write it out and everything. Domestic-degreed Participant*

*On the first day my boss and I sat down and he told me the projects that were going on, and I had some expertise that he didn't have in the lab, so there was a specific route for me to use that expertise to the general benefit. But that was just a starting point, and by now I'm doing things that are very far away from that original plan. Foreign-degreed Participant*

*I kind of took over the position of another postdoc and he trained me and kind of told me about what the project was, and so that's how I learned what my job would be. Domestic-degreed Participant*

*My principal [investigator] or my mentor just basically saved this project for me, and for details, I need to make my own... [a] particular project and particular direction. We're always discussing what we should do next. Domestic-degreed Participant*

*When I come here my PI just led me to give him a proposal what I'd like to do in his group. But he gave me a general area. Just in this area you can choose a topic you'd like to do, and so I gave him a proposal and I established the instruments or the process for the reaction. Foreign-degreed Participant*

## ***Mentoring Relationships***

Mentoring relationships varied widely in terms closeness, depth of interaction and active support of career development. It appeared that the variation was reflective of the communication skills of the PI, their administrative and other commitments, and their travel schedules. No distinct differences emerged between foreign-degreed and U.S.-degreed postdocs.

Most participants felt that a postdoc could be successful even in the absence of a close mentoring relationship in which the mentor provided an optimal level of career development support; however, they also indicated that the mentoring relationship could have an enormously positive impact on the postdoc experience.

A minority (across both foreign-degreed and U.S.-degreed) reported that their mentors networked on their behalf, discussed career options and encouraged strategies for gaining appropriate skills – typical activities one would expect of a mentor. A few participants felt they could not go to their mentor to discuss career plans in fear of being dissuaded to pursue a path they were interested in or that their mentor would decline to provide a recommendation on their behalf, particularly for career interests in industry or teaching at small liberal arts colleges. Several participants continued to rely on their PhD supervisors in the absence of career support from the current PI. Peers were also important in providing support.

*If your PI is not like the picture perfect PI who knows and tells you about all possible funding opportunities, you need other ways to find out. So my PI, whom I rarely see, would not be telling me “oh there’s this grant you should apply to.” So I have to try and find out by myself what type of grant funding is available for me. Where can I find it? How can I write this grant? How can I get there? Foreign-degreed Participant*

*I don’t feel like I’ve gotten very good training or very good mentoring. I’ve gained new skills and learned to work a lot more independently, and I mean in that sense it’s been good, but [not] as far as specific career development type stuff. Domestic-degreed Participant*

*She’s an experienced person and she was totally okay to share her experience. So from the first day I sat with her and we talked about what I was going to do, and then every time she shares her experience. And I mean it’s a huge experience...years in research. So then she – the way I interact with her, even if it was a small amount of time, it was totally beneficial to understand everything, not just research. I think it’s more than just research. Foreign-degreed Participant*

*I think I have a great PI because she was really helpful about my career. I mean I have been here for two years now, but since last summer she’s asking me what I’m going to do, where I’m going to apply. When she finds a position she forwards it to me. She was here to correct my talk for my job interview. She was here to say no this university is not fine for you; take another one. Foreign-degreed Participant*

*I don’t really get anything from my mentor. Any career development sort of advice I’ve been getting is going to outside sources. Like I’ve taken part in a couple of different career development institutes in my field, and there’s actually this thing called Mentor Net. It’s like basically you can – instead of a pen pal you get like basically a mentor. You can sign up to get a mentor at a different institution. So I’m actually getting a lot more career advice from that woman as opposed to my own mentor. I mean basically the biggest advantage of my boss in terms of career advancement is going to be her name. I mean you know, coming from a big lab. Domestic-degreed Participant*

*At a conference I go up to people and introduce myself and do the charm. But it's nicer if your PI can do that, but my PI is way too busy. If he is at the same conference, he will be meeting with the big guys and I won't see him at all, like not even for dinner or so. He's just gone. We might be on the same flight. Foreign-degreed Participant*

*I'm considering getting out of academia. I mean, I haven't made up my mind whether I'm going to stay in or I'm going to get out and so, but I don't feel like I can talk to anybody, my advisor, about getting out because then, you know, the secret's out, you know, and maybe he doesn't want to keep you on for, you know, how long will he keep me there as a postdoc and that sort of thing. So but I think exactly like what you're saying, if you do the research you can do the publications then that is career [advice]. Domestic-degreed Participant*

*I feel like my Ph.D. mentor does more helping me than my postdoc mentor. He's a chair of a department and he's an editor of a journal, so he, you know – whenever – you know, as a grad student, he always encouraged me to go to a lot of meetings, and even now, he's always encouraging me to meet people and having me review papers to help to put me on an editorial board later on...So I mean those are the things that it's nice to have someone who's connected, who can help navigate the path because otherwise you're kind of like, "Ah, I don't know what I'm doing." Domestic-degreed Participant*

*I feel like my previous[PhD] mentor focuses a lot more on my growth in terms of career and getting a position whereas the current mentor, like I said, doesn't really care that much. Domestic-degreed Participant*

### ***Frequency and Type of Contact***

There was great variation in the frequency and type of contact with mentors. Some postdocs had contact several times a week, some communicated every few months. One participant described her PI as intermittently communicative: he might meet informally with her every day for a week and then disappear for several months. Interactions with mentors included group (frequently weekly) meetings and sporadic individual meetings. Many indicated their mentor was accessible, but frequently quite busy. Only a few participants had infrequent or rare interactions with supervisor regarding their research. Some postdocs explained that their PIs were only available by appointment; others had almost unlimited informal contact. For a few, frequent contact reduced their productivity.

*My PI is the dean of the department, which means that I need to have an appointment, a formal appointment, call her secretary and then have the appointment. So I'm trying to not do it often. I know that I can jump in sometimes at the end of the day in her office if I really need to, and sometimes she's helping for some data collection, but we have a really good relationship, so I know that if I really need, I can go, Foreign-degreed Participant*

*My boss is very busy. We usually have the lab meeting once a week with the group, but not everybody actually gets to talk. So I could go for weeks without saying anything if I don't press forward. I can always make an appointment. I would usually get one within the next couple of days if I really need my boss urgently. He usually replies to e-mail within a day or so, so he is accessible, but not all the time. Foreign-degreed Participant*

*It's really random. So sometimes he'll have lunch with us every single day and so we talk about research during lunch, and always another half an hour at night. But sometimes he just totally ignores us for maybe a month or so. Domestic-degreed Participant*

*My group is very small so I have full access anytime with my boss, so it's good. I like this because it's informal. Even if we have the lab meeting every week. Foreign-degreed Participant*

*We have made a regular time for everyone to meet with him every week, and sometimes he will stop by the lab and we can talk with him on some new idea or something. And yeah, he also has an open door policy. Foreign-degreed Participant*

*My PI is fairly hands off. He's always got an open door. I feel like he's kept the lab small enough so that he has time. It's not so bad. At the same time, he really doesn't seek you out that much. He's got a lot of stuff on his plate too. So it's a nice – I mean, for me it works well. I prefer to have that kind of arrangement rather than somebody checking in daily on me. Domestic-degreed Participant*

*I think it's enough because the lab is large enough that there are senior people that if there's some kind of problem that you can always seek somebody out to help you. Domestic-degreed Participant*

*There's so much communication it's overwhelming. We spend hours and hours in meetings every week. Domestic-degreed Participant*

**Table 4. Summary: Beneficial and Challenging Aspects of Mentor Relationship**

<b>Beneficial</b>	<b>Challenging</b>
<ul style="list-style-type: none"> <li>• Good at obtaining funding</li> <li>• Prolific publisher</li> <li>• PI's scientific stature brings good contacts</li> <li>• PI was responsive over e-mail and provides good feedback</li> <li>• Supportive in providing necessary tools and materials</li> <li>• Allows lots of independence and autonomy (not a micro-manager)</li> <li>• Encouraging of new research ideas</li> <li>• Good "sense"</li> </ul>	<ul style="list-style-type: none"> <li>• Need more autonomy in lab management (administrative red tape impedes research progress)</li> <li>• Need more direction and clarification in research (common complain among field-changers)</li> <li>• Need more feedback (both formal and informal)</li> <li>• Need more time to develop ideas</li> <li>• High workload (demands exceed what was reasonable)</li> <li>• Communication was one-way only (PI was often unresponsive)</li> <li>• Lack of human interaction</li> </ul>

## ***Topics to Discuss with Mentors***

We asked participants what would be important to discuss with mentors.

- **Training:** Several participants felt it was important to acknowledge. Others feel postdoc was less about training and more about obtaining a pathway to your research goals.
- **Opportunities for developing expertise:** Some participants felt that this was important and not adequately expressed. Other participants felt like this was not a priority; if they were not already experts, it was understood that they would develop expertise by the end of their postdoc.
- **Progressive increase in responsibility and independence:** There was consensus that progressive increase in responsibility and independence would be useful. Many postdocs felt that they were “thrown in” unprepared for the position.
- **Networking:** Participants felt that the PI’s role in networking would generally be welcomed. Some indicated that they were accustomed to advocating for themselves.
- **Attending professional meetings:** Participants felt that PIs should provide financial support for meeting attendance, and provide direction in which meetings would be most useful for networking.
- **Ethics:** Several participants concurred that this was not a priority. Ethical conduct was a given, and they felt that they were well-versed at this point in their careers.

## **Concepts**

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Participants selected five concepts considered important to measure in a postdoc study from a list developed from activities conducted earlier on the Postdoc Data Project. “Transitions from the postdoc position to a permanent position” was selected as a high-priority topic by nearly all participants (both foreign- and U.S.-degreed). A close second was “opportunities within the postdoc position”, followed by “funding support” and “balance of advisor needs with career development needs”.

Highlighted below are the items selected and the number of participants selecting the item.

- Transitions from postdoc to permanent professional and academic scientific careers **(8 Foreign) (10 US)**
- Career advancement opportunities: opportunities for recognition for own work; opportunities for increasing independence in a research area; opportunities to conduct own research **(7 Foreign) (9 US)**
- Funding support for postdocs **(8 Foreign) (4 US)**
- Balance of advisor needs for productivity and postdoc needs for career development **(2 Foreign) (7 US)**
- Balance between professional and personal activities and needs **(5 Foreign) (3 US)**
- The extent to which the postdoc increased knowledge /improved skills **(4 Foreign) (4 US)**

- Assessment of factors that make a postdoc experience successful **(3 Foreign) (5 US)**
- Aspirations for the next position after the postdoc **(3 Foreign) (3 US)**
- Whether career aspirations have changed since starting the postdoc **(1 Foreign) (4 US)**
- Organization and nature of postdoc work **(3 Foreign) (2 US)**
- Financial status and support **(3 Foreign) (2 US)**
- Duration of postdoc appointments **(2 Foreign) (3 US)**
- Benefits and compensation issues **(2 Foreign) (2 US)**
- If seeking a new position, resources used in the job search process **(2 Foreign) (2 US)**
- Extent to which postdoc prepares for careers outside of academia **(2 Foreign) (2 US)**
- Visa status / dates **(3 Foreign) (1 US)**
- Initial goals and expectations of individuals who take on postdoc positions **(1 Foreign) (3 US)**
- Skills acquired during a postdoc **(4 Foreign) (0 US)**
- Factors affecting postdoc duration **(1 Foreign) (3 US)**
- Mentoring experiences **(2 Foreign) (1 US)**
- What postdocs found most valuable about their appointments **(0 Foreign) (3 US)**
- Assessment of aspects of the postdoc appointment that could be improved **(0 Foreign) (3 US)**
- Information on postdocs working outside academia—what type of training experiences do they receive that may differ from the training that postdocs receive in academia? **(1 Foreign) (2 US)**
- Ways in which quality of life issues influence decisions to continue in postdoc positions **(1 Foreign) (2 US)**
- Employment sector in which postdocs work **(1 Foreign) (2 US)**
- Longer term career goals: where one sees oneself in 5 years **(1 Foreign) (1 US)**
- Whether seeking a new position (permanent or postdoc position) **(1 Foreign) (1 US)**
- Reasons for looking for a new position **(1 Foreign) (1 US)**
- Tracking careers over time **(1 Foreign) (0 US)**
- Integration into the broader organizational environment (outside of the lab or department) **(0 Foreign) (2 US)**
- Hours spent in the position **(0 Foreign) (2 US)**
- Balance of spouse's/partner's personal and professional needs **(0 Foreign) (2 US)**
- Reasons to come to the U.S. / stay in the U.S. / leave the U.S. **(Not selected)**
- Support from colleagues **(Not selected)**
- Whether the postdoc appointment had pre-defined appointment dates **(Not selected)**
- Access to health care **(Not selected)**

- Use of services provided by postdoc offices / postdoc associations **(Not selected)**
- Number of postdocs working in the U.S. **(Not selected)**
- Number of postdocs by discipline **(Not selected)**
- Number of postdocs by demographic characteristics **(Not selected)**

*What's the point, what's the use of a postdoc if they can't get you a permanent job? Domestic-degreed Participant*

*I guess just in terms of are these postdoc total experiences actually training or are they just slaves for the most part? Domestic-degreed Participant*

*What you usually include on a PI's CV is how many PhD students have they had, how many postdocs have they had. So the list of the people my PI mentored is very long. But where did these people go? What happened to them afterward? I mean I can obviously Google them and look that up, but it would be interesting if there were a metric for a measure of success of these people, because the next person considering to join that lab might have a lot of benefit from that. What did the people become? Maybe NSF should give grants depending on these, you know? Like how many postdocs really advanced. Foreign-degreed Participant*

## Transitions from Postdoc to Permanent Positions

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Several participants were actively seeking permanent positions; others were contemplating strategies for finding jobs even if their postdoc was not ending in the next few months. A few were open to another postdoc position. Many were looking forward to academic careers, but some expressed interest in finding commercial-sector positions. Most felt there was intense competition in both sectors for job openings. Foreign-degreed participants remarked on the difficulty in obtaining work visas for positions in industry – it was much easier to obtain a visa if they stayed within academia. About one-half of the foreign-degreed participants expressed interest in returning to their home country after the postdoc.

Several described ambivalence about positions in elite research institutions. Their experience as a postdoc and their observations of often overextended, though quite successful PIs highlighted a desire for more balance with careers and personal lives and also interest in teaching in addition to research. Career decisions and choices were also influenced by family or spousal considerations.

*Coming from Europe, I don't have any student debt. I don't have a debt today. So that is an advantage. So as far as that's concerned, I don't need a job that makes lots of money because I don't have to fill something that's empty. To the market I think absolutely that the market kind of dictates where you want to go. Foreign-degreed Participant*

*The problem in being a postdoc that you can be doing postdoc years and years. Here in the [university] there is a good policy that you [are supposed to] only be a postdoc five years. After that – your boss has the last word. So they change your position something like research assistant professor or something like that. Foreign-degreed Participant*

*I'm monitoring posted jobs but unfortunately there's few in the area that I'm looking. I'm actually working on a couple of contacts that know people at the company I'm targeting to see if I*

*can get contacts that way. I had a personal referral that way and had one interview at Pfizer in March and I had the interview but they had someone else that had better animal skills than what I had so I didn't get it but they said that they'd keep me in mind and so I'm going to keep contacting with those people and hopefully something will come up, but advertised positions I'm overqualified for and so when I apply I don't hear a response because they're looking at a bachelors or – so I think personal contacts are going to help me more. Foreign-degreed Participant*

*There's a two-body problem. Both my husband and I are looking for jobs, so do you look in the same department or do you look at sort of multiple kind of related departments? He also is in neuroscience so we both have the same field, and then there's also this challenge that a lot of universities are stepping up their expectations. For instance, they have a list of, you need to publish in Science or Nature or like they have these big journals and if you don't have a paper in that then sometimes you're just – your application is not even considered. Some of those expectations are a bit unrealistic at times. It can be kind of daunting, but again, that also helps if you can know some people that can help you to get interviews and things like that in certain departments. Domestic-degreed Participant*

*I try to make a point of having a separation between the two [work and personal life] and having enough time for my personal life, but I observe that the people around me – the postdocs and the young professors especially who have don't have tenure are killing themselves. At least that's the way it seems to me...I know that I don't want to kill myself and that's part of the reason why I am thinking about getting out of the field...I see what everybody else is going through and I'm just not interested in it. So I make it a point to separate the two and try to have as much of a balance as I can, but it's a struggle. It's not easy, and there's a lot of guilt that goes along with it. Domestic-degreed Participant*

*I'm drawn to the liberal arts kind of university because everyone says their quality of life is – everyone loves their life...lower stress levels for the faculty at those types of institutions; more passionate about their job, and I feel like all of my postdoc has been – is publishing, publishing, publishing, publishing. Domestic-degreed Participant*

*I think there are examples of people who, they're not the superstars, but you know, they can have a lab, they can have a moderate level of success and they can have family and things like that too. So, I'm trying to shift my sort of admiration from superstars, I want to be like that, to like hey, maybe it's fine to sort of be in the middle and enjoy some amount of success but also enjoy other aspects of your life, too. Domestic-degreed Participant*

*I find it's very hard to have a balance. I have a nine-year-old daughter so I don't have much time to be with her, either I'm working a long time in the lab and also working at home...I think maybe this is because a postdoc is kind of your step in your career process. Domestic-degreed Participant*

*It's unfortunate the academic culture, it just seems to be, if you want to be successful you have to kill yourself and I mean I've been there, I've done that, I've work the 60, 70, 80-hour weeks and then in the last couple of years I've just been like, what am I doing, you know. So and I see my boss, I mean being somebody who's prominent and she doesn't have a personal life. They're just like constantly, constantly working and you know, I'm young and I'm kind of like hmm, if I can make a decision right now to maybe not push my life that way, so but it definitely takes a concerted effort to maintain a balance. Domestic-degreed Participant*

Participants were generally not enthused over the prospect of seeking another postdoc, although a few did express that it was a possibility. In one foreign-degree group, an explicit discussion emerged about the pros and cons of lengthy postdoc appointments and successive appointments, although we did hear some remarks in other groups as well. Foreign-degreed postdocs indicated that a first postdoc may be used to get a foot in the door or build basic skills, while subsequent postdocs may provide opportunity to advance research area.

Some participants felt that multiple postdocs were frowned upon in the industry sector – that a postdoc was a training period and considered a limited term position. One thought that multiple postdocs were frowned upon in academia – that the postdoc offers a “window of opportunity” for advanced training and those who had significant lags in time since degree did not have as much of a competitive edge for faculty positions. Towards the end of the discussion, there was some consensus that such perceptions on lengthy and successive postdocs may vary by the field of study.

## Summary

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The Survey Sciences Group, LLC (SSG) conducted four focus groups with postdocs in the Southeast Michigan area as part of the postdoc questionnaire development task on the Postdoc Data Project (PDP). The focus groups took place during the second week in August, 2008, and consisted of two groups of foreign-degreed postdocs and two groups of U.S.-degreed postdocs. The purpose of the focus groups was to obtain information that would (a) help prioritize questionnaire topics that are not already addressed in National Science Foundation (NSF) Science Resources Statistics (SRS) ongoing surveys and (b) inform best approaches to question wording and questionnaire design.

Most focus group participants, especially those planning to pursue an academic career, considered the postdoc experience an essential step to obtaining a permanent position. We saw no variation across U.S.-degreed and foreign-degreed participants in this belief.

Frequently, a postdoc position affords an opportunity to remain in the same locale or institution as a spouse or partner. For foreign-degreed postdocs, a U.S.-based postdoc was especially important in expanding academic opportunities in their country of origin and allows them to improve their language skills. Occasionally, a postdoc was chosen by foreign nationals who are otherwise interested in an industry position that would require a visa not available to them.

Most postdocs focus on obtaining data and writing up results for publication. Some assist with grant writing and a few mentor graduate students. There was variation in their degree of autonomy. Some postdocs spend most—or all—of their time advancing their principal investigator’s research while others are given broad direction and are then responsible for executing projects. A few have autonomy to concentrate solely on their own research agendas. While many have flexible work schedules, frequently the responsibilities and goals of their position require work weeks that far exceed 40 hours.

Publishing papers and obtaining a permanent job following the postdoc were selected as the most important activities to be accomplished in order to have a successful postdoc from a list presented in the groups. Creating marketable products or applying for patents were generally considered least important, mainly because the majority of the groups were considering academia for a permanent job. These top choices were mirrored in the selection of the concepts “transitions from the postdoc position to permanent employment” and “opportunities within the postdoc position” as important to measure in a postdoc study from a list developed from earlier background research on the Postdoc Data Project. These two concepts were followed by “funding support” and “balance of advisor needs with career development needs” as

important to measure.

Mentoring relationships vary widely in terms of closeness, depth of interaction and active support of career development and participants indicated that this could have an enormously positive impact on the postdoc experience. With only a minority describing mentors consistently networking on their behalf, postdocs utilized additional resources including peers and former mentors (PhD advisors). Degree of contact with mentors also varied widely.

It was rare for participants to begin their postdoc with a formal plan describing the expectations and responsibilities of their position and lack of orientation in general was a disadvantage to new postdocs. Exit plans and strategies for transitions from the postdoc plan were sometimes assisted by mentors. Intense competition was anticipated (or has already been experienced) for both industry and academic sector jobs, but most postdocs prefer to transition to permanent employment rather than seek an additional postdoc position.