# The 2013 Canadian Postdoc Survey:

## Painting a Picture of Canadian Postdoctoral Scholars

CAPS-ACSP and Mitacs

CAPS ACSP
Canadian Association of Postdoctoral Scholars
Association Canadienne des Stagiaires Post-doctoraux

Mitacs

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## Acknowledgments

Our first thanks go to the 1,830 individuals who have shared with us their experiences as Canadian postdoctoral scholars. Thank you.

The 2013 Canadian Postdoc Survey has been a success in large part because of the willingness of stakeholders to distribute and promote it. These stakeholders include university postdoctoral associations, the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council (NSERC), the Social Sciences and Humanities Research Council (SSHRC), and the many institutions that host postdoctoral scholars. We would particularly like to thank Dr. Mihaela Harmos and Dr. Sue Horton, from the Canadian Association of Postdoctoral Administrators (CAPA-ACAP) for helping us to reach out to university administrators across Canada.

Postdocs were able to complete the 2013 survey in either English or French. The French translation was completed by Crabapple Media and proofread by Dr. Sébastien Lévesque, Dr. Suzette Ali, and Dr. Isabelle Duval.

The survey instrument was designed, and the survey itself conducted and analyzed, by Academica Group. Academica's insights and advice were invaluable, and their flexibility throughout the process has been greatly appreciated.

Finally, we would like to recognize the efforts of Dr. Sunny Marche. As Chair of the National Postdoctoral Stakeholder Group, Dr. Marche was a consistent advocate on behalf of Canadian postdoctoral scholars. His strong endorsement at the 2011 Canadian Postdoctoral Policy and Administration Meeting was instrumental in making this survey a reality.


### The Canadian Association of Postdoctoral Scholars/L'Association Canadienne de Stagiaires Post-doctoraux

CAPS-ACSP is the national voice of Canadian postdocs. It works towards clarifying the role of postdocs in Canada, advocates for equitable treatment of postdocs, and represents the interests of postdocs at federal and provincial levels. CAPS-ACSP exists as a volunteer committee of postdoctoral scholars with an elected executive representing institutions across the country.

### Mitacs

Mitacs is a not-for-profit organization that supports national innovation by coordinating collaborative industry-university research projects involving graduate students and postdoctoral fellows. Since 1999, Mitacs has been promoting academic-industrial research and development (R&D) while supporting the development of future researchers. Mitacs has developed a proactive and successful approach to supporting innovation, both directly through collaborative R&D and indirectly through long-term development of skilled human capital.

# Key Observations

The 2013 Canadian Postdoc Survey has two primary objectives: to present demographic data about Canadian postdoctoral fellows (postdocs) and to identify their primary concerns. Many of the concerns expressed by postdocs reflect their current circumstances and future ambitions. Though generally satisfied with the state of their research environment, significant problems are recurrent across the majority of provinces and institutions. These require immediate attention to ensure the healthy continuation of world-class research in Canada.

## Who is the Canadian postdoc?

The average Canadian postdoc is 34 years old. They are male (53%) and female (46%). Most are married or in a common-law relationship (69%). One-third (35%) have dependent children. Over 50% of Canadian postdocs are landed immigrants or on work visas.

In short, postdocs are adults: in the middle of their lives, but at the beginning of their careers.

## What are the key problems?

### Administrative Ambiguity

Postdocs do not have clear employment or administrative status. Postdocs may be classified as employees, students, independent contractors, or trainees. Moreover, their classification within an institution does not necessarily correspond with their federal or provincial employment or labour classification. After years of advanced formal education, most respondents do not perceive themselves as students or “trainees” but as similar to other employees at their institutions, deserving of access to the same employee benefits.

### Low Compensation and Benefits

This survey reveals that approximately two-thirds of Canadian postdocs earn less than $45,000 annually. Many do not have access to their institutions' health or dental insurance plans or are ineligible for employment insurance and pension contributions. Less than half of respondents are satisfied with their salary or stipend, and only 29% of respondents are satisfied with their access to employment benefits. These findings show a dire need for improvement.

### Insufficient Training

The survey confirms that most Canadian postdocs view their position as a stepping-stone to employment as university faculty. However, assuming that there is no significant change in either the number of openings for new faculty or the number of postdoc appointments, the majority of postdocs will not obtain faculty positions. Thus, with respect to training, two key issues emerge. First, postdocs receive insufficient training. Second, the training postdocs seek and receive is designed to prepare them for academic careers that few will obtain; postdoctoral training rarely includes the professional skills needed to succeed in non-academic settings.

Canadian postdocs are the future of Canadian research. The data presented here should guide relevant institutions, organizations, and governments to informed, evidence-based development and the evolution of policies and programs that effectively support Canadian postdocs.

# Executive Summary

> ***A postdoctoral scholar ('postdoc') is defined as an individual holding a recently completed research doctoral degree (or medical professional equivalent) in a temporary period of mentored research or scholarly training. [A Canadian postdoc is] a postdoc who is associated with a Canadian institution, regardless of nationality, citizenship or residency, or who is receiving funding from within Canada.***
>
> ***—CAPS-ACSP***

Postdoctoral scholars ('postdocs') are an essential component of Canada's research community. As highly-trained and experienced early career researchers, they play a key role in driving discovery and expanding knowledge. Postdocs are also the source of future productivity, because postdoctoral appointments are the platform from which the next generation of researchers embarks on independent research careers.

However, most postdoctoral scholarship in Canada has no formal, consistent structure or oversight, either institutionally or nationally. Policies have developed in an ad hoc manner, or have failed to develop at all. The administration and compensation of postdocs have not developed in concert with postdocs' evolving role. Training and professional development have not kept pace with the changing job market.

Efforts to formalize the administration of postdocs and to provide appropriate training opportunities require a clear picture of the individuals for whom policies are being designed. Who are Canadian postdocs? What are their motivations, their goals, and their concerns? How are they currently being administered and how would they like that administration to change? What training are they currently receiving and what training are they seeking?

**Respondents by Institution**

| | |
|---|---|
| University of Toronto | **211** |
| University of British Columbia | **209** |
| McGill University | **202** |
| University of Alberta | **99** |
| University of Western Ontario | **91** |
| Université Laval | **81** |
| McMaster University | **78** |
| University of Saskatchewan | **75** |
| Dalhousie University | **70** |
| Université de Montréal | **59** |
| University of Calgary | **53** |
| versity of Waterloo | **46** |
| University of Ottawa | **44** |
| University of Victoria | **42** |
| Université de Sherbrooke | **38** |
| Queen's University | **32** |
| Samuel Lunenfeld Research Institute | **22** |
| Carleton University | **20** |
| Memorial University of Newfoundland | **20** |
| Other | **329** |
| Prefer not to answer | **9** |
| **Total** | **1,830** |

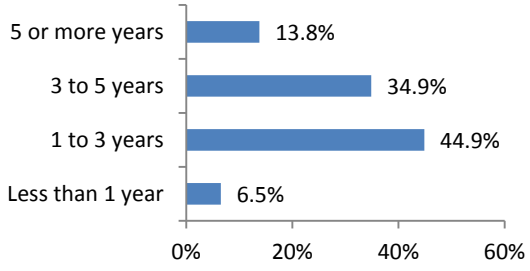
To answer these questions, CAPS-ACSP and Mitacs launched the 2013 Canadian Postdoc Survey. The 1,830 survey respondents include postdocs from diverse research disciplines at 130 universities, hospitals, government laboratories, and private companies across Canada and abroad.

Responses to the 2013 Canadian Postdoc Survey paint a picture of Canadian postdocs as highly-trained, motivated researchers. Respondents are generally satisfied with the research environments that their institutions are providing. However, postdocs repeatedly and resoundingly cite their administrative classification and remuneration as being inconsistent with their expertise and their role within the Canadian research community.

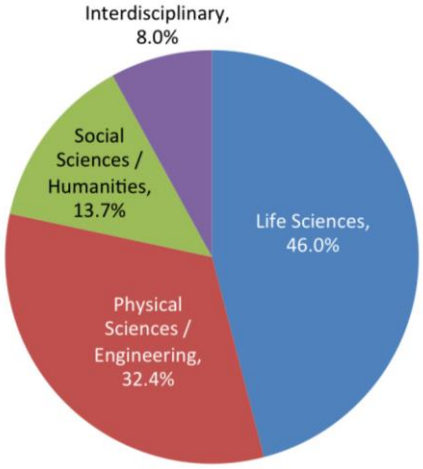
Although postdocs are keenly aware and concerned that their overall numbers outstrip the demand for new university faculty, most view their own position as a stepping-stone to an academic research career. This outlook often results in postdocs who are dissatisfied with their experiences and uncertain about future career options. Highly-skilled researchers are an essential component of our knowledge-based economy. Since only a small capacity exists for growth in university positions, postdocs should be encouraged to explore non-academic career options and to acquire the requisite training and skills.

> ***I don't think that it is fair to expect someone to go through an extended period of education, and then 3-5+ years of temporary, low paid employment as a 'trainee' with no benefits, probably in several different locations before they can even start to apply for permanent employment. The uncertainty is incredibly difficult, especially at a time when people are trying to maintain long term relationships and start families.***
>
> ***—Survey Respondent***

**Total Expected Number of Years as a Postdoc**




**Field of Research**




## Postdoc Profile

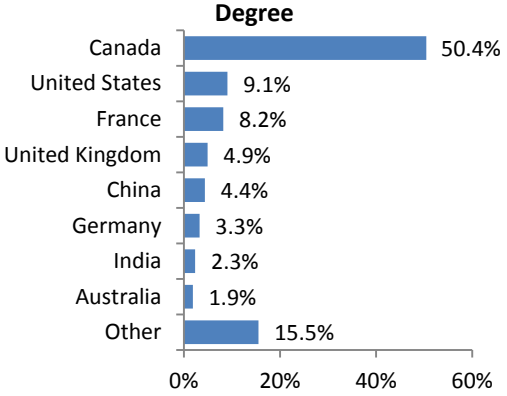
Many of the concerns and priorities highlighted by the 2013 Canadian Postdoc Survey are reflections of the postdoc community's demographic make-up. The average Canadian postdoc is 34 years old. They are male (53%) and female (46%). Most are married or in a common-law relationship (69%). One-third (35%) have dependent children. In short, postdocs are adults.

Most respondents expect to hold a series of postdoctoral positions, and to spend 1-3 years (45%) or 3–5 years (35%) as postdocs before transitioning to stable full-time employment. Thus, qualitatively, over a third of respondents expect the cumulative duration of their postdoctoral appointments to approach that of their doctoral studies. And yet, while considerable attention has been devoted to the needs and concerns of Canada's doctoral students, the needs and concerns of postdocs have been largely ignored.

Postdocs represent a wide range of academic disciplines. Approximately half of survey respondents report their main field of research as Life Sciences (46%), one-third as Physical Sciences/Engineering (32%), 14% as Social Sciences/ Humanities, and 8% as Interdisciplinary.

Nationalities are also diverse: 38% of respondents identified themselves as international postdocs on work permits, and a further 15% as permanent residents. Half of all postdoc respondents completed their highest degree outside of

**Country Where Completed Highest Academic Degree**

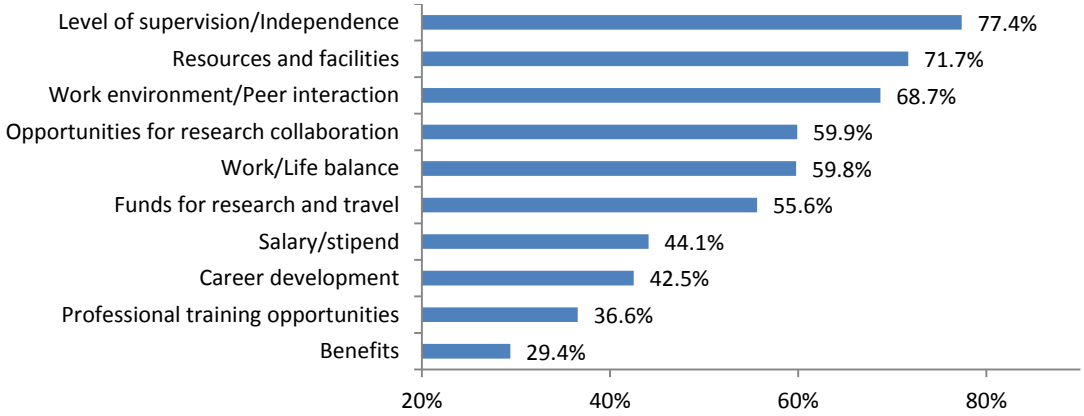



Canada. International mobility facilitates knowledge transfer, encourages the establishment of new research networks, and can help to maintain Canada's reputation for research excellence. Smooth transitions between institutions are essential both for postdocs and for host institutions. This report draws attention to the unique needs of Canada's international postdocs.

## Concerns and Satisfaction

Most respondents (77%) are completely or somewhat satisfied with the level of supervision they receive, and 72% are satisfied with the resources and facilities available for their research. However, less than half are satisfied with their salary (44%) and access to benefits (29%), or with the career development (43%) and professional training (37%) opportunities they have at their institutions.

**Satisfaction Level (Completely or Somewhat) with Elements of Postdoctoral Administration and Training**




## Compensation and Administration

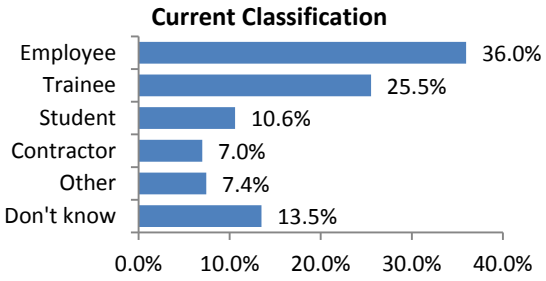
*I make less as a postdoctoral fellow than I [made] as a PhD because of income tax. Furthermore, postdoctoral fellow[s] don't have access to medical clinics in universities because they are not students. But we are not employees either. That gray zone between students and employee is really frustrating.*

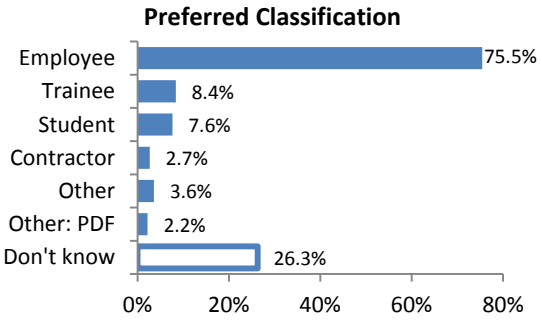
*Coming to Canada for a postdoctoral 'training' is a financial disaster in every way.*

*—Survey Respondents*

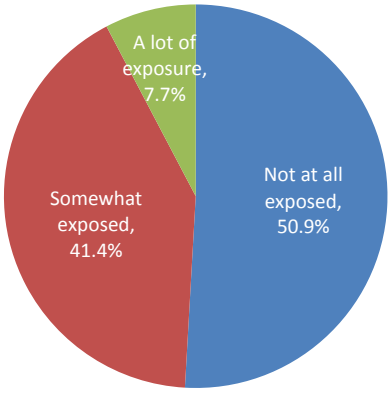
Many postdocs are dissatisfied with their salary and benefits. Approximately two-thirds of respondents (63%) have a gross annual income less than $45,000. Access to benefits varies widely. The majority of postdocs are paid through a supervisor's research grant (49%) or through fellowships (20%) from the Tri-Council national research funding agencies (CIHR, NSERC, SSHRC). Given that the Tri-Council also funds a significant proportion of faculty research grants, they are in a strong position to provide leadership in revising postdoc administration, including compensation and benefits.

Concerns surrounding access to benefits are related to inconsistencies in postdoc classification by provincial and




**Exposure to Non-Academic Career Opportunities**




federal governments and by host institutions. Currently, postdocs report a confusing array of classifications, as employees, students, independent contractors, and trainees. Many postdocs are uncertain of their administrative classification. Among survey respondents who express a preference, the significant majority (75%) indicate that they would prefer to be classified as employees. This preference reflects the desire for statutory benefits (Employment Insurance, Canada Pension Plan) and for commonly negotiated employee benefits (extended health and dental insurance).

Postdocs who have neither employee nor student status express a particular dissatisfaction with their inability to access the rights and benefits of either classification. Some respondents also feel that student and 'trainee' designations are insulting given their experience and expertise.

## Career Development and Professional Training

Most postdocs view their postdoctoral appointment as a stepping-stone to a faculty position. "University research faculty" is among the original career goals of 81% of survey respondents prior to their postdoc appointment. When asked about current career goals, that frequency drops to 69%, but university faculty remains the dominant career goal. Given the challenges in securing faculty appointments, many postdocs will find that their aspirations do not match reality.

"Academic tunnel vision" is reflected in the career development and professional training opportunities that postdocs seek out and that universities provide. The most common skills sought by postdocs are those that will prepare them for a faculty position, e.g., grant or proposal writing, project management, and teaching skills.

Barring significant changes in the supply of postdocs or the demand for new faculty, only a minority of postdocs will obtain a faculty position. And yet, half of the survey's respondents report having no exposure to non-academic careers, and 87% either have no access to career counselling or are uncertain of their access. Canadian postdocs would benefit from broader training and greater exposure to non-academic training opportunities.

***I am constantly stressed that I won't be able to get a job as a university professor, but I really don't have a satisfactory 'plan B' if this doesn't work out.***

***—Survey Respondent***

In summary, the 2013 Canadian Postdoc Survey provides a comprehensive, up-to-date picture of Canadian postdocs. CAPS-ACSP and Mitacs believe that the Survey will provide a valuable tool as Canadian research institutions and organizations seek to develop progressive approaches to postdoctoral administration and training. The Survey confirms that most Canadian postdocs believe the Canadian research environment is conducive to productive research. However, two concerns are in urgent need of attention:

First, many postdocs are unhappy with their administrative or employment status and with the corresponding salary and benefits. ***Postdocs would like to be treated as employees, and to receive benefits and compensation commensurate with their work and experience.***

Second, respondents are very concerned that, after investing years as postdocs, their career opportunities remain uncertain. Successful transitions from postdoctoral scholarship to independent careers are in Canada's interests as well as those of Canadian postdocs. ***Canadian postdoctoral appointments should be supported with appropriate and relevant career development opportunities*.**

CAPS-ACSP and Mitacs look forward to working with universities, research institutions, funding agencies, and governments to identify and implement solutions to these challenges.

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## List of Acronyms and Abbreviations

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| CAPS-ACSP | Canadian Association of Postdoctoral Scholars - Association Canadienne des Stagiaires Post-doctoraux |
| CAPA-ACAP | Canadian Association of Postdoctoral Administrators - Association Canadienne des Administrateurs Postdoctoraux |
| CIHR | Canadian Institutes of Health Research |
| CPP | Canada Pension Plan |
| CRA | Canada Revenue Agency |
| EI | Employment Insurance |
| NSERC | Natural Sciences and Engineering Research Council |
| Postdoc | Postdoctoral Scholar and/or Postdoctoral Fellow |
| SSHRC | Social Sciences and Humanities Research Council |
| Tri-Council | Collective name for the three national research funding agencies (CIHR, NSERC, SSHRC) |

## Introduction and Background

This report presents an overview of results from the 2013 Canadian Postdoc Survey, conducted by CAPS-ACSP and Mitacs in March and April 2013. It paints an up-to-date picture of Canadian postdoctoral scholars (postdocs) and aims to stimulate positive changes in Canadian postdoc administration and training. We have made a conscious decision not to propose explicit policy revisions in this report. However, we do identify the critical issues and concerns that the survey data suggest should be addressed.

CAPS-ACSP defines a postdoctoral scholar as "*an individual holding a recently completed research doctoral degree (or medical professional equivalent) in a temporary period of mentored research or scholarly training*"[1] (CAPS-ACSP 2010).

Postdocs are an exceptionally important component of the research community. They contribute disproportionately to research productivity (Vogel 1999; Black and Stephan 2010) and are often the individuals providing day-to-day supervision and mentorship of undergraduate and graduate students. Because postdoctoral scholarship is typically a highly mobile period, postdocs are a key vector in knowledge transmission and the establishment of collaborative research networks (Black and Stephan 2010). Most importantly, postdoctoral appointments are the platform from which new researchers embark on independent careers (Davis 2009). For all of these reasons, it is essential that Canada and Canadian institutions develop guidelines for postdoc administration and training.

Traditionally, postdoctoral appointments have been viewed as short-term positions intended to bridge the gap between completion of a PhD and employment as a university professor. This perception is no longer accurate. The gap has lengthened (CAPS-ACSP 2009; this report). As the production of new doctoral graduates has far outpaced universities' needs for new faculty, most doctoral graduates will not obtain a faculty position (McKenzie 2007; Fuhrmann et al. 2011; Maldonado et al. 2013). The demographic make-up of postdoc populations has also changed.

These changes have spurred recognition that the administration and training of postdocs must be realigned to the current job market. This realignment requires a clear picture of the Canadian postdoc population. CAPS-ACSP produced the first such picture in 2009, when it presented the results of the first Canadian Postdoc Survey (CAPS-ACSP 2009). In addition to demographic data, the 2009 report provided much-needed information on key issues, including compensation and benefits, taxation, career prospects, and satisfaction.

Since 2009, the postdoctoral landscape has evolved. Questions surrounding postdoc administrative status have been partially addressed at the federal, provincial, and institutional levels and some institutions have taken the opportunity to revise their approaches to postdoctoral training. Canada's postdoctoral population is now much easier to contact and engage than it was in 2009, both because CAPS-ACSP has a wider reach and because institutional record-keeping has improved. Thus, there was a need, and an opportunity, to collect new data that is up-to-date and reflects current realities.

[1] CAPS-ACSP's definition recognizes that, while most postdoctoral appointments are research-oriented, some universities also appoint "postdoctoral teaching fellows".

In 2009, with few exceptions, Canadian institutions did not consider postdocs to be employees (CAPS-ACSP 2009). Like graduate students, most postdocs were paid fellowships rather than salaries. Because fellowships paid to registered students are tax-exempt, some institutions were exploring the possibility of registering postdocs as students (Marche 2010). However, many institutions were hesitant to take that step without clear federal guidelines. The 2009 survey described postdocs' unhappiness with their uncertain status, but there was no consensus around a single preferred solution.

The 2010 federal budget clarified that postdocs are not students and that postdoctoral fellowships are not tax-exempt at the federal level. (N.B., postdocs are classified as students within the province of Quebec, and their fellowships are exempt from provincial income tax.) Furthermore, in 2012 the Ontario Labour Board ruled that, from a labour perspective, internally-funded postdocs at the University of Toronto are employees (Canadian Union of Public Employees v Governing Council of the University of Toronto, 2012). In addition, several universities have proactively reclassified some postdocs as employees. However, postdocs at many universities remain in administrative limbo, as do postdocs funded through externally-administered fellowships, such as Tri-Council fellowships. The 2013 Canadian Postdoc Survey asks postdocs how they are currently being administered and how they would like to be administered. The responses suggest that most postdocs would prefer to be administered as employees.

The 2009 survey also drew attention to the need for new approaches to postdoctoral training and career guidance. Discussions surrounding postdoctoral training have been, and continue to be, a logical extension of efforts to revise the training of doctoral students. Revision is necessary because doctoral and postdoctoral scholarship is no longer primarily a prelude to an academic career. Revising postdoctoral training is challenging because postdoctoral training has traditionally been at the sole discretion of the faculty advisor. Unlike graduate students, there is often no university oversight of postdoctoral supervision. The 2013 Canadian Postdoc Survey was an opportunity to ask postdocs about the training that they receive, the training that they would like to receive, and about their career goals.

It is much easier to survey postdocs now than it was in 2009. CAPS-ACSP has grown, and is better able to reach its members directly. Canadian institutions are also keeping much better records of their local postdoctoral communities. In 2012, the Canadian Association of Postdoctoral Administrators (CAPA-ACAP) estimated that there were approximately 9,000 postdocs working in Canadian universities and research hospitals (Harmos 2012). In contrast, as recently as 2010, CAPS-ACSP and CAGS (the Canadian Association for Graduate Studies) worked under the assumption that there were approximately 6,000 Canadian postdocs (CAPS-ACSP 2009; Kreisworth 2010). The revised estimate is not necessarily due to an increase in the size of the postdoctoral population; it may be due to an increased attention and commitment to postdocs by host institutions. The 2013 Canadian Postdoc Survey leverages that interest: the support of postdoctoral administrators at universities across Canada has been instrumental in delivering this survey to Canadian postdocs.

# Methodology

For the 2013 Canadian Postdoc Survey, CAPS-ACSP partnered with Mitacs, a national not-for-profit organization that supports graduate and postdoctoral training. The 2013 Postdoc Survey is designed to provide an updated profile of postdocs, and to gain more detailed information on training opportunities available and desired, benefits priorities, challenges facing international postdocs, and satisfaction with specific aspects of the postdoctoral experience.

The survey dataset is exceptionally rich. There are many opportunities for future work addressing more focused questions and targeting particular subsets of the postdoctoral population. We make some observations concerning sub-populations in this report, most notably with respect to Canada's international postdocs. However, in-depth contrasts and associated discussion are beyond this report's scope. Instead, we present an overview, painting a picture of Canadian postdocs and drawing attention to what CAPS-ACSP and Mitacs view as the most important issues facing Canada's postdoctoral population.

CAPS-ACSP and Mitacs contracted Academica Group to support the development of the survey instrument and to administer the survey. The Canadian Postdoc Survey was conducted online from March 22 to April 29, 2013. The target population was Canadian postdoctoral scholars, who were defined as individuals holding a postdoctoral position at an institution in Canada, or individuals holding a postdoctoral position who were receiving funding from a Canadian source.

## Survey Questions

The survey instrument was informed by the CAPS-ACSP 2009 survey, the U.S. Sigma Xi Postdoc Survey, and input from CAPS-ACSP and Mitacs. The survey questions were drafted by Academica Group in close consultation with CAPS-ACSP and Mitacs. The instrument was programmed online. A pre-test with 27 postdocs was then conducted with open-ended text boxes on each survey page for feedback on the clarity and wording of each question and on the range and suitability of the response options. The pre-test feedback was used to refine the survey questions. Once the instrument was finalized, it was translated into French to provide respondents the option of participating in either official language.

## Distribution of the Survey

The distribution of the survey presented significant challenges because there is no complete list of Canadian postdocs. One distribution option was to work through individual institutions that host postdocs, as was done with the U.S. Sigma Xi Postdoc Survey (Davis 2005). This was ultimately ruled out due to the variability in the quality and comprehensiveness of institutional lists in Canada. In an effort to reach a wide range of postdocs, the survey was deployed in a variety of ways. Direct email invitations with an embedded survey link were sent to a number of individuals and organizations, including institutional postdoctoral administrators, the Tri-Council agencies, institutional postdoctoral associations, the CAPS-ACSP membership, and Mitacs. Survey links were posted on social media and an article was written in the nationally distributed University Affairs magazine. The email survey invitation was crafted in English and French, and outlined the goals of the survey as well as the survey procedures. CAPS-ACSP and Academica Group followed up directly with postdoctoral administrators and a second general call was issued toward the end of the survey window to encourage participation.

## Analysis

Data was analyzed using IBM SPSS Statistics 20. Throughout this report, subgroup analysis using respondent characteristics was conducted where applicable. The primary variables used to conduct subgroup analysis were: Field of Research (Life Sciences, Physical Sciences/Engineering, Social Sciences/Humanities, or Interdisciplinary), Postdoc Location (Canada or "out-of-country"), and Region of Residence (Atlantic, Quebec, Ontario, Prairies, B.C.)[2]. Because a nonprobability sampling method was used, no estimates of sampling error can be calculated.

### Note about Terminology

Throughout this report the term “international postdoc” is used to refer to postdocs who are in Canada on a work permit. The term “out-of-country postdoc” is used to refer to Canadian-funded postdocs who are completing their postdoc at an institution outside of Canada.

## Structure of the Report

The 2013 Canadian Postdoc Survey will be used by individuals and organizations with diverse interests and needs that we cannot fully anticipate[3]. Therefore, rather than restricting this report to the key findings outlined in the Executive Summary, we are presenting the survey results in their entirety. In general, results pertaining to the overall Canadian postdoc population are reported in the body of this report. Contrasts among subpopulations are presented in appendices, with brief summaries given in the main text.

The survey results are broken down into following categories:

I. **Response Coverage**: the distribution of respondents across institutions and research disciplines

II. **Demographics**: demographic characteristics of the Canadian postdoc population

III. **Administration and Compensation**: classification of postdocs for administrative, labour, and taxation purposes; their remuneration and benefits; and postdocs' concerns as they relate to these factors

IV. **Training, Professional Development, and Career Options**: postdocs' career aspirations; training and career development opportunities currently available to postdocs; and the training and career development opportunities that postdocs would like to have available

V. **International Mobility**: topics specific to movement to and from Canada

VI. **Satisfaction**: postdocs' satisfaction both overall and with specific aspects of their appointments

[2] "Postdoc Location” was coded as “Canada” if the respondent's institution was in Canada and “Out-of-Country” if the institution was outside of Canada. In cases where no institution name was provided (n=9), Region of Residence was used to code the case. “Region of Residence” was coded using the respondents' current province of residency. PEI, Nova Scotia, Newfoundland and Labrador, and New Brunswick are categorized as “Atlantic”. Alberta, Manitoba, and Saskatchewan are categorized as “Prairies”. The one respondent from the Yukon Territory is grouped with B.C. Respondents are excluded if they are neither residing in Canada nor receiving their primarily funding from a Canadian source.

[3] The results of survey questions intended specifically to facilitate CAPS-ACSP’s internal operations have been excluded.

# Survey Response

## Participants

Based on an estimate of 9,000 postdoctoral scholars, approximately 20% of all Canadian postdoctoral scholars completed the survey. After ineligible responses and duplicate entries were removed, 1,830 cases were retained for analysis[4]. Given the methods of distribution by e-mail, web notification, and distribution lists, it was not possible to calculate a traditional response rate.

## Canadian Research Institutions Represented

More than 130 institutions are represented in the survey, including universities, hospitals, and industry. Most respondents are completing their postdoc in Canada (96.3%). The 3.7% of respondents who are completing their postdoc at an institution outside of Canada are referred to throughout the report as out-of-country postdocs (n=68).

Table 1 gives the number of respondents by institution for those institutions from which there were 20 or more respondents.

**Table 1: Respondents by Institution**

| | Number of Respondents | | Number of Respondents |
|---|---|---|---|
| University of Toronto | 211 | University of Waterloo | 46 |
| University of British Columbia | 209 | University of Ottawa | 44 |
| McGill University | 202 | University of Victoria | 42 |
| University of Alberta | 99 | Université de Sherbrooke | 38 |
| University of Western Ontario | 91 | Queen's University | 32 |
| Université Laval | 81 | Samuel Lunenfeld Research Institute | 22 |
| McMaster University | 78 | Carleton University | 20 |
| University of Saskatchewan | 75 | Memorial University of Newfoundland | 20 |
| Dalhousie University | 70 | Other | 329 |
| Université de Montréal | 59 | Prefer not to answer | 9 |
| University of Calgary | 53 | **Total** | **1,830** |

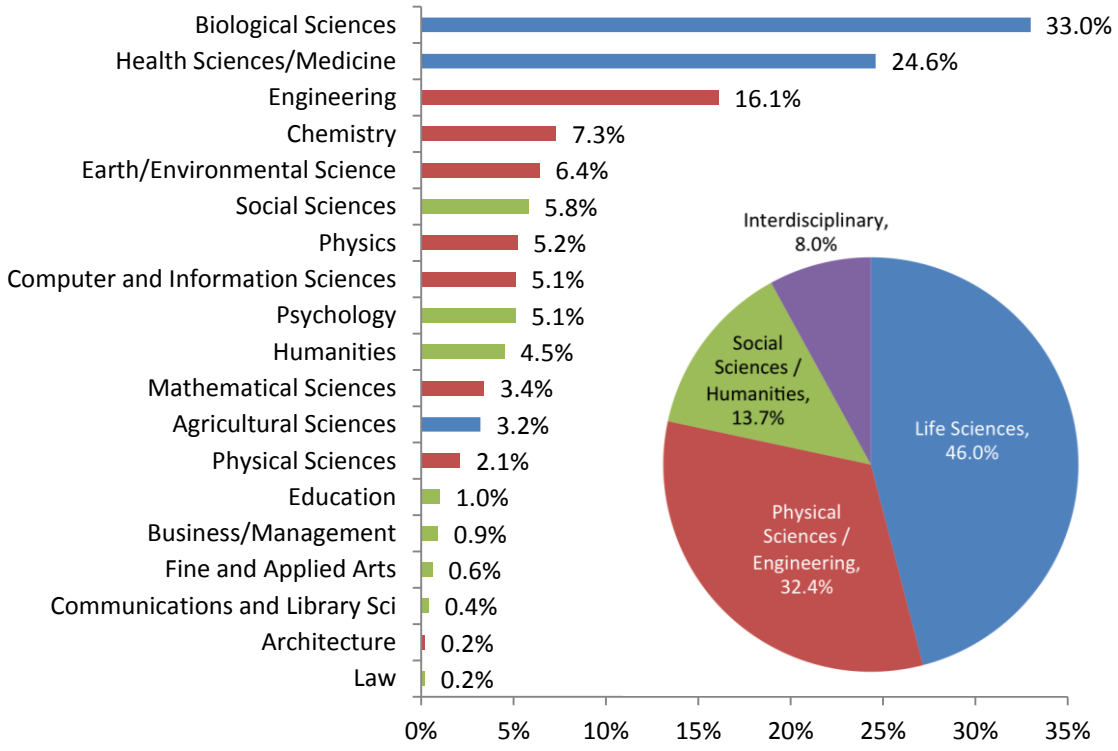
[4] In total, 54 cases were removed.

## Fields of Research

The most common fields of research reported by respondents are Biological Sciences (33.0%) and Health Sciences/Medicine (24.6%) (Figure 1). When compared with the 2009 CAPS-ACSP survey, there is a marked increase in the proportion of respondents who reported Engineering as their field of research (16.1% in 2013 vs. 5% in 2009).

To enable comparisons by field of research throughout the report, the fields of research are collapsed into four categories: 1) Life Sciences; 2) Physical Sciences/Engineering; 3) Social Sciences/Humanities; 4) Interdisciplinary. The specific fields grouped into each category are colour-coded in Figure 1. Respondents are categorized as Interdisciplinary if they selected fields of research that fall into two or more of the other three categories.[5]

**Figure 1: Field of research (multiple response)**




[5]Statistics Canada's Major Field of Study was used to code the fields of research. The four broad categories are based on the U.S. Sigma Xi Postdoc Survey report (Davis 2005), with "Interdisciplinary" added to capture respondents whose fields of research span multiple categories.

# I. Demographic Profile of Postdocs

### Profile of Postdocs in Canada

Almost all respondents report holding a doctoral degree (99.2%), and 2.5% hold a medical degree. Half of respondents completed their highest degree in the last 2.5 years (52.5%), but a significant proportion (15.4%) completed their degree five or more years ago (Figure 2).

**Figure 2: Year completed highest academic degree**

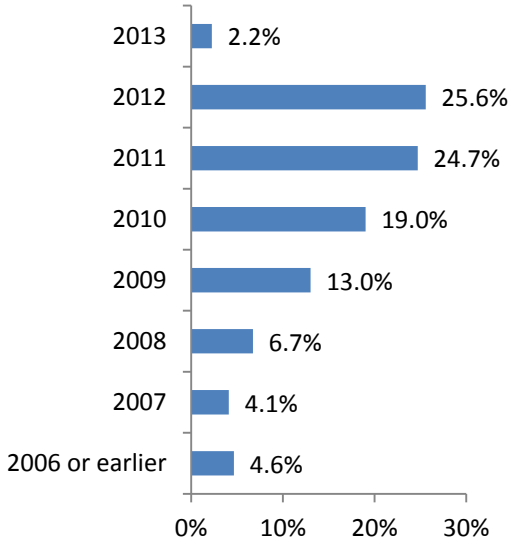



Table 2 presents the demographic profile of the survey respondents. (See also Table 6 and Figure 23 for a summary of international demographics). Respondents are roughly split between female (46.5%) and male (53.4%). The mean age is 33.8 years. Over two-thirds of respondents are in common-law relationships or married (68.9%), and just over one-third have dependent children (35.3%). In short, postdocs are adults.

Many of the concerns and issues that are described in the sections below follow from this demographic reality. For example, many respondents, particularly women, used an open-ended comment box to write about the challenge of having a family while meeting the demands of their postdoctoral appointment (cf. Martinez et al. 2007; Adamo 2013).

> ***As a mom I feel that my career is suffering because my children come first, which means that any progress on longer-term projects or writing takes a back seat, and I am constantly feeling like it would be better for us if I stayed home with the kids. I miss them horribly, but feel like if I don't keep progressing on my career too, I won't get anywhere, so I'm really only putting half my effort in for my kids, and my work, instead of being fully engaged in just one task. I love research, and I love academia, but I love my family more. How can we find a better work-life balance?***
>
> ***—Survey Respondent***

**Table 2: Demographics**

| | | % | *n* |
|---|---|---|---|
| **Gender** | Female | 46.5 | *839* |
| | Male | 53.4 | *963* |
| | Other | 0.1 | *2* |
| | *Prefer not to answer* | | *26* |
| **Age** | 25 to 29 | 15.2 | *277* |
| | 30 to 34 | 51.5 | *938* |
| | 35 to 39 | 21.8 | *397* |
| | 40+ | 11.5 | *209* |
| | *Prefer not to answer* | | *9* |
| **Marital status** | Single, never married | 29.2 | *524* |
| | Married/common-law | 68.9 | *1238* |
| | Divorced/separated/widowed | 1.9 | *34* |
| | *Prefer not to answer* | | *34* |
| **Dependent children** | No dependent children | 64.7 | *1166* |
| | 1 | 19.1 | *345* |
| | 2 | 12.2 | *220* |
| | 3 or more | 4.0 | *71* |
| | *Prefer not to answer* | | *28* |
| **Region of residence** | Atlantic | 5.9 | *108* |
| | Quebec | 24.8 | *453* |
| | Ontario | 36.4 | *666* |
| | Prairies | 14.0 | *256* |
| | B.C. | 15.5 | *284* |
| | Outside Canada | 3.4 | *63* |
| **Community size** | Rural area (<1,000) | 0.6 | *11* |
| | Town (1,001 - 10,000) | 2.3 | *43* |
| | Small/medium city (10,000 - 100,000) | 12.1 | *221* |
| | Large city (100,001 - 500,000) | 28.5 | *522* |
| | Major urban centre (>500,000) | 56.4 | *1033* |
| **Disability** | Yes | 0.9 | *17* |
| | No | 99.1 | *1791* |
| | *Prefer not to answer* | | *22* |
| **Ethnic, Cultural, or Racial Background** (Multiple Response) | Arab | 3.8 | *64* |
| | Black | 2.6 | *44* |
| | Caucasian/White | 65.2 | *1103* |
| | Chinese | 10.9 | *184* |
| | Filipino | 0.2 | *3* |
| | First Nations, Métis, or Inuit | 1.1 | *3* |
| | Japanese | 1.1 | *19* |
| | Korean | 0.6 | *11* |
| | Latin American | 5.2 | *88* |
| | South Asian | 8.5 | *144* |
| | Southeast Asian | 1.4 | *24* |
| | West Asian | 5.0 | *85* |
| | Other | 0.4 | *6* |
| | *Prefer not to answer* | | *137* |

# II. Postdoctoral Administration and Compensation

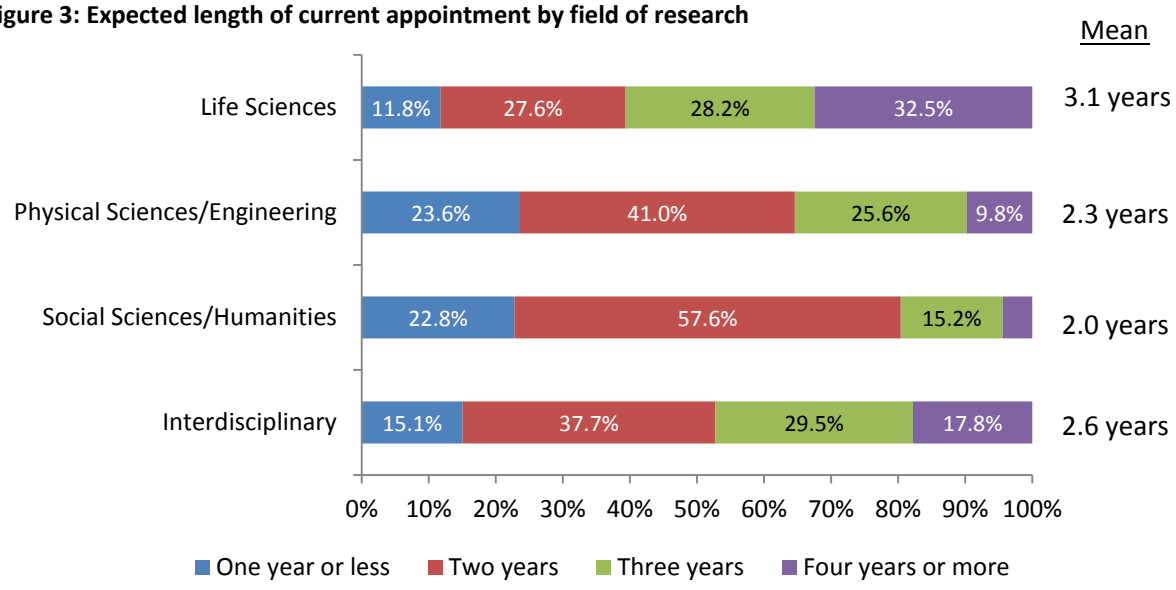
> ***We are taxed as though it is regular income, and yet don't get EI. It seems unfair. Not to mention the fact that with taxes I actually took home more as a PhD student, than I did as a postdoc.***
>
> ***—Survey Respondent***

Postdoctoral scholarship often consists of a series of appointments of variable duration. The administration associated with each appointment (i.e., the postdocs' institutional, labour, and taxation classification, and their remuneration and benefits) can vary widely. As outlined below, issues related to administration and compensation remain primary concerns of many Canadian postdocs.

## Number and Length of Appointments

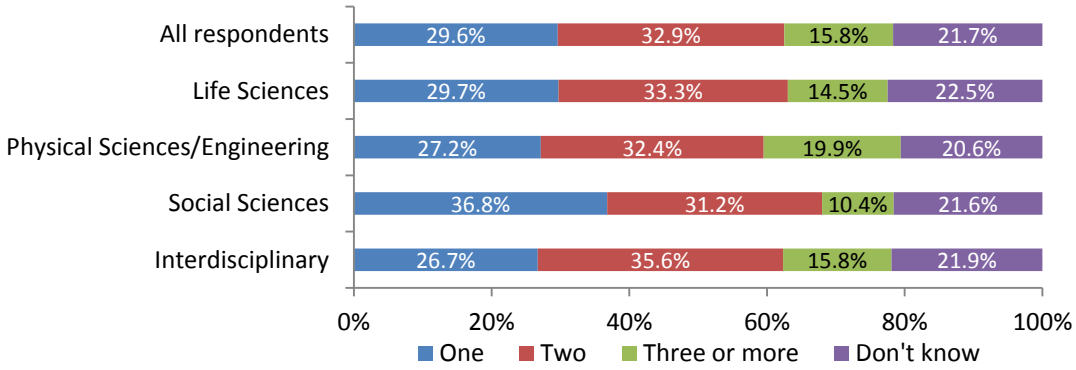
Most respondents are completing their first postdoctoral appointment (69.1%), 25.2% are completing their second appointment, and 5.7% are completing their third or higher appointment. The expected length of current appointments varies considerably (Figure 3). The average appointment length is longer in Life Sciences than in other fields.

**Figure 3: Expected length of current appointment by field of research**



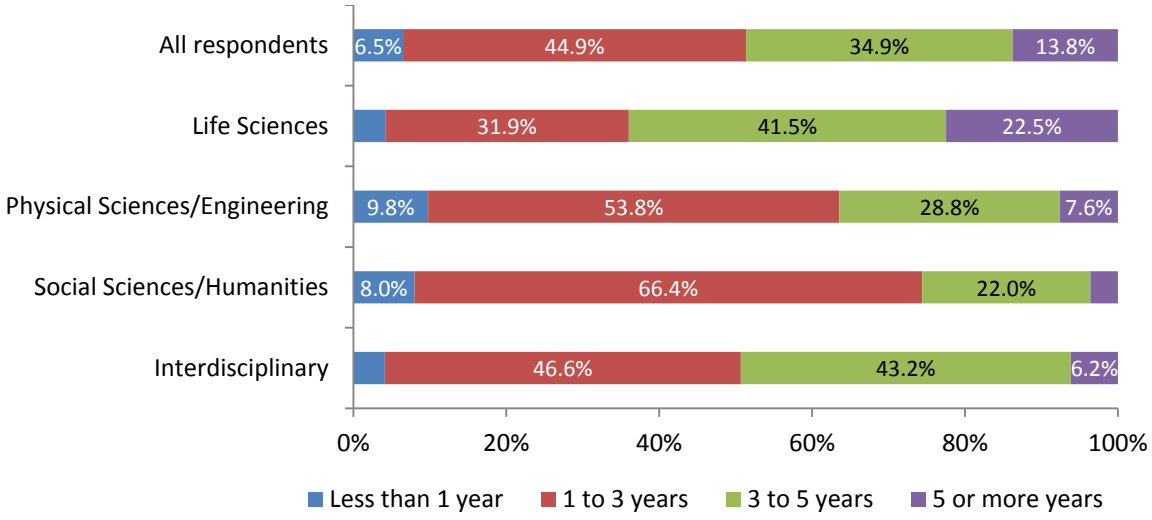

Most respondents expect to complete one (29.6%) or two (32.9%) appointments (Figure 4). However, a sizeable proportion expect to complete three or more (15.8%) and 21.7% of respondents are not able to provide an estimate of the number of appointments they expect to complete. Physical Sciences/Engineering postdocs are more likely to expect to complete three or more appointments than those in the Social Sciences/Humanities.

**Figure 4: Total expected number of postdoctoral appointments**




The number of years respondents expect to be a postdoc is a function of both the length and number of successive appointments. Together, the survey data show that Life Sciences postdocs expect to complete the same number of postdoctoral appointments as those in other fields (Figure 4), but expect those appointments to be longer (Figure 3). Respondents in Life Sciences are more likely than those in Physical Sciences/Engineering and the Social Sciences/Humanities to expect to be a postdoc for three or more years (Figure 5).

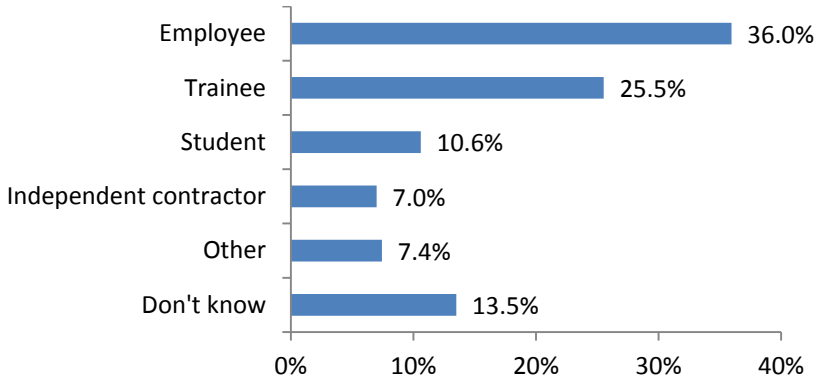
**Figure 5: Total expected number of years as a postdoc**




## Labour Classification

The report arising from the 2009 CAPS-ACSP Postdoctoral Survey devoted considerable attention to inconsistency and ambiguity in the labour classification of Canadian postdocs. The results of the 2013 survey suggest that this inconsistency remains. Postdocs report being classified as employees, trainees, students, and independent contractors (Figure 6). More than one-tenth of respondents do not know how they are classified. Respondents who selected “other” were asked to specify their classification. In addition to responses such as visiting scholar, research associate, and postdoctoral fellow, frustration is evidenced by the use of words such as “ghost”, “limbo”, “no status”, and “no one ever seems to know”.

**Figure 6: Classification status**[6]




## Taxation

Tax forms offer an alternative approach to characterizing labour classification. Consistent with the variable labour classifications described above, postdocs indicate that income is reported for tax purposes in a variety of ways. The most common tax forms received are a T4 (39.6%) (employee) and a T4A code 05 (33.2%) (scholarship/fellowship). The proportion of respondents who report receiving a T4 is similar but not identical to the proportion who report being classified as an employee at their institution (39.6% vs. 36.0%, respectively). Apparent mismatches between respondents' reported labour classifications and the tax forms that they report receiving are summarized in Appendix 2. In Quebec, a T4A code 5 is the most common tax form (41.1%) (

Figure 8). Quebec is also virtually the only province in which postdocs received a T2202A (Tuition, Education, and Textbook Amounts Certificate) (9.3% of Quebec respondents compared to 0.6% in the rest of Canada). Most postdocs in Quebec who received a T2202A report that their primary source of funding is their supervisor's research grant. Variation in the tax forms that respondents receive and discrepancies between tax forms and labour classification further illustrate the ongoing confusion surrounding postdoctoral status.

[6] Some of the variation in appointment classification is associated with region and with field of research. For a summary of these patterns, see Appendix 1.

**Figure 7: Tax forms received (multiple responses)**

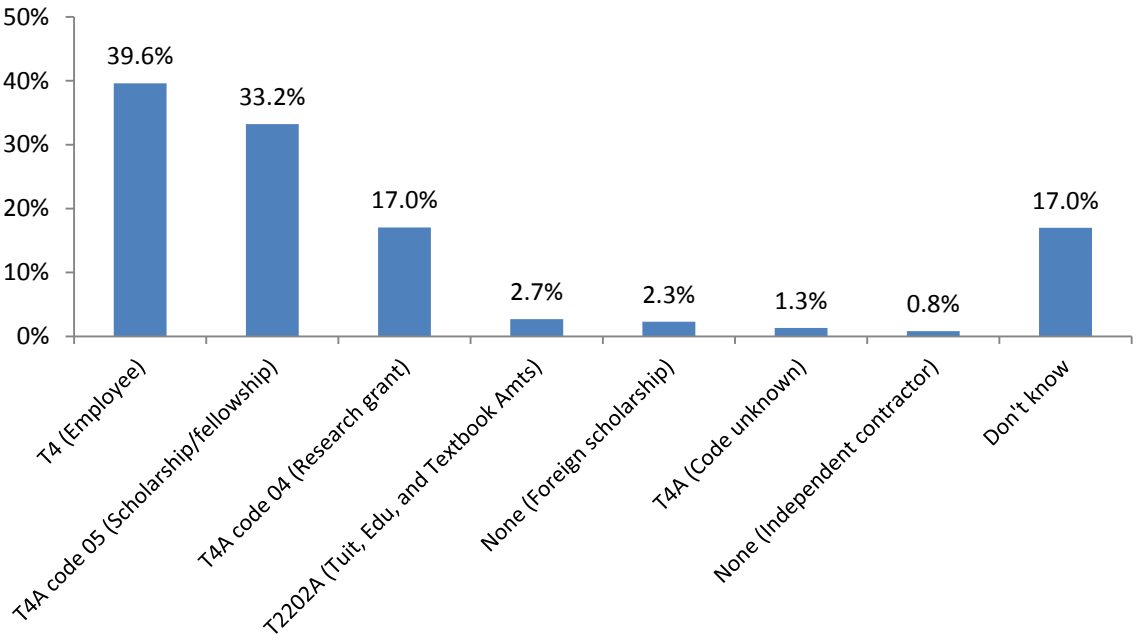
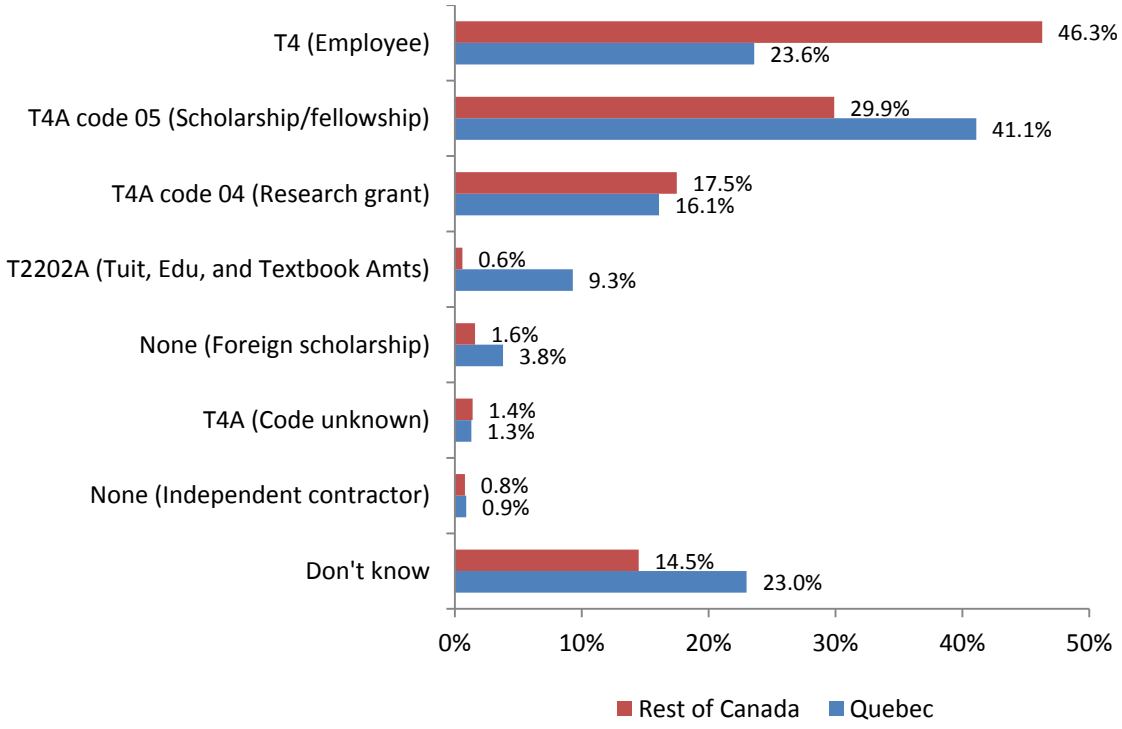



**Figure 8: Tax forms by region of residence**

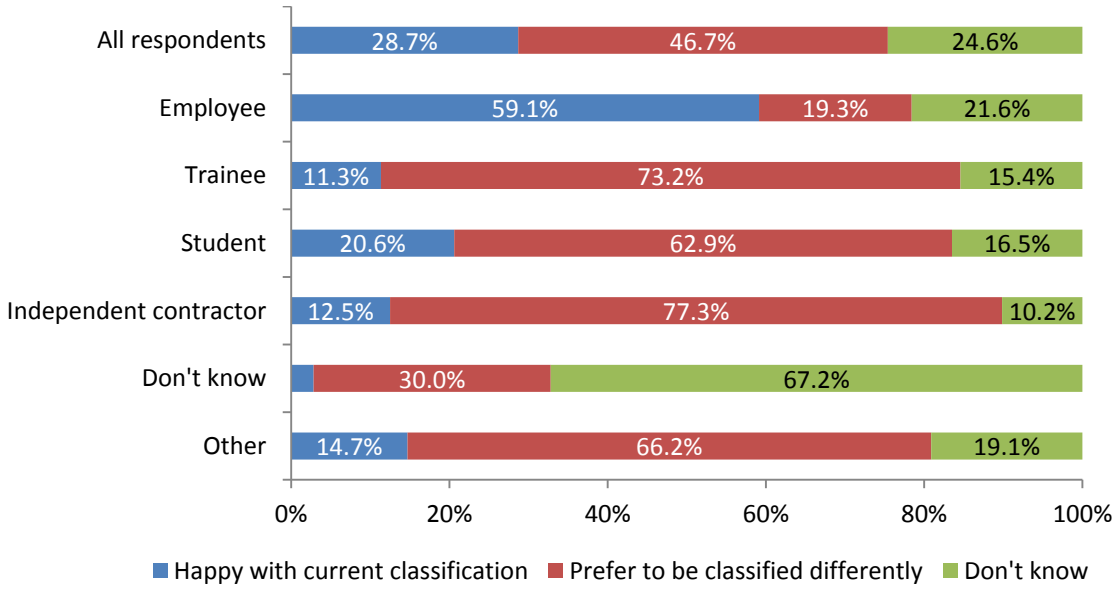


## Satisfaction and Preferred Classification

Many postdocs are unhappy with their current administrative classification (46.7%) (Figure 9). Concerns relating to the status of postdocs in Canada are also the strongest theme to emerge in postdocs' responses to open-ended questions.

Three-quarters of postdocs who have a classification preference[7] indicate that they would prefer to be classified as employees (Figure 10). This pattern is a marked shift from the preferences expressed by respondents in CAPS-ACSP's 2009 survey, in which respondents' preferences for "employee" and "trainee" status were more evenly split (CAPS-ACSP 2009). The intervening four years have seen the 2010 clarification of postdocs' federal income tax status, discussions surrounding local unionization drives, provincial labour board rulings, and shifts to employee status at a number of Canadian universities.

**Figure 9: Satisfaction with current classification by current classification**

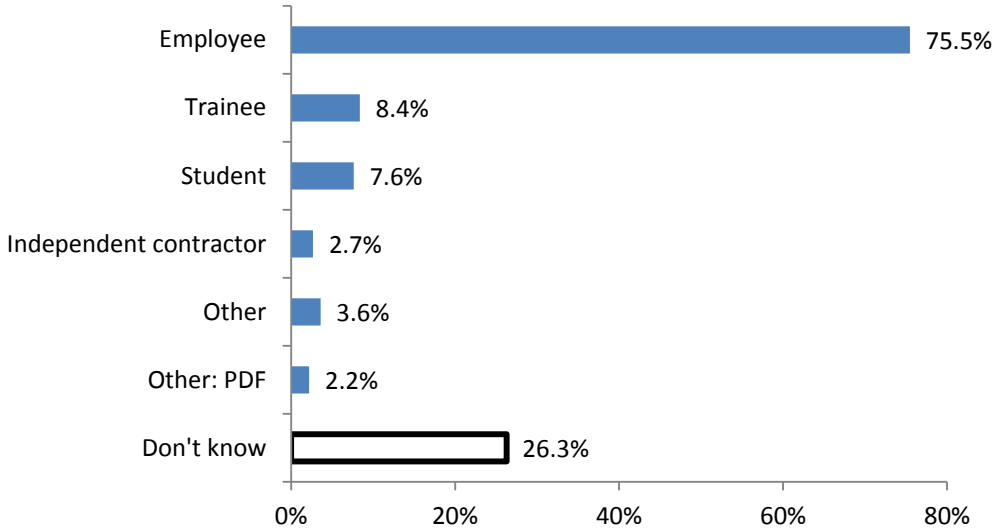



When postdocs were asked to explain their classification preference, their responses emphasize the rights and benefits that are associated with different classification options. Respondents mention access to EI, CPP, and maternity leave as reasons why they would like to be classified as employees. Respondents also express a desire to simply have a clear definition of their status. A number of respondents comment that, because they do not have a defined status, they are unable to access resources at their institution, i.e., because they are not considered students, they cannot access student benefits, and because they are not staff or faculty members they are not eligible for employee benefits and cannot access their institution's human resources unit. There is also a sense among some that being called a trainee is insulting given their level of experience and expertise.

[7] Frequencies for each classification preference are calculated using the responses of the 1379 postdocs expressed a classification preference, i.e., who responded "yes" or "no" to the question "Would you prefer that your university/institution classify your postdoctoral position differently?" Postdocs who responded "don't know" were excluded from the calculation in Appendix 3.

A clear administrative status would also provide a foundation for organizing oversight of postdoc supervision. Although the survey questions do not explicitly address this issue, perceived exploitation of postdocs by their supervisors was a common theme in the responses to open-ended questions. These respondents wrote of the need for clearly defined expectations, roles, and responsibilities for postdocs and their supervisors.

**Figure 10: Preferred classification**



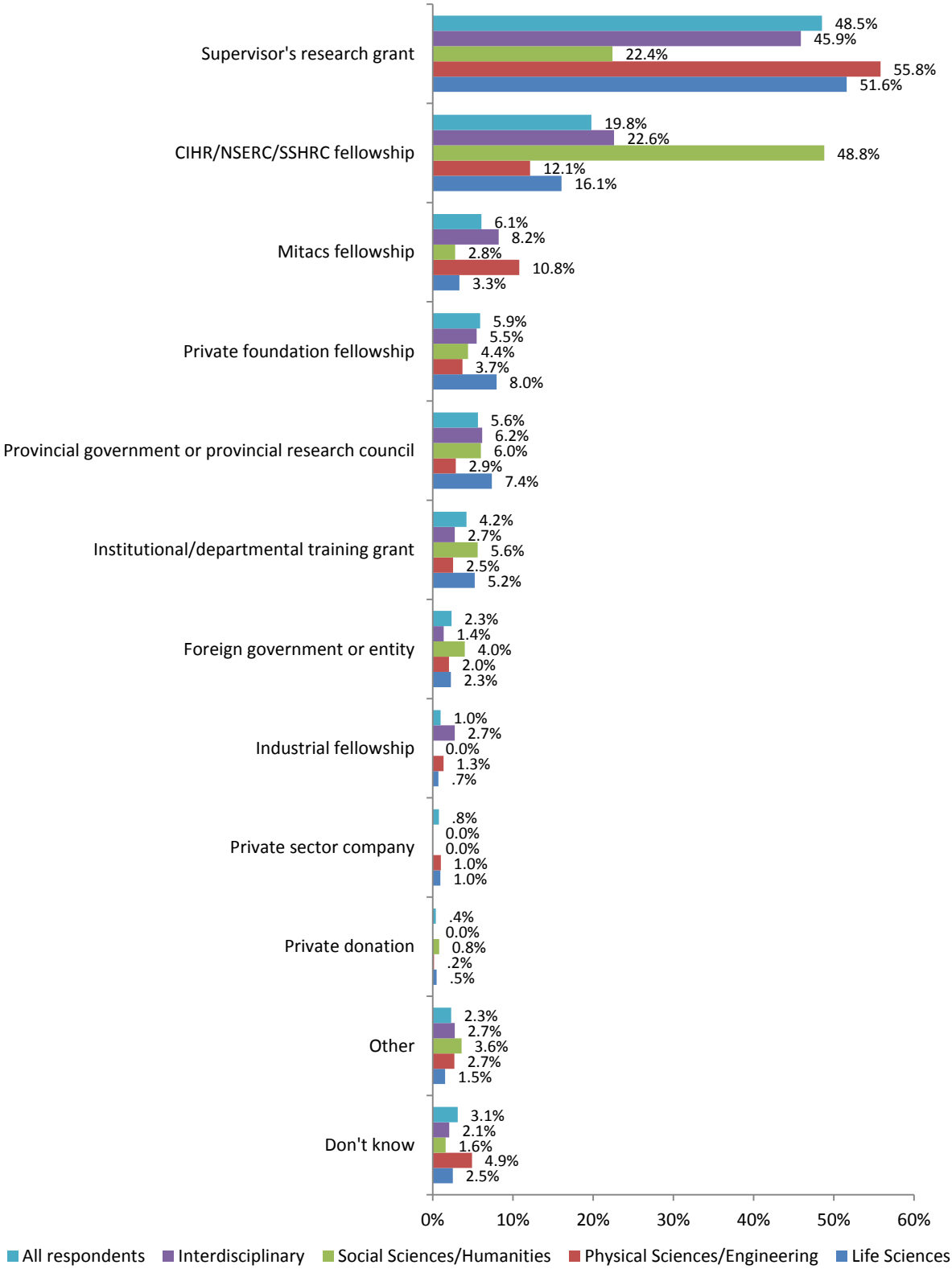

Note: Percentages shown for each classification exclude the "don't know". The percentage for "don't know" is of all respondents.

The magnitude of the preference for employee classification varies regionally and across research disciplines. For example, postdocs in Quebec are more likely than those in the rest of Canada to prefer to be classified as students (18.2% vs. 4.1%, respectively), and Physical Sciences/Engineering postdocs are more likely than postdocs in other fields to prefer an employee classification (81.6% vs. 72.6%, respectively). Out-of-country postdocs are more likely than postdocs in Canada to prefer “other” classifications (23.4% vs. 5.2%, respectively), and less likely to prefer employee status (55.3% vs. 76.2%, respectively). A more detailed summary of these patterns is presented in Appendix 3. Despite these quantitative differences, the overall preference for employee status is consistent.

## Compensation and Expenses

For approximately half of postdocs (48.5%), the primary source of funding is their supervisor’s research grant. This proportion is lower among Social Sciences/Humanities postdocs than others (22.4% vs. 52.7%, respectively) (Figure 11). CIHR/NSERC/SSHRC fellowships are the second most commonly reported source of funding (19.8% of all respondents). While supervisor research grants may derive from a range of sources, it is likely that the Tri-Council funding agencies are also a significant contributor to research grant funding. The Tri-Council funding agencies are therefore in a strong position to provide leadership in establishing postdoctoral standards, such as revising postdoc administration and setting benchmark levels of compensation and benefits.

**Figure 11: Primary source of funding for salary/stipend by field of research**



Gross annual salary or stipend (before taxes or other deductions) is shown in Figure 12. Compensation varies widely; at the low end, real income is lower than for many graduate students, while at the top end, postdoctoral compensation may exceed starting faculty salaries. Nearly two-thirds of postdocs earn less than $45,000 per year (64.5%). The estimated mean salary/stipend is $43,973.[8] Compared to the 2009 CAPS-ACSP survey, there has been a modest increase in postdoc salaries. The mean gross salary reported in 2009 was roughly $40,000, compared to $44,000 in 2013. Given the 2010 clarification that postdoc stipends are not tax-exempt, it is unclear whether these gains have translated into real, net income increases (cf., Marche 2010).

Salary/stipend[9] varies with respondent characteristics. For example, respondents who are completing their second postdoc have slightly higher mean salaries than those completing their first postdoc. Postdocs in the Social Sciences/Humanities have lower mean salaries than those in other fields, and postdocs in B.C., Ontario, and the Prairies report higher salaries than those in Quebec. Postdocs funded by a private foundation/association or by a Tri-Council fellowship have higher mean salaries than those funded by their supervisor's research grants. These patterns are described in Appendix 4.

Many respondents used the survey's open-ended comment box to express dissatisfaction with salary or stipend values. These respondents often wrote of the particular financial hardship faced by postdocs with children. Concerns are often also connected to the broader issue of postdoctoral status and taxation.

To better understand the financial picture among postdocs, respondents were also asked to estimate their approximate monthly living expenses (Figure 13) and educational debt (Figure 14). Using the mid-point of each expense category, the average monthly household living expenses reported by postdocs is $2,345.27. Those who are married/common-law have higher monthly household living expenses than those who are single ($2,551.53 vs. $1,867.27, respectively), and those with dependent children have the highest expenses of all ($2,889.24).

Close to two-thirds of postdocs do not have educational debt (65.4%). This figure is much higher among international postdocs holding a work permit (73.0%) and immigrants (71.1%) than Canadian citizens (57.6%). Among those who do have educational debt, most have less than $20,000. However, a sizable proportion (9.9% of all respondents) has debt of $20,000 to $39,999.

[8] The mean annual salary/stipend is estimated from the reported income bracket frequencies by assuming $20,000 as the average within the lowermost ($24,999 or less) income range, $85,000 within the uppermost ($80,000 or more) range, and using the mid-point for all other income ranges.

[9] A semantic consequence of inconsistent employment status is that postdocs who are classified as employees earn a "salary," whereas non-employee postdocs receive a "stipend". For simplicity, we use "salary" for both forms of remuneration.

**Figure 12: Gross annual salary/stipend**

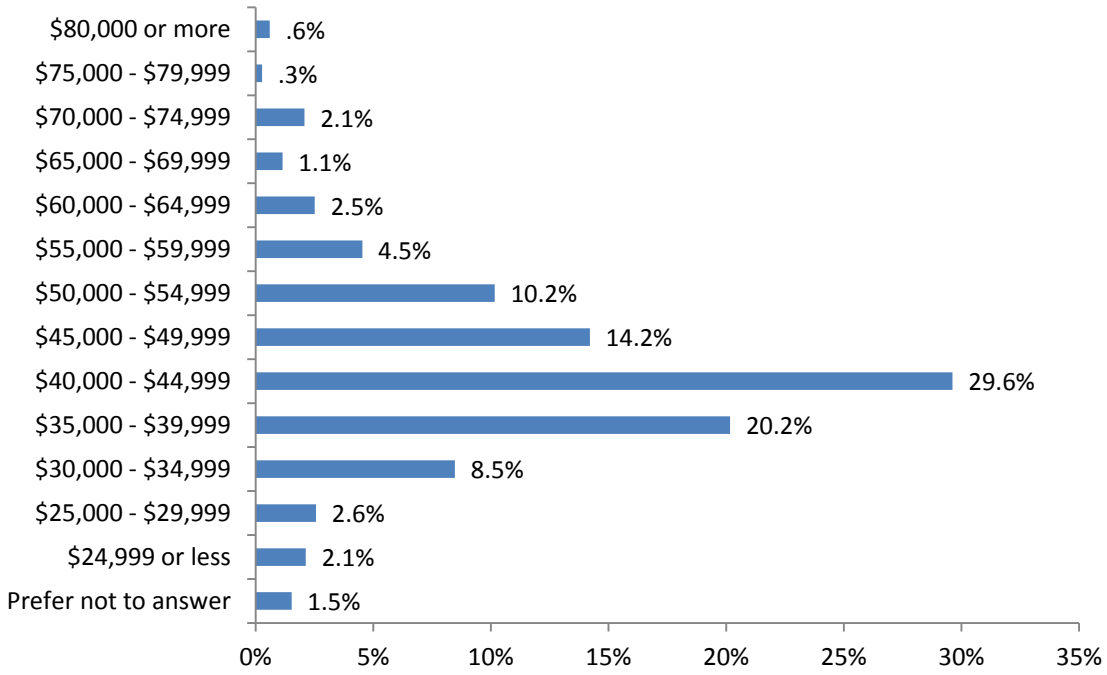



**Figure 13: Monthly living expenses**

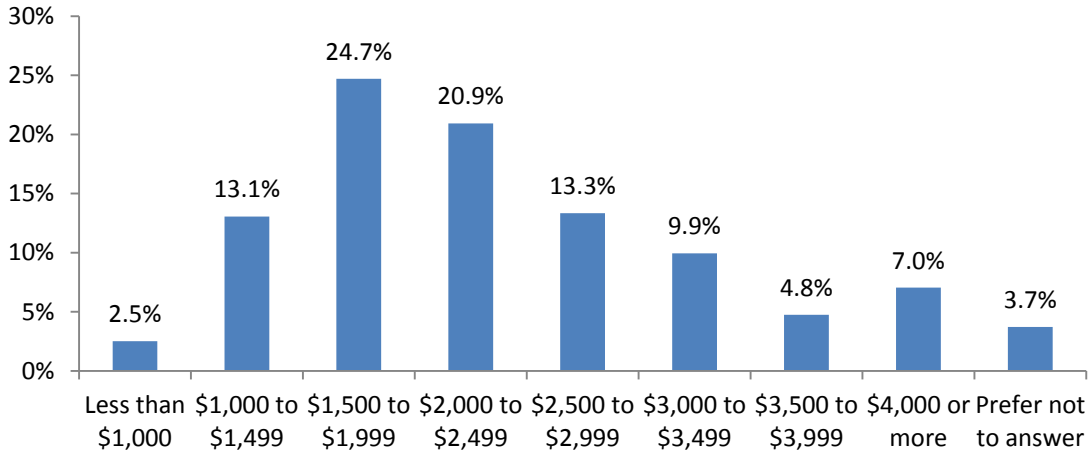
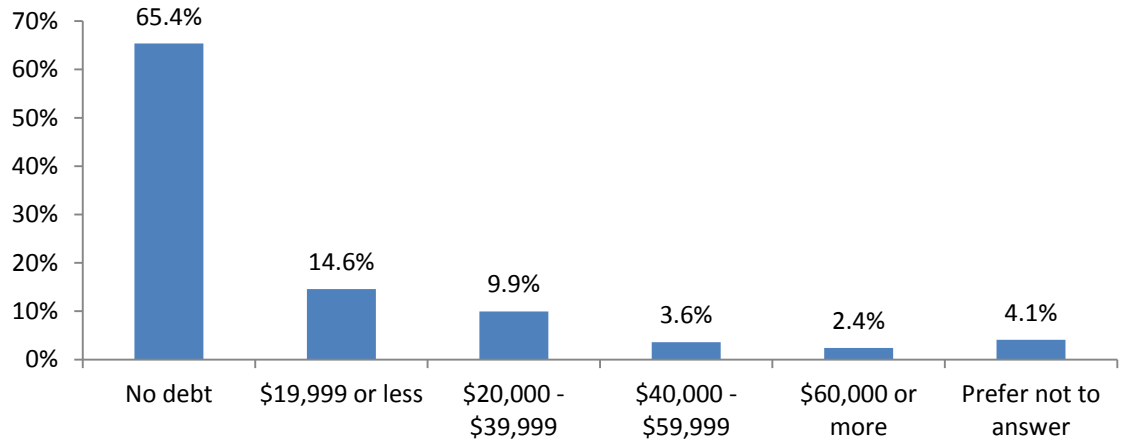


**Figure 14: Educational debt**




## Benefits

An important part of any compensation package is the benefits that are available. For most postdocs, the compensation package includes few additional benefits (Figure 15). Just over two-thirds of postdocs report that personal health insurance is available to them (67.9%)[10], and only half have access to dental insurance (51.2%), vacation leave (48.0%) or family health coverage (46.8%). Just over one-quarter of respondents indicate that they also have access to benefits through a spouse or partner (28.1%).

As shown in Figure 16, the most sought after benefits are health insurance (54.3%) and dental insurance (50.5%). In addition, 39.3% of respondents who do not have EI rate this as one of the top three benefits they would like to see implemented.

Ambiguity over employment status also leads to ambiguity over the responsibility for benefit premiums. Postdocs with EI/CPP or an extended health plan were asked who paid those premiums. Responses to these questions are summarized in Appendix 5.

As with salary/stipend values, many respondents used the open-ended comment box to complain that, despite paying the same taxes at a regular employee, they are not receiving the corresponding benefits. Respondents also wrote of the financial hardship of having a child as a postdoc without benefits.

[10] It is possible that some respondents did not make a distinction between provincially administered "basic" health coverage and the "extended" health insurance plans that are available to some postdocs either as a negotiated employee benefit, or through student society or postdoc association health plans. While the exact percentages may be uncertain, the overall pattern of responses suggests that many postdocs do not have access to an extended health insurance plan through their postdoctoral appointment.

**Figure 15: Benefits available through postdoctoral position**

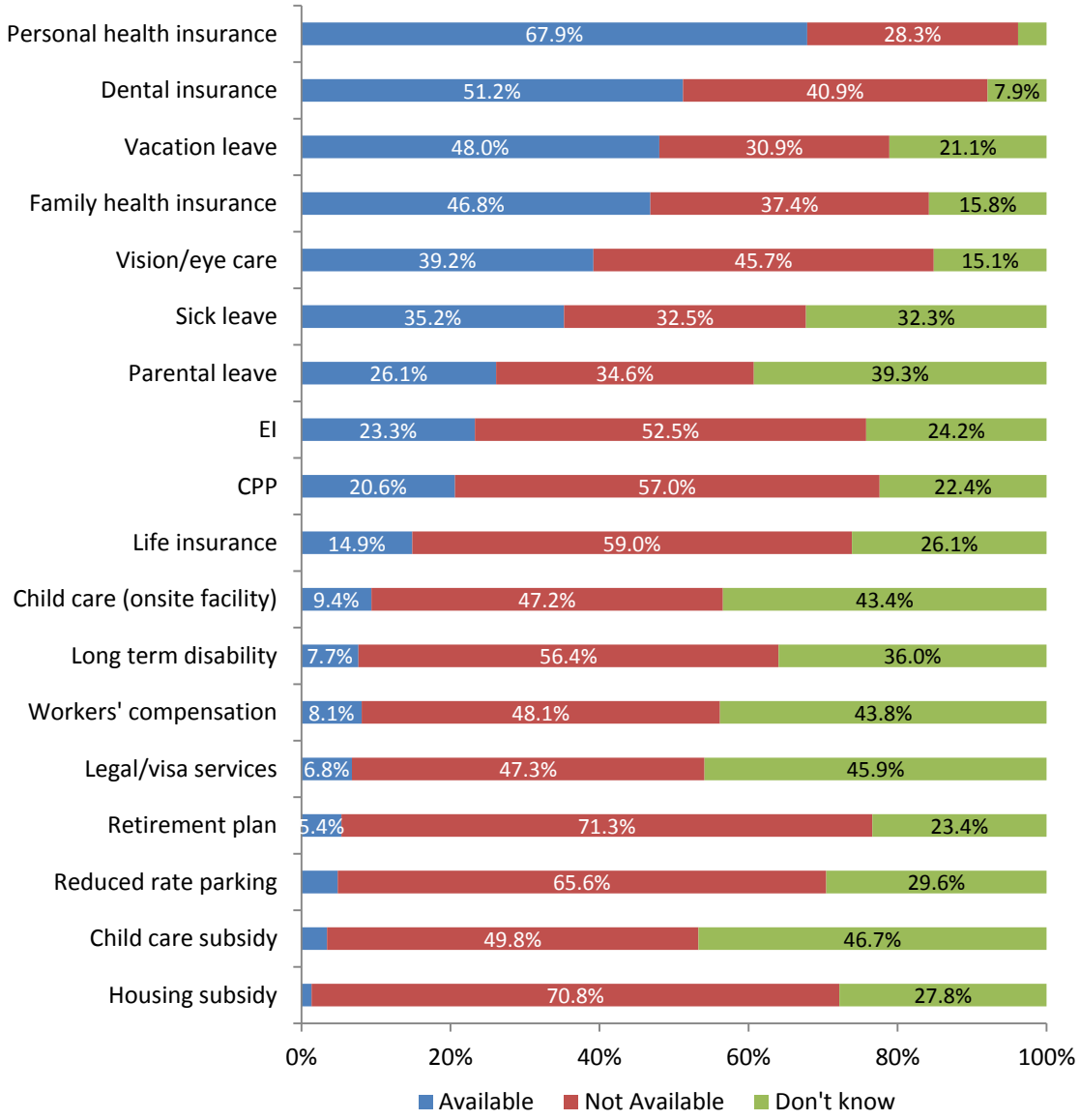
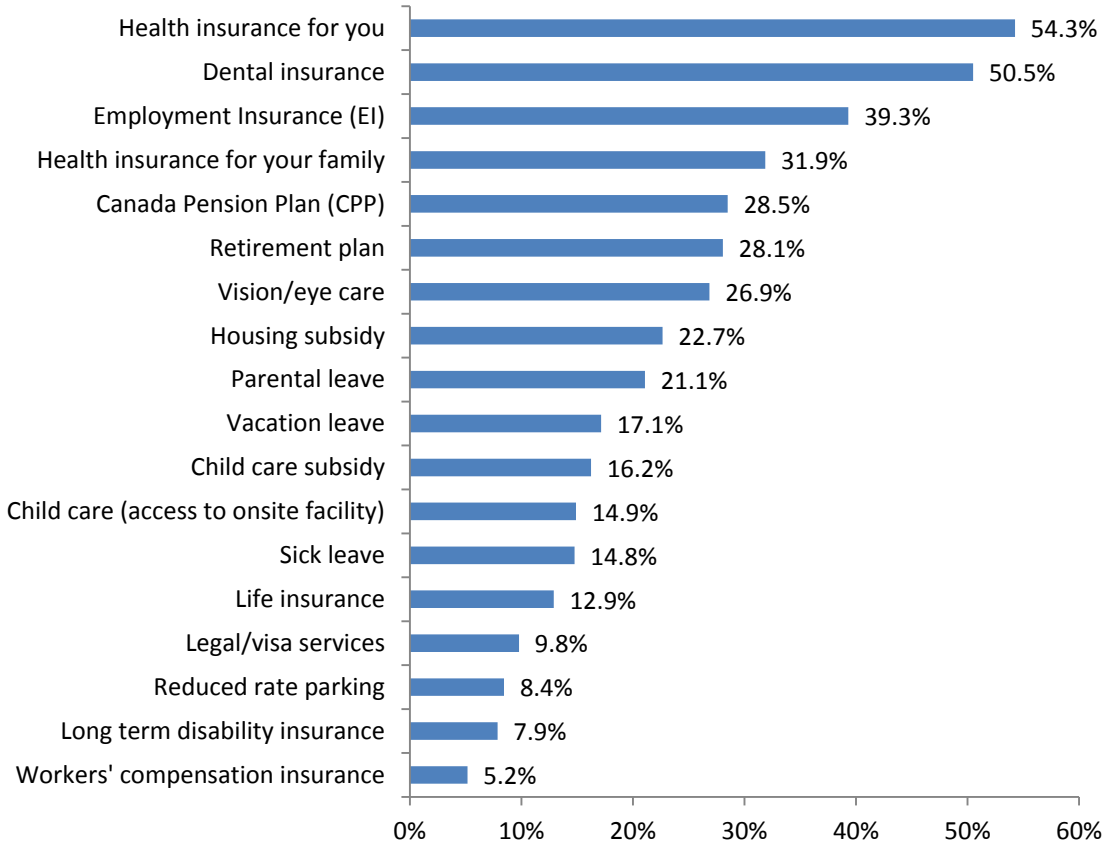


**Figure 16: Top benefits desired among those without access or who do not know if they have access[11]**




[11]To determine which benefits are most in-demand among postdocs, respondents were shown the same list of benefits used in Figure 15 but excluding benefits that they had indicated are already available to them. Respondents were asked to select the top three benefits that they would like to see implemented. Figure 16 presents the proportion of respondents who rate each benefit as one of their top three among those who did not have access or did not know if they have access to each.

# III. Training, Professional Development and Career Options

> ***I consider myself one of the lucky few. Overall, my postdoctoral experiences have been excellent. However, despite being in a great postdoctoral position, the hard reality is that the number of jobs out there in academic positions as well as non-academic positions is still low in comparison to the number of PhDs being churned out.***
>
> ***—Survey Respondent***

Training is a fundamental aspect of a postdoctoral appointment. Most definitions, including the definition used by CAPS-ACSP, state that a postdoctoral appointment is intended to provide training. Indeed, as noted above, many universities formally classify their postdocs as trainees. In a university setting, training is arguably the only real distinction between a postdoctoral scholar and a research associate. The 2013 Canadian Postdoc Survey devotes considerable attention to characterizing the training available to Canadian postdocs and the fit between postdocs' training and their career aspirations.

Most of the training and career direction concerns outlined below relate to "academic tunnel vision". Assuming that there is no significant change in either the number of openings for new faculty or the number of postdocs, most Canadian postdocs will not become university research faculty. But, if postdocs are encouraged to view academia as the only acceptable career direction, and if postdoctoral training reflects that focus, then training designed to help postdocs acquire the professional skills needed to succeed in non-academic settings will continue to be neglected.

## Career Goals

Prior to beginning their current postdoctoral position, the majority of respondents state that their goal was to be university research faculty members (80.5%) (

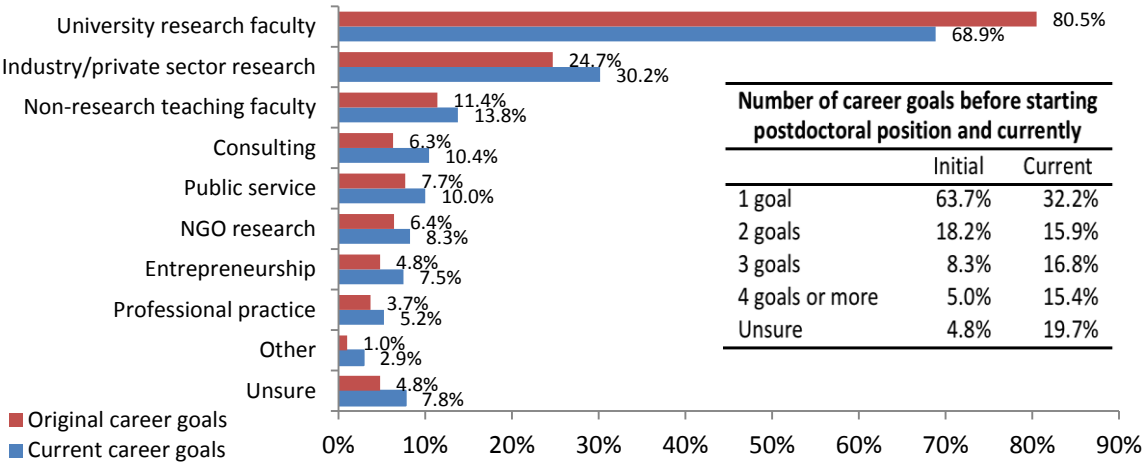
Figure 17). Thus, given the limited number of new faculty openings, many Canadian postdocs are taking up their appointments with unrealistic career goals. Nearly one-quarter of respondents state that their career goals have changed since starting their current postdoc position (23.1%). Overall, the proportion of postdocs aspiring to university research faculty positions declines while the proportion aspiring to every other career goal increases marginally and, for many respondents, the number of careers being considered increases. Not surprisingly, the most common explanation for revised career goals is an unfavourable job market (

Figure 18).

Among the subset of respondents whose career goals changed, the most common new goal is a career in industry or the private sector (43.6%). However, university research faculty is the next most common (28.9%), and it remains the dominant career goal overall[12].

[12]Patterns of variation associated with career goals and career goal changes are presented in more detail in Appendix 6 and Appendix 7.

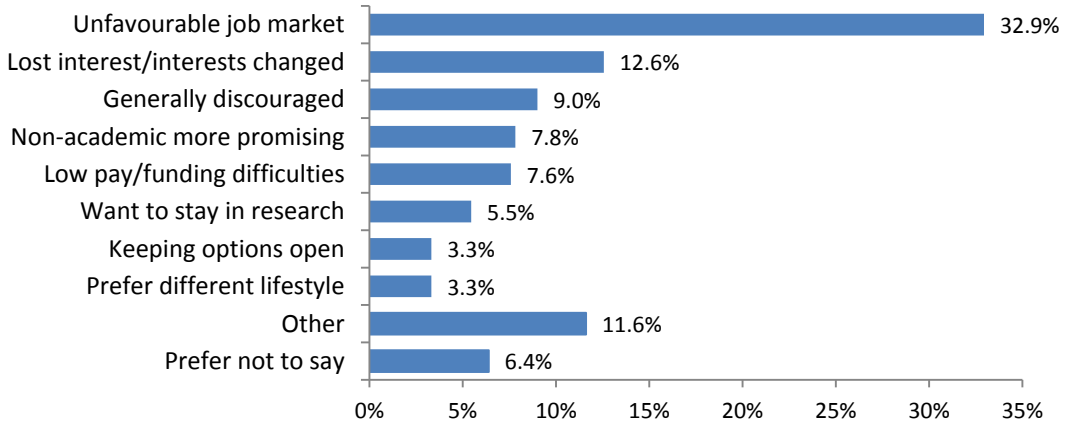
**Figure 17: Change in career goals before and after starting postdoc (multiple response)[13]**




**Number of career goals before starting postdoctoral position and currently**

| | Initial | Current |
|---|---|---|
| 1 goal | 63.7% | 32.2% |
| 2 goals | 18.2% | 15.9% |
| 3 goals | 8.3% | 16.8% |
| 4 goals or more | 5.0% | 15.4% |
| Unsure | 4.8% | 19.7% |

**Figure 18: Reasons for changed goals (coded from open-ended responses) (n=422)**




[13]Current career goals combines the new career goals for those whose goals have changed (n=422) with the original career goals of those whose goals have not changed.

## Available Training

Respondents were asked if they received any formal or informal training during their current postdoctoral position (Table 3). Many have received limited training or none: over half of respondents (56.6%) report receiving no formal training in any of categories that are listed in Table 3. Indeed, one-third (33.8%) have received no training, either formal or informal, in any of Table 3's categories. Training may be unavailable, postdocs may be unaware of training opportunities, or postdocs may not take advantage of those opportunities. In each case, the consequence is that the postdoctoral appointment does not deliver the tools that the postdoc will need to secure and succeed in their future career.

**Table 3: Level of training received or available[14] (percent)**

| Training Type | Received formal training | Received informal training | Training available but not taken | Training not available | Don't know |
|---|---|---|---|---|---|
| **Career development** | 17.9 | 13.2 | 28.6 | 21.4 | 19.8 |
| **Research ethics** | 15.0 | 15.4 | 16.6 | 22.0 | 31.5 |
| **Teaching skills** | 13.3 | 13.9 | 22.8 | 29.7 | 20.8 |
| **Presentation skills** | 11.3 | 25.6 | 19.3 | 21.5 | 22.8 |
| **Grant or proposal writing** | 10.6 | 23.6 | 19.2 | 25.1 | 22.2 |
| **Project management** | 9.5 | 18.1 | 12.2 | 28.9 | 31.6 |
| **Writing skills** | 8.4 | 21.3 | 23.3 | 22.8 | 24.6 |
| **Intellectual property** | 6.8 | 8.6 | 15.2 | 29.3 | 40.3 |
| **Group or lab management** | 5.7 | 19.1 | 8.5 | 32.7 | 34.3 |
| **English language skills** | 4.9 | 9.3 | 18.1 | 27.3 | 40.6 |
| **Conflict resolution skills** | 4.3 | 7.4 | 12.4 | 34.9 | 41.1 |
| **Negotiating skills** | 3.5 | 6.8 | 10.3 | 39.2 | 40.2 |
| **French language skills** | 2.7 | 1.2 | 9.3 | 45.4 | 41.4 |

## Postdoc-Specific and External Training

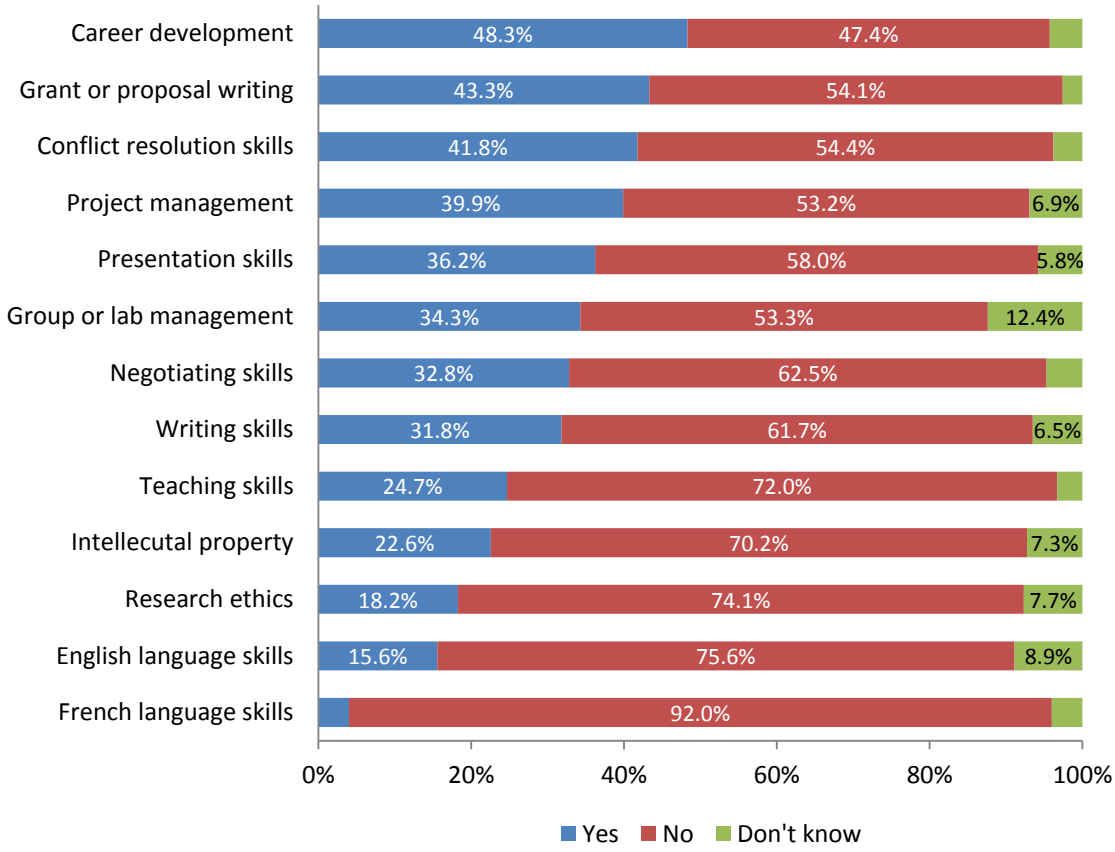
The minority of respondents who do receive formal training were asked if that training is designed specifically for postdocs (Figure 19). In most cases it is not, i.e., postdocs are instead permitted to access training programs that are designed for other members of the research community—typically graduate students or junior faculty. Postdocs are not graduate students and, as discussed above, most will not become university faculty.

At first glance, it is promising to see that roughly half of those who receive formal training in career development receive training that is specifically designed for postdoctoral scholars (48.3%). However, since only 17.9% of postdocs receive formal career development training at all, this result indicates that only 8.6% of Canadian postdocs receive postdoc-specific career development training. For all other formal training categories, the corresponding frequencies are lower still.

[14] Variation in formal training received across fields of research is summarized in Appendix 8.

Most respondents (79.9%) have not participated in externally administered professional development training during their current postdoctoral appointment. Those in Life Sciences are more likely than those in Physical Sciences/Engineering to have participated in external training (22.5% vs. 15.0%, respectively). Among those who participate in an external training opportunity, 20.1% take part in Mitacs training.

**Figure 19: Formal training received specifically for postdoctoral scholars**



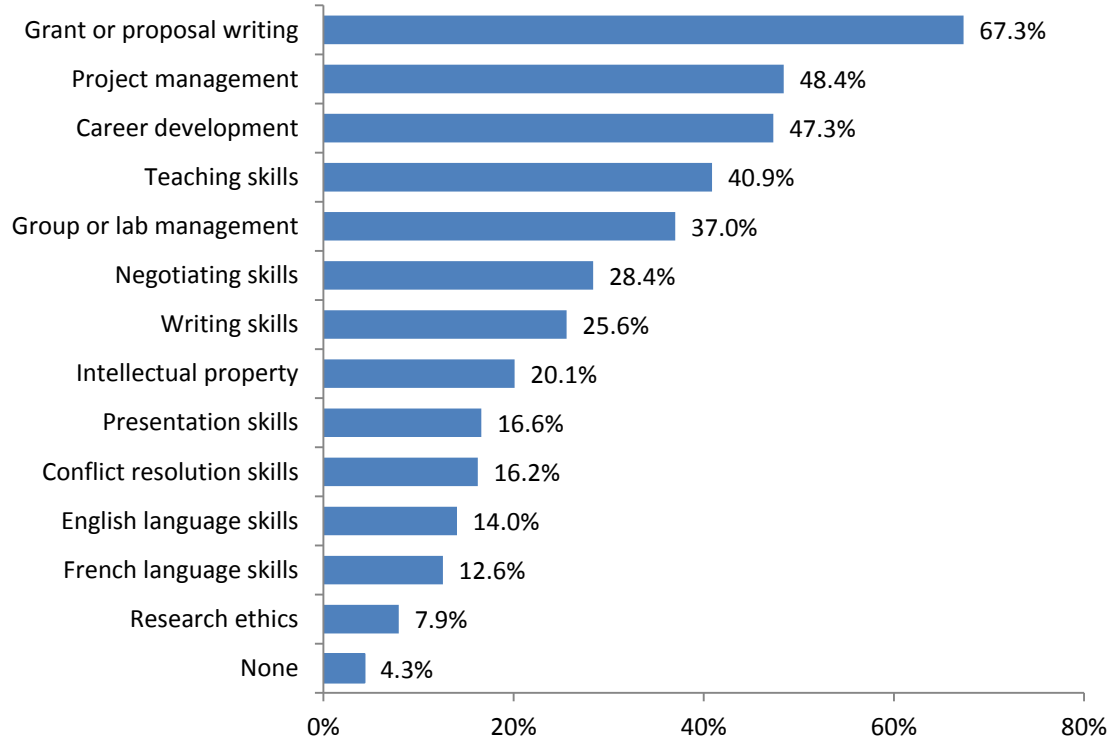
## Interest in Formal Professional Development Training

Postdocs were asked whether they are interested in training. Postdocs' interests in formal professional development training are informative for two reasons. First, they are a direct message to Canadian institutions and external agencies: the number of postdocs who are interested in formal training far exceeds the number currently receiving that training (Table 3 vs. Figure 20).

More subtly, specific training interests offer an indirect insight into postdocs' career aspirations. Respondents who aspire to university research faculty positions are more interested in receiving training in grant or proposal writing and teaching skills, while those pursuing industry/private sector careers are more interested in project management training (Table 4).

These patterns should not be interpreted as a recommendation to tailor training to postdocs' current career interests. As discussed above, many postdocs will not realize their initial career aspirations or will find that their career goals change over the course of their postdoctoral appointment.

**Figure 20: Interest in formal professional development training[15]**




[15]Interest in formal professional development training by field of research is presented in Appendix 9.

**Table 4: Interest in formal professional development training by career goal among those with a single goal[16] (percent)**

| | University research faculty | Industry/ private sector | Other | Unsure |
|---|---|---|---|---|
| *n (1,174)* | *759* | *139* | *134* | *142* |
| **Research ethics** | 7.6 | 9.4 | 6.0 | 7.7 |
| **Writing skills** | 27.5 | 21.6 | 32.8 | 22.5 |
| **Presentation skills** | 16.6 | 21.6 | 19.4 | 19.0 |
| **Teaching skills** | 42.8 | 28.1 | 32.1 | 41.5 |
| **Grant or proposal writing** | 72.9 | 48.9 | 57.5 | 59.9 |
| **Group or lab management** | 34.1 | 39.6 | 37.3 | 45.1 |
| **Project management** | 40.6 | 53.2 | 47.8 | 56.3 |
| **Negotiating skills** | 23.8 | 32.4 | 34.3 | 28.9 |
| **Intellectual property** | 17.4 | 24.5 | 18.7 | 19.7 |
| **Conflict resolution skills** | 12.6 | 18.7 | 19.4 | 19.0 |
| **English language skills** | 15.0 | 20.1 | 14.2 | 12.0 |
| **French language skills** | 11.1 | 13.7 | 11.2 | 14.1 |
| **Career development** | 45.2 | 56.8 | 46.3 | 51.4 |
| **None** | 4.9 | 4.3 | 4.5 | 5.6 |

## Non-academic Career Options

Most respondents have not been exposed to non-academic career opportunities during their current postdoctoral position (50.9%), and only 7.7% have "a lot" of exposure (

[16] To examine differences by career aspirations a variable was created to reflect current career goals for those who have a singular career goal. All respondents who have multiple career goals are excluded from the analysis presented in this table.

Table 5). Postdocs in Physical Sciences/Engineering or in an Interdisciplinary field are more likely than others to have been exposed to non-academic career options.

In addition, only 12.9% of postdocs report having access to a career counsellor; 36.6% have no access to career counselling and 50.5% did not know. Thus, the vast majority of postdocs are proceeding without any formal guidance as to their career opportunities. The vast majority (84.2%) of respondents are interested in learning more about non-academic career opportunities.

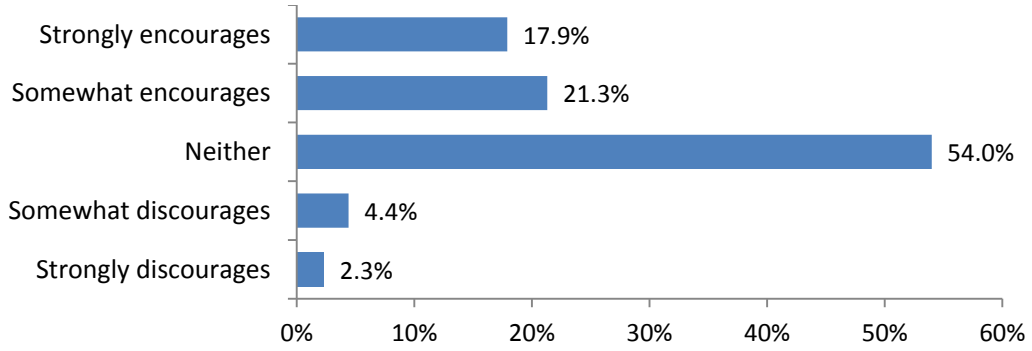
**Table 5: Extent of exposure to non-academic career opportunities by field of research**

| | Life Sciences | Physical Sciences/ Engineering | Social Sciences/ Humanities | Interdisciplinary | All Fields |
|---|---|---|---|---|---|
| *n* | *841* | *593* | *250* | *146* | *1,820* |
| **A lot** | 5.9% | 11.0% | 3.2% | 12.3% | 7.7% |
| **Somewhat** | 37.5% | 47.2% | 35.6% | 50.0% | 41.4% |
| **Not at all** | 56.6% | 41.8% | 61.2% | 37.7% | 50.9% |

## Encouragement to Pursue Training and Career Preparation

From the responses summarized in Table 3, it is evident that many postdocs are not taking advantage of existing training opportunities. While the responsibility for this decision rests ultimately with the postdoc, supervisors do have a responsibility to facilitate and, as mentors, to encourage postdocs to seek out training opportunities. As shown in Figure 21, only 39.2% of respondents are encouraged to pursue professional development training by their advisors while 54.0% are neither encouraged nor discouraged.

**Figure 21: Level of encouragement from postdoctoral advisor to pursue professional development training**




## Satisfaction with Professional Development and Career Opportunities

Over half of respondents are not satisfied with their career options (56.1%). Physical Sciences/Engineering postdocs are more likely than those in Life Sciences and Social Sciences/Humanities to be satisfied (54.0% vs. 38.8% and 35.2%, respectively). Men are more likely to be satisfied than women (48.9% vs. 38.4%) and international postdocs are more likely to be satisfied than Canadian citizens and immigrants (55.5% vs. 35.7% and 40.0%, respectively). These and other patterns of satisfaction with career options are summarized in Appendix 10.

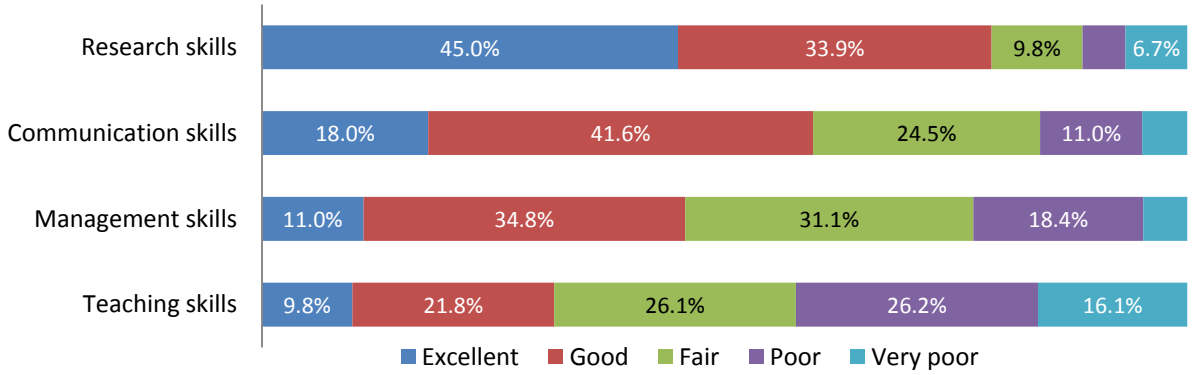
When asked to rate the quality of their current postdoctoral experience in preparing them for their future career, respondents rate the quality of their research skills training the highest (78.9% rate the quality as either good or excellent) (Figure 22). Quality ratings in relation to communication skills and management skills are mixed, whereas the majority of respondents rate the quality of their teaching skills preparation as fair, poor, or very poor (68.4%). It bears mention that respondents are evaluating their postdoctoral experience as preparation for their current career goal, a goal that may be very different from their actual career path.

Many respondents used the open-ended comments sections to express unhappiness with the oversupply of doctoral graduates relative to faculty openings, and the limited resources available to support transitions to non-academic careers. These responses express a sense that the low likelihood of an academic career should

have been made clearer to them, not just before their postdoctoral appointment began, but before they enrolled as doctoral students.

> ***The lack of visible and effective career counseling, and the implicit message in academia that non-academic careers mean selling out or failing, was very unsatisfactory to me. I am now confident that I have made the right choice to pursue consulting, but I've received basically no support for doing so. [...] I would have loved to have realized earlier that this was an option for me! It would have relieved a lot of anxiety about my future.***
>
> ***I didn't receive nearly enough guidance about what other career options I had during my graduate or postdoctoral years. Given that faculty positions are scarce this should be mandatory for all postdocs.***
>
> ***—Survey Respondents***

**Figure 22: Quality of postdoctoral experience in preparing for career**



# IV. International Demographics and Mobility

Research communities are global. By encouraging international mobility, Canada accesses a broader, deeper pool of skilled researchers and encourages knowledge transmission and the formation of new research networks and collaborations.

In order to better understand the needs of postdocs who are new to Canada, the 2013 Canadian Postdoc Survey looked specifically at this group: their origins and demographic characteristics, their reasons for pursuing a postdoctoral appointment in Canada, and the challenges associated with that decision. We also asked all postdocs whether they planned to remain in Canada.

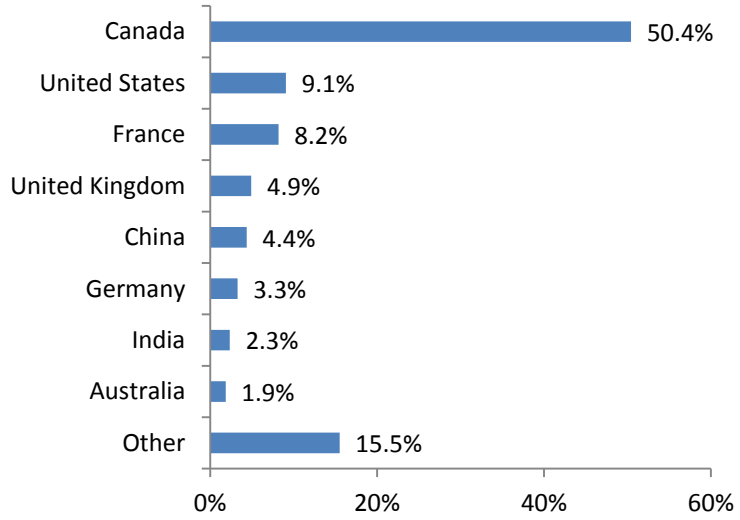
## International Demographics

The Canadian postdoc population is highly international. Just under half of respondents are Canadian citizens (46.9%), over one-third are international postdocs holding a work permit (37.7%), and the remainder held permanent resident/landed immigrant status (15.4%) (Table 6). Most respondents who are not Canadian citizens arrived in Canada relatively recently (55.7% arrived between 2011 and 2013). Half of respondents indicate that they completed their highest degree at a postsecondary institution outside of Canada (Figure 23). Fifty different countries were specified.

**Table 6: Citizenship**

| | | % | *n* |
|---|---|---|---|
| **Citizenship status** | Canadian citizen | 46.9 | *852* |
| | Permanent resident / landed immigrant | 15.4 | *280* |
| | International postdoc holding a work permit | 37.7 | *686* |
| | *Prefer not to answer* | | *12* |
| **Country of origin** | France | 13.3 | *127* |
| | China | 12.2 | *116* |
| | USA | 8.7 | *83* |
| | India | 7.9 | *75* |
| | Iran | 5.3 | *50* |
| | Germany | 5.1 | *49* |
| | United Kingdom | 4.5 | *43* |
| | Australia | 2.5 | *24* |
| | Brazil | 2.4 | *23* |
| | Italy | 2.2 | *21* |
| | Other | 35.8 | *341* |
| | *Prefer not to answer* | | *14* |
| **Year moved to Canada** | 2011 to 2013 | 55.7 | *535* |
| | 2008 to 2010 | 27.1 | *260* |
| | Prior to 2007 | 17.3 | *166* |
| | *Prefer not to answer* | | *5* |

**Figure 23: Country where highest level degree was completed (all respondents)**




## International Postdocs' Motivations and Challenges

The most common reasons for pursuing a postdoc in Canada are to learn new approaches, to take advantage of greater opportunities for research in the respondent's field, and to access future career opportunities (Figure 24).

**Figure 24: Reasons for pursuing a postdoctoral appointment in Canada**

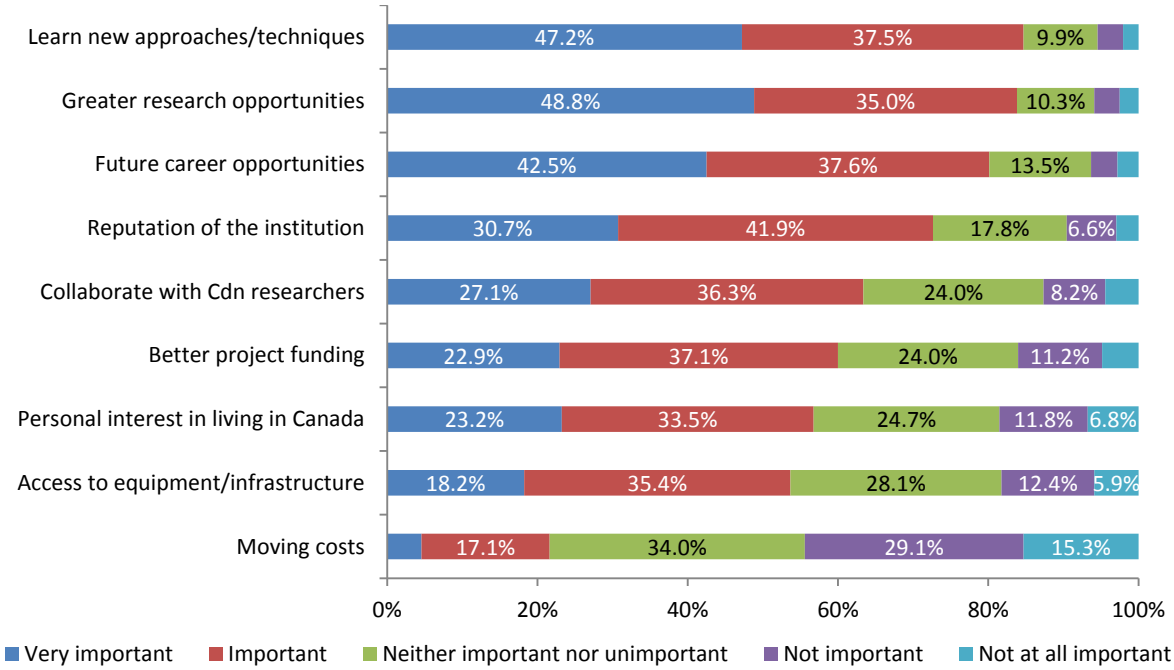
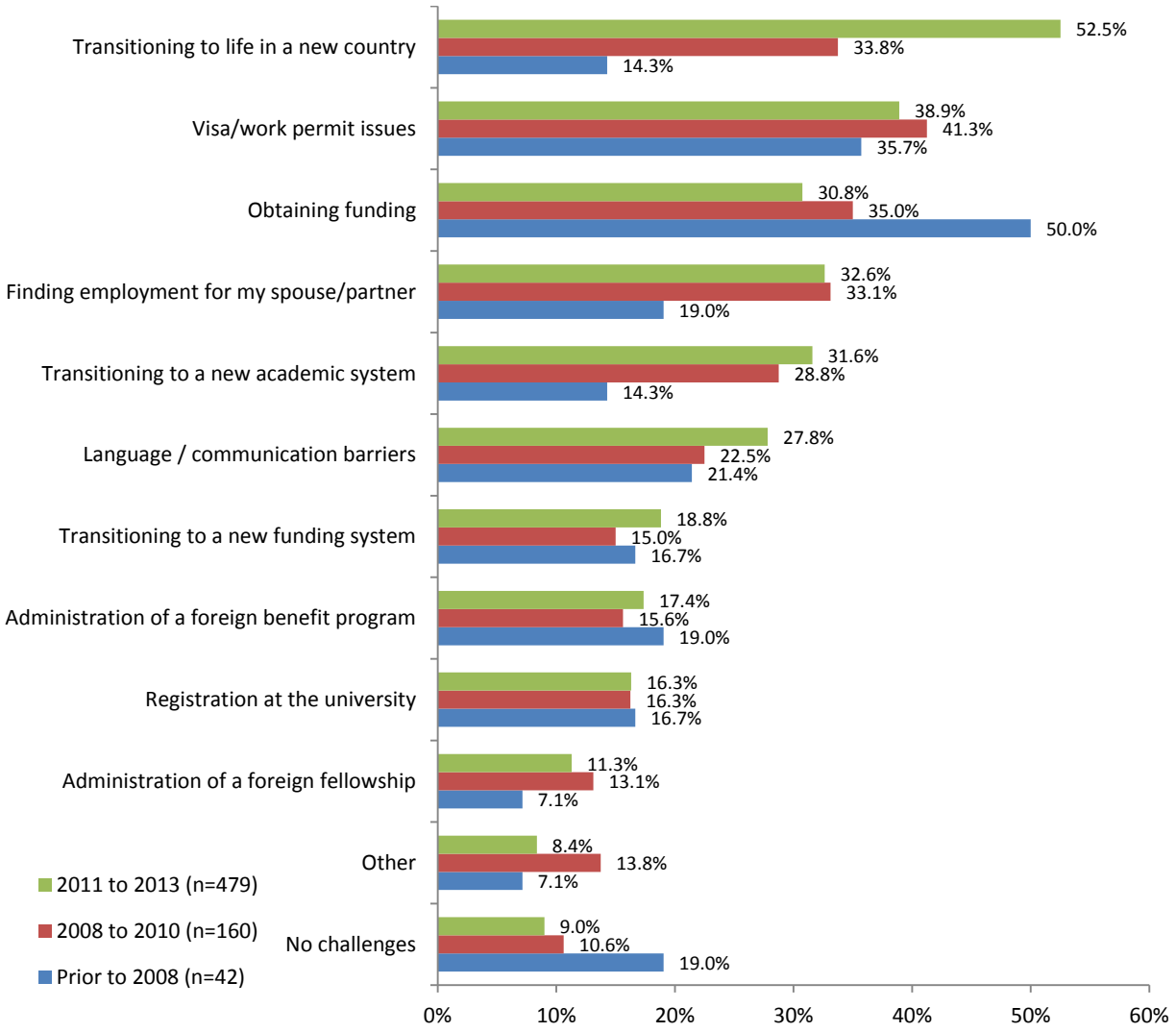


**Figure 25: Challenges experienced by international postdocs by year moved to Canada**




In addition to the concerns expressed by all Canadian postdocs, international postdocs experience additional challenges. Figure 25 presents the challenges most commonly experienced by international postdocs. Recent arrivals (those who came to Canada between 2011 and 2013) are much more likely to report that transitioning to life in a new country was a challenge (52.5%), while those who have been in Canada since 2007 or earlier are more likely to indicate that obtaining funding is a key challenge (50.0%). Visa and work permit issues are also commonly experienced challenges regardless of a postdoc's arrival date.

## Plans to Stay in/Leave Canada after Appointment

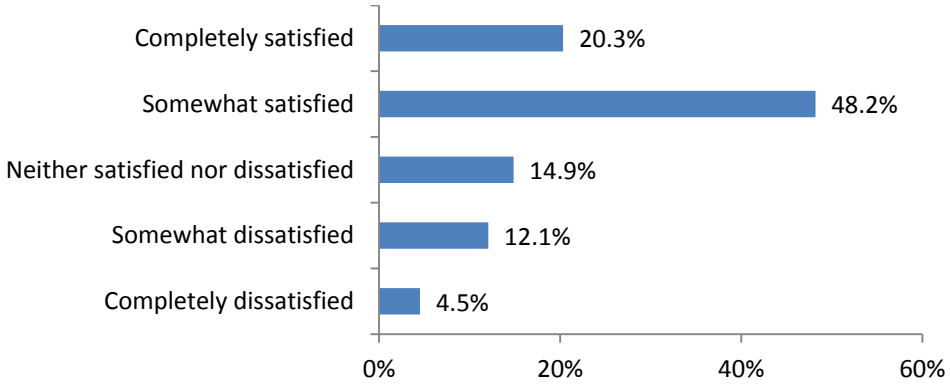
The international migration of highly-educated individuals has been described as "brain churn" rather than "brain drain", because much of the movement is temporary and opportunistic (Dion and Vézina 2010; Desjardins 2012.) The future plans of Canadian postdocs follow this pattern. Half of respondents (53.6%, international and Canadian combined) plan to stay in Canada after the completion of their postdoctoral position. Only 12.6% have definite plans to leave Canada, while the remainder are unsure (33.9%). The proportion of respondents planning to leave Canada after the completion of their postdoc is much higher among international postdocs holding a work permit than Canadian citizens or immigrants (25.5% vs. 5.0% and 3.2%, respectively).

Among international postdocs holding a work permit, plans to leave Canada are in order to return home, many for family reasons. Among Canadian immigrants and citizens who plan to leave, the overwhelming reason cited is the limited job opportunities available in Canada. Other reasons include wanting to live and work in a different country, a desire to gain international experience, and a dislike of the Canadian academic system.

## V. Satisfaction of Canadian Postdocs

Overall, most postdocs are at least somewhat satisfied with their postdoctoral experience to date (68.5%) (Figure 26). However, there is an alarmingly large proportion of postdocs who are ambivalent about or dissatisfied with their postdoctoral experience (31.5%).

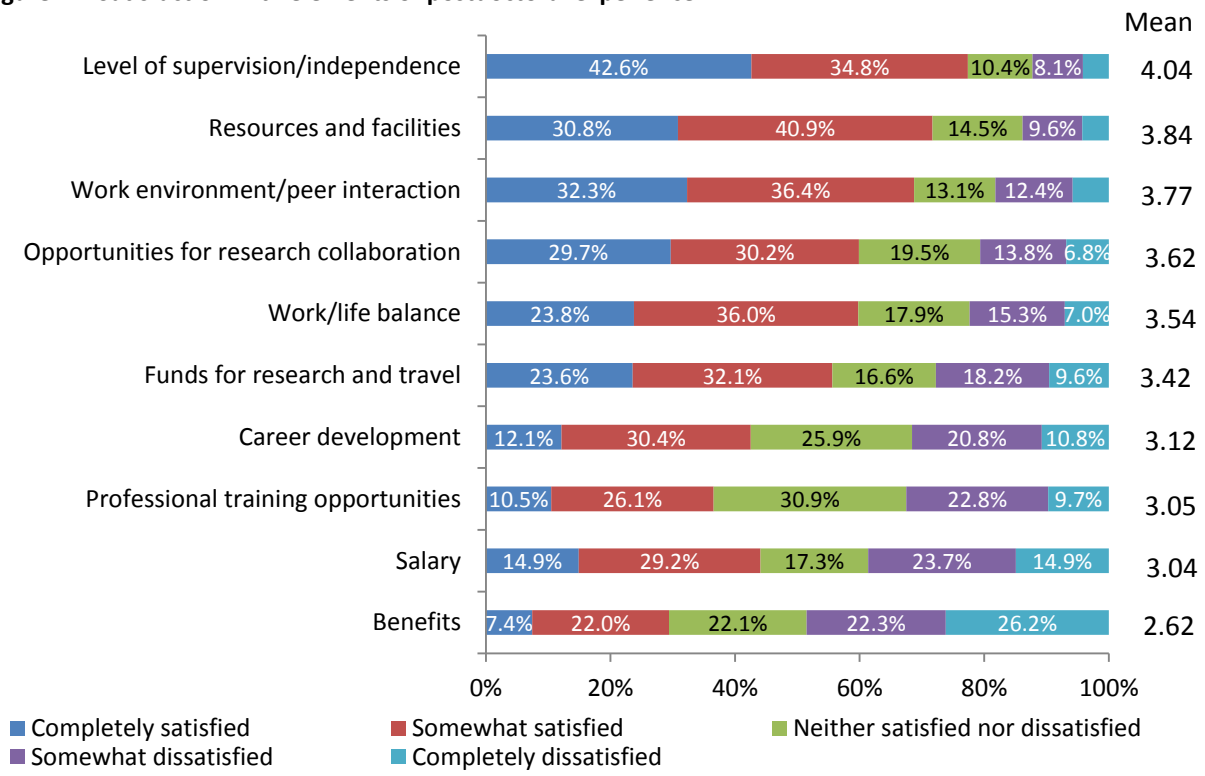
**Figure 26: Overall satisfaction with postdoctoral training to date**




Patterns of variation in overall satisfaction are outlined in Appendix 11. Most notably, satisfaction declines as a respondent's tenure as a postdoc increases—respondents in their first appointment are more satisfied than those in their second, third or higher appointments (mean satisfaction of 3.74 vs. 3.57 and 3.43, respectively). In addition, postdocs outside of Canada are more satisfied than those within Canada. A perception that postdocs are better treated abroad, particularly in Europe, is also evident in the responses to open-ended questions.

To better understand how the postdoctoral experience can be improved, respondents were asked to rate their satisfaction with specific aspects of their postdoctoral experience. Benefits, salary, and training opportunities are key sources of dissatisfaction for postdocs (Figure 27). Close to half of postdocs indicate that they are somewhat or very dissatisfied with the benefits available to them, over one-third are somewhat or very dissatisfied with their salary, and almost one-third are somewhat or very dissatisfied with postdoctoral training opportunities and career development. These aspects of postdoctoral administration and training have been developed in the preceding section of this report. Areas that postdocs tend to be most satisfied with are the level of supervision/independence, as well as the resources and facilities available to them.

**Figure 27: Satisfaction with elements of postdoctoral experience**[17]




Patterns of variation in respondents' satisfaction with different aspects of their postdoctoral experience are detailed in Appendix 12 and Appendix 13. Respondents in their first postdoctoral appointment are more satisfied with their funds for research and travel than those in their third or higher postdoc. Satisfaction with other specific aspects of postdoctoral experience tends to decline with the number of appointments held (consistent with overall satisfaction) but that pattern is not pronounced. Canadian immigrants tend to be less satisfied with most aspects of their postdoc experience than Canadian citizens or international postdocs on a work permit. Out-of-country postdocs are more satisfied than postdocs at institutions in Canada with many aspects of the appointments. There are also specific regional differences within Canada and differences among postdocs from different research disciplines.

[17] Mean scores are calculated using a 5-point scale in which 1=Completely dissatisfied and 5=Completely satisfied.

## Looking Forward

Though experts in their fields, postdocs are at the beginning of their careers. They are Canada's promising new researchers. However, while the majority of postdocs are pleased with their research environments, many are uncertain about how they will meet their ultimate career goals.

The survey depicts a continuing administrative ambiguity around the status of postdocs, with serious consequences for compensation and benefits. Most respondents to the 2013 survey would prefer to be administered as employees, a finding that may be related to the 2010 Canada Revenue Agency clarification of postdoc taxation status.

In addition to the need for clarity and consistency in administrative status, postdocs need better career training options. More than one-third of postdocs report that they have not received any formal or informal training, career counselling or skills development. Postdocs recognize the need to explore career options outside of academia and want access to the career development opportunities necessary to be successful in a broad range of careers.

Canada has a tremendous opportunity to build on the research excellence that postdocs represent. Postdocs are working across Canada in a diverse array of fields performing important scholarship. They are an integral part of the Canadian research workforce. The results of the 2013 Canadian Postdoc Survey inspire us to think imaginatively about how to provide a more beneficial and productive environment for Canada's early career researchers.

***Canadian postdocs represent an invaluable resource to the country's research excellence and overall economic success.***

## References

Adamo, S.A. 2013. Attrition of women in the biological sciences: workload, motherhood, and other explanations revisited. BioScience 63:43–48.

Black, G.C., and Stephan, P.E. 2010. The economics of university science and the role of foreign graduate students and postdoctoral scholars. *In* American Universities in a Global Market, *Ed.* C.T. Clotfelter. Univ. Chicago Press, Chicago. pp.129–161.

Canadian Union of Public Employees v Governing Council of the University of Toronto, 2012 CanLII 1673 (ON LRB). (7 August 2013; http://canlii.ca/t/fpptr)

[CAPS-ACSP] Canadian Association of Postdoctoral Scholars - Association Canadienne des Stagiaires Post-doctoraux. 2009. A Postdoctoral Crisis in Canada: From the 'Ivory Tower' to the Academic 'Parking Lot.' (7 August 2013; http://sites.google.com/site/canadapostdoc/Home/CAPSSurvey2009Final.pdf)

[CAPS-ACSP] Canadian Association of Postdoctoral Scholars - Association Canadienne des Stagiaires Post-doctoraux. 2010. CAPS Governance Documents / Documents de Gouvernance de l'ACSP. (7 August 2013; http://www.caps-acsp.ca/caps-governance-documents)

Davis, G. 2005. Doctors without orders. American Scientist 93(3, supplement). (7 August 2013; http://postdoc.sigmaxi.org/results)

Davis, G. 2009. Improving the postdoctoral experience: an empirical approach. *In* Science and Engineering Careers in the United States: an Analysis of Markets and Employment, *Eds* . R.B. Freeman and D.L. Goroff. Univ. Chicago Press, Chicago. pp. 99–127.

Desjardins, L. 2012. Profile and Labour Market Outcomes of Doctoral Graduates from Ontario Universities. Statistics Canada Catalogue no. 81-595-M098.Statistics Canada and Human Resources and Skills Development Canada, Ottawa 107 p. (18 September 2013; http://www.statcan.gc.ca/pub/81-595-m/81-595-m2012098-eng.pdf)

Dion, P. and Vézina, M. 2010. Emigration from Canada to the United States from 2000 to 2006. Canadian Social Trends 90:57–67. Statistics Canada Catalogue no. 11-008. (18 September 2013; http://www.statcan.gc.ca/pub/11-008-x/2010002/article/11287-eng.pdf)

Fuhrmann, C.N., Halme, D.G., O'Sullivan, P.S., and Lindstaedt, B. 2011. Improving graduate education to support a branching career pipeline: recommendations based on a survey of doctoral students in the basic biomedical sciences. CBE—Life Sciences Education 10:239–249.

Harmos, M. 2012. Background on PDFs in Canada. Paper presented at the 2012 Canadian Association of Postdoctoral Administrators Annual Meeting. (7 August 2013; http://postdoc.ca/docs/MihaelaHarmos.pdf)

Kreisworth, M. 2010. CAGS recommendations for postdoctoral fellows. Paper presented at the 2010 Canadian Association of Graduate Schools Annual Meeting. (4 July 2013; http://www.cags.ca/documents/conference/2010/CAGSpostdoc.KREISWIRTH.pdf;4 July 2013)

Maldonado, V., Wiggers, R., and Arnold, C. 2013. So You Want to Earn a PhD? The Attraction, Realities, and Outcomes of Pursuing a Doctorate. Toronto: Higher Education Quality Council of Ontario, Toronto. 37p. (18 September 2013; http://www.heqco.ca/SiteCollectionDocuments/At%20Issue%20Doctoral%20ENGLISH.pdf)

Martinez, E.D., Botos, J., Dohoney, K.M., Geiman, T.M., Kolla, S.S., Olivera, A., Qiu, Y., Rayasam, G.V., Stavreva, D.A., and Cohen-Fix, O. 2007. Falling off the academic bandwagon. EMBO Reports 8:977-981.

Marche, S. 2010. The shifting ground of postdoctoral fellowship policy and practice in Canada 2010. 34p.

McKenzie, M. 2007. Where are the scientists and engineers? Statistics Canada Working Paper Catalogue no. 88F0006XIE—No. 002, 47p. (18 September; http://www.statcan.gc.ca/pub/88f0006x/88f0006x2007002-eng.pdf)

Vogel, G. 1999. A Day in the Life of a Topflight Lab. Science 285:1531-1532.

# Appendices

**Appendix 1: Classification status by respondent characteristics (percent)**

| | | *n* | Employee | Trainee | Student | Independent contractor | Don't know | Other |
|---|---|---|---|---|---|---|---|---|
| **Postdoc location** | Canada | *1,762* | 35.9 | 26.3 | 11.0 | 7.0 | 6.6 | 13.3 |
| | Out-of-Country | *68* | 38.2 | 5.9 | 1.5 | 5.9 | 29.4 | 19.1 |
| **Region of residence** | Atlantic | *108* | 55.6 | 20.4 | 1.9 | 0.9 | 7.4 | 13.9 |
| | Quebec | *453* | 13.5 | 28.3 | 36.0 | 1.3 | 7.7 | 13.2 |
| | Ontario | *666* | 39.9 | 21.8 | 2.4 | 14.9 | 6.2 | 14.9 |
| | Prairies | *256* | 28.1 | 44.9 | 3.1 | 3.9 | 7.4 | 12.5 |
| | B.C. | *284* | 60.9 | 18.7 | 1.4 | 2.8 | 6.0 | 10.2 |
| **Field of research** | Life Sciences | *841* | 30.8 | 33.2 | 11.7 | 6.5 | 6.2 | 11.7 |
| | Physical Sciences /Engineering | *593* | 43.5 | 19.7 | 9.3 | 6.6 | 6.2 | 14.7 |
| | Social Sciences/Humanities | *250* | 32.8 | 16.8 | 10.4 | 8.4 | 13.2 | 18.4 |
| | Interdisciplinary | *146* | 40.4 | 19.9 | 10.3 | 8.9 | 9.6 | 11.0 |
| **Citizenship Status** | Canadian Citizen | *852* | 37.0 | 20.7 | 9.7 | 9.3 | 9.5 | 13.8 |
| | Permanent Resident /Landed Immigrant | *280* | 31.1 | 35.0 | 10.7 | 6.1 | 5.4 | 11.8 |
| | International Postdoc holding a work permit | *686* | 36.7 | 27.8 | 11.8 | 4.5 | 5.8 | 13.3 |

## Appendix 2: Tax forms received by classification (percent)

| | Postdocs at Canadian Institutions Only | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Receive only 1 tax form | | | | | | Receive 2 or more tax forms | | | | | |
| | Employee | Trainee | Student | Independent contractor | Don't know | Other | Employee | Trainee | Student | Independent contractor | Don't know | Other |
| **T4** | 63.1 | 23.2 | 7.4 | 15.0 | 17.5 | 24.7 | 90.2 | 83.3 | 63.3 | 63.6 | 67.9 | 84.2 |
| **T4A code 04 (Research grant)** | 7.3 | 19.1 | 11.0 | 33.6 | 13.1 | 12.4 | 36.6 | 42.4 | 20.0 | 45.5 | 42.9 | 42.1 |
| **T4A code 05 (Scholarship/ fellowship)** | 11.3 | 39.5 | 44.8 | 31.0 | 22.8 | 39.2 | 67.1 | 66.7 | 73.3 | 81.8 | 64.3 | 68.4 |
| **T4A Do not know code** | 0.9 | 2.0 | 1.8 | 0.9 | 1.0 | 5.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **T2202A** | 0.0 | 0.8 | 1.8 | 0.0 | 0.0 | 0.0 | 13.4 | 15.2 | 46.7 | 9.1 | 25.0 | 5.3 |
| **None (Independent contractor)** | 0.2 | 0.5 | 1.2 | 4.4 | 1.9 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **None (Foreign scholarship)** | 1.1 | 1.3 | 5.5 | 0.0 | 5.3 | 4.1 | 0.0 | 1.5 | 3.3 | 0.0 | 3.6 | 5.3 |
| **Don't know** | 16.2 | 13.6 | 26.4 | 15.0 | 38.3 | 13.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**Appendix 3: Preferred classification by respondent characteristics (Total preferences calculated excluding "don't know")**

| | | *n* | Employee | Student | Independent contractor | Trainee | Other | Other: PDF | *Don't know* |
|---|---|---|---|---|---|---|---|---|---|
| **Postdoc location** | Canada | *1,762* | 76.2 | 7.6 | 2.6 | 8.4 | 3.1 | 2.1 | *26.1* |
| | Out-of-country | *68* | 55.3 | 8.5 | 4.3 | 8.5 | 17.0 | 6.4 | *30.9* |
| **Region of residence** | Atlantic | *108* | 74.7 | 4.0 | 1.3 | 8.0 | 4.0 | 8.0 | *30.6* |
| | Quebec | *453* | 60.9 | 18.2 | 3.4 | 10.2 | 4.9 | 2.5 | *28.3* |
| | Ontario | *666* | 81.5 | 4.1 | 3.7 | 8.1 | 1.4 | 1.2 | *23.6* |
| | Prairies | *256* | 81.7 | 3.1 | 1.6 | 9.4 | 3.1 | 1.0 | *25.4* |
| | B.C. | *284* | 81.5 | 4.9 | 0.0 | 5.4 | 4.9 | 3.4 | *27.8* |
| **Field of Research** | Life Sciences | *841* | 73.8 | 7.6 | 2.4 | 11.1 | 3.7 | 1.4 | *26.2* |
| | Physical Sciences/Engineering | *593* | 81.6 | 6.5 | 2.2 | 5.2 | 2.5 | 2.0 | *25.0* |
| | Social Sciences/Humanities | *250* | 70.5 | 9.7 | 5.1 | 4.5 | 5.1 | 5.1 | *29.6* |
| | Interdisciplinary | *146* | 68.2 | 9.3 | 1.9 | 12.1 | 5.6 | 2.8 | *26.7* |

**Appendix 4: Mean gross annual salary by respondent characteristics**

| | | *n* | Mean ($) |
|---|---|---|---|
| **All respondents who provided their salary** | | *1,802* | 43,972.88 |
| **Number of postdoc appointments** | One | *1,250* | 43,505.51 |
| | Two | *450* | 45,405.07 |
| | Three or more | *102* | 43,381.88 |
| **Gender** | Female | *819* | 43,552.63 |
| | Male | *958* | 44,349.72 |
| **Location of postdoc appointment** | Canada | *1,736* | 43,966.97 |
| | Out-of-country | *66* | 44,128.30 |
| **Region of residence** | Atlantic | *107* | 43,714.45 |
| | Quebec | *447* | 41,492.81 |
| | Ontario | *654* | 44,552.27 |
| | Prairies | *251* | 45,039.35 |
| | B.C. | *282* | 45,442.77 |
| **Field of research** | Life Sciences | *832* | 44,143.14 |
| | Physical Sciences/Engineering | *582* | 44,445.39 |
| | Social Sciences/Humanities | *245* | 41,611.78 |
| | Interdisciplinary | *143* | 45,104.40 |
| **Primary Source of Funding** | Supervisor's research grant | *878* | 42,567.85 |
| | CIHR/NSERC/SSHRC fellowship | *359* | 46,865.80 |
| | Private foundation/association | *107* | 47,172.41 |
| | Mitacs fellowship | *110* | 44,022.25 |
| | Provincial government or provincial research council | *102* | 43,602.46 |
| | Institutional/departmental training grant | *77* | 44,090.43 |
| | Foreign government or entity | *40* | 41,874.55 |
| | Other | *129* | 45,569.15 |

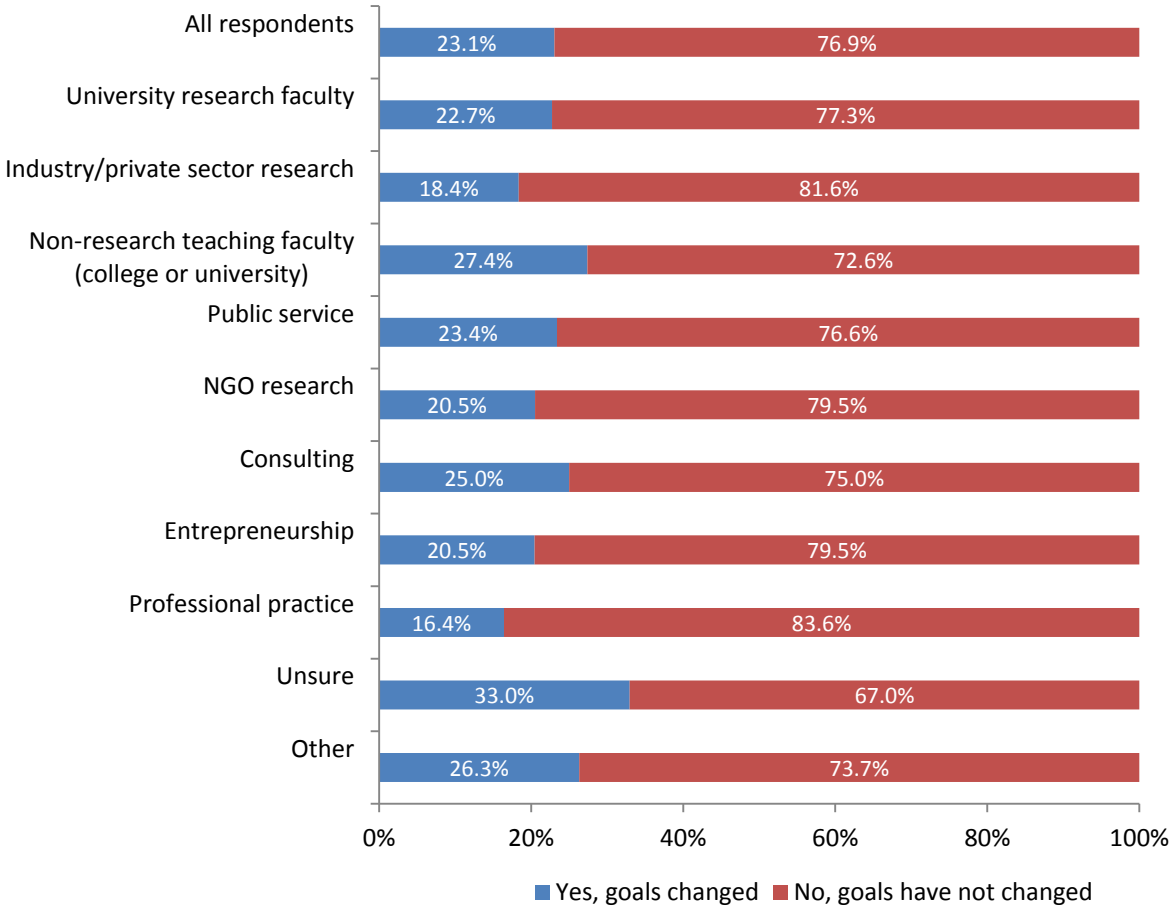
**Appendix 5: Sponsors of employer portion of EI and CPP premiums and extended health plan premiums (percent)**

| | EI/CPP (n=472) | Health plan (multiple response) (n=1,242) |
|---|---|---|
| **Postdoc** | 15.3 | 43.6 |
| **Advisor** | 19.5 | 22.6 |
| **Institution** | 21.6 | 18.9 |
| **Other** | 1.7 | 5.7 |
| **Don't know** | 41.9 | 16.3 |

**Appendix 6: Career goals before beginning postdoc and change in goals by field of research (percent)**

| | | Life Sciences | Physical Sciences /Engineering | Social Sciences /Humanities | Interdisciplinary |
|---|---|---|---|---|---|
| *n* | | *841* | *593* | *250* | *146* |
| **Career goals before beginning postdoctoral position** | **University research faculty** | 79.1 | 78.9 | 91.6 | 76.0 |
| | **Industry/private sector research** | 23.7 | 31.0 | 4.4 | 39.7 |
| | **Non-research teaching faculty (college or university)** | 11.2 | 9.4 | 14.4 | 15.1 |
| | **Public service** | 8.7 | 6.6 | 6.8 | 8.2 |
| | **NGO research** | 7.8 | 3.4 | 6.0 | 11.0 |
| | **Consulting** | 4.0 | 8.6 | 6.4 | 10.3 |
| | **Entrepreneurship** | 3.1 | 7.3 | 1.2 | 11.0 |
| | **Professional practice (e.g., medicine, law, social work, etc.)** | 4.8 | 1.7 | 4.8 | 3.4 |
| | **Unsure** | 6.3 | 3.2 | 2.8 | 6.2 |
| | **Other** | 1.1 | 1.0 | 1.6 | 0.0 |
| **Have your goals changed since you began your postdoctoral position?** | **Yes** | 26.2 | 20.2 | 18.0 | 25.3 |
| | **No** | 73.8 | 79.8 | 82.0 | 74.7 |

**Appendix 7: Change of goals for respondents with different original career goals**



**Appendix 8: Formal training received by field of research (percent)**

| | Life Sciences | Physical Sciences/ Engineering | Social Sciences/ Humanities | Interdisciplinary |
|---|---|---|---|---|
| *n* | *841* | *593* | *250* | *146* |
| **Career development** | 19.1 | 17.5 | 12.8 | 20.5 |
| **Research ethics** | 18.9 | 10.8 | 11.2 | 15.8 |
| **Presentation skills** | 12.5 | 11.1 | 7.6 | 11.6 |
| **Grant or proposal writing** | 11.5 | 9.6 | 8.8 | 12.3 |
| **Teaching skills** | 11.4 | 14.8 | 13.6 | 17.1 |
| **Project management** | 10.0 | 10.6 | 4.4 | 10.3 |
| **Writing skills** | 9.2 | 8.4 | 5.2 | 9.6 |
| **Intellectual property** | 7.5 | 6.6 | 2.8 | 10.3 |
| **English language skills** | 5.6 | 5.6 | 3.2 | 1.4 |
| **Group or lab management** | 5.4 | 7.3 | 3.6 | 5.5 |
| **Conflict resolution skills** | 4.0 | 5.4 | 1.2 | 6.8 |
| **French language skills** | 3.4 | 1.7 | 3.2 | 2.1 |
| **Negotiating skills** | 3.0 | 4.9 | 2.8 | 2.1 |

**Appendix 9: Interest in formal professional development training by field of research (percent)**

| | Life Sciences | Physical Sciences/Engineering | Social Sciences/Humanities | Interdisciplinary |
|---|---|---|---|---|
| *n* | *841* | *593* | *250* | *146* |
| **Grant or proposal writing** | 69.8 | 61.6 | 70.8 | 70.5 |
| **Project management** | 51.6 | 46.4 | 36.8 | 58.2 |
| **Career development** | 49.5 | 43.5 | 53.2 | 40.4 |
| **Teaching skills** | 41.9 | 40.5 | 44.8 | 30.1 |
| **Group or lab management** | 47.8 | 28.7 | 16.4 | 43.8 |
| **Negotiating skills** | 28.7 | 27.8 | 23.2 | 37.7 |
| **Writing skills** | 26.9 | 24.8 | 26.0 | 20.5 |
| **Intellectual property** | 20.8 | 19.7 | 14.4 | 27.4 |
| **Presentation skills** | 14.3 | 20.9 | 15.2 | 15.1 |
| **Conflict resolution skills** | 18.4 | 15.0 | 10.8 | 17.8 |
| **English language skills** | 12.7 | 18.0 | 9.6 | 13.0 |
| **French language skills** | 10.6 | 12.8 | 18.4 | 13.0 |
| **Research ethics** | 7.4 | 9.3 | 8.0 | 5.5 |
| **None** | 3.0 | 6.1 | 5.6 | 2.7 |

**Appendix 10: Satisfaction with career options by respondent characteristics**

| | | *n* | % Satisfied |
|---|---|---|---|
| **Overall** | | | 43.9 |
| **Field of research** | **Life Sciences** | *841* | 38.8 |
| | **Physical Sciences/Engineering** | *593* | 54.0 |
| | **Social Sciences/Humanities** | *250* | 35.2 |
| | **Interdisciplinary** | *146* | 47.3 |
| **Region of residence** | **Atlantic** | *108* | 46.3 |
| | **Quebec** | *453* | 44.4 |
| | **Ontario** | *666* | 43.7 |
| | **Prairies** | *256* | 43.4 |
| | **B.C.** | *284* | 41.5 |
| **Location of Postdoctoral Appointment** | **Canada** | *1,762* | 43.9 |
| | **Out-of-country** | *68* | 44.1 |
| **Gender** | **Female** | *839* | 38.4 |
| | **Male** | *963* | 48.9 |
| **Citizenship Status** | **Canadian citizen** | *852* | 35.7 |
| | **Permanent res./landed immigrant** | *280* | 40.0 |
| | **Int. postdoc holding work permit** | *686* | 55.5 |

**Appendix 11: Overall satisfaction by respondent characteristics**

| | | *n* | Mean |
|---|---|---|---|
| **Region of residence** | **Atlantic** | *108* | 3.79 |
| | **Quebec** | *453* | 3.69 |
| | **Ontario** | *666* | 3.66 |
| | **Prairies** | *256* | 3.70 |
| | **B.C.** | *284* | 3.56 |
| **Location of postdoc appointment** | **Canada** | *1,762* | 3.66 |
| | **Out of country** | *68* | 4.04 |
| **Field of research** | **Life Sciences** | *841* | 3.66 |
| | **Physical Sciences / Engineering** | *593* | 3.71 |
| | **Social Sciences / Humanities** | *250* | 3.70 |
| | **Interdisciplinary** | *146* | 3.61 |
| **Citizenship status** | **Canadian citizen** | *852* | 3.68 |
| | **Permanent res. / landed immigrant** | *280* | 3.52 |
| | **Int. postdoc holding work permit** | *686* | 3.75 |
| **Number of appointments held** | **One** | *1,265* | 3.74 |
| | **Two** | *461* | 3.57 |
| | **Three or more** | *104* | 3.43 |

**Appendix 12: Satisfaction with elements of postdoctoral training I: by citizenship and number of postdoctoral appointments (mean score)**

| | Citizenship Status | | | Number of Appointments Held | | |
|---|---|---|---|---|---|---|
| | **Canadian citizen** | **Permanent resident/landed immigrant** | **International postdoc holding a work permit** | **One** | **Two** | **Three or more** |
| *n* | *852* | *280* | *686* | *1265* | *461* | *104* |
| **Salary** | 3.15 | 2.63 | 3.12 | 3.09 | 3.01 | 2.84 |
| **Benefits** | 2.57 | 2.35 | 2.80 | 2.66 | 2.56 | 2.39 |
| **Opportunities for research collaboration** | 3.75 | 3.33 | 3.59 | 3.62 | 3.62 | 3.63 |
| **Resources and facilities** | 3.88 | 3.75 | 3.84 | 3.88 | 3.78 | 3.68 |
| **Funds for research and travel** | 3.46 | 3.23 | 3.45 | 3.48 | 3.34 | 3.05 |
| **Career development** | 3.12 | 2.90 | 3.24 | 3.17 | 3.03 | 3.01 |
| **Professional training opportunities** | 3.04 | 2.89 | 3.12 | 3.08 | 3.01 | 2.87 |
| **Work environment /peer interaction** | 3.80 | 3.71 | 3.76 | 3.81 | 3.68 | 3.72 |
| **Level of supervision /independence** | 4.11 | 3.86 | 4.04 | 4.07 | 3.94 | 4.06 |
| **Work/life balance** | 3.59 | 3.40 | 3.55 | 3.57 | 3.49 | 3.42 |

**Appendix 13: Satisfaction with elements of postdoctoral training II: by region, postdoc location, and field of research (mean scores)[18]**

| | Region of Residence | | | | | Postdoc Location | | Field of Research | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Atlantic | Quebec | Ontario | Prairies | B.C. | Canada | Out-of-Country | Life Sci. | Phys. Sci./Eng. | Soc.Sci./Hum. | Interdisc. |
| ***n*** | *108* | *453* | *666* | *256* | *284* | *1762* | *68* | *841* | *593* | *250* | *146* |
| **Salary** | 3.07 | 3.22 | 3.03 | 3.00 | 2.79 | 3.04 | 3.40 | 2.93 | 3.16 | 3.12 | 3.25 |
| **Benefits** | 2.61 | 2.53 | 2.45 | 2.61 | 3.15 | 2.62 | 2.56 | 2.53 | 2.73 | 2.55 | 2.80 |
| **Opportunities for research collaboration** | 3.57 | 3.53 | 3.70 | 3.57 | 3.54 | 3.60 | 4.10 | 3.69 | 3.53 | 3.52 | 3.74 |
| **Resources and facilities** | 3.67 | 3.72 | 3.92 | 3.87 | 3.82 | 3.83 | 4.19 | 3.90 | 3.78 | 3.73 | 4.01 |
| **Funds for research and travel** | 3.45 | 3.32 | 3.46 | 3.50 | 3.36 | 3.41 | 3.53 | 3.47 | 3.44 | 3.17 | 3.49 |
| **Career development** | 3.23 | 3.13 | 3.06 | 3.15 | 3.08 | 3.10 | 3.72 | 3.08 | 3.15 | 3.10 | 3.29 |
| **Professional training opportunities** | 3.00 | 2.91 | 3.08 | 3.07 | 3.10 | 3.03 | 3.41 | 3.03 | 3.07 | 2.96 | 3.25 |
| **Work environment /peer interaction** | 4.02 | 3.71 | 3.78 | 3.75 | 3.70 | 3.76 | 4.13 | 3.87 | 3.69 | 3.57 | 3.88 |
| **Level of supervision /independence** | 4.25 | 3.96 | 4.10 | 4.09 | 3.83 | 4.03 | 4.29 | 4.04 | 4.02 | 3.98 | 4.18 |
| **Work/life balance** | 3.76 | 3.56 | 3.46 | 3.52 | 3.62 | 3.54 | 3.56 | 3.49 | 3.59 | 3.61 | 3.53 |

[18] Mean scores are calculated using a 5-point scale in which 1=Completely dissatisfied and 5=Completely satisfied.